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## Paper-6A

# Financial Management




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**AIR 5**



Sarthak Aggarwal  
CA Inter May-23

**AIR 19**



Aman Mahajan  
CA Inter Dec-21

**AIR 33**



Sundar B  
CA Inter Dec-21

**AIR 49**



Ria Gupta  
CA Inter May-22

# What Our Students have to Say....

## **Aman Mahajan (CA AIR 19)**

I really liked your classes, especially the practical linkages explained with amazing graphics. The full subject test series helped a lot in improving my writing speed and presentation skills.

## **Sundar Sri Renganathan B (AIR 33)**

I took Accounting from IndigoLearn and the classes were really good. They emphasized on conceptual clarity over getting things done quickly, which is really vital to score good marks in practical papers. Other resources like Notes, Quizzes and Forum was beneficial too.

## **Dwarakesh**

Thank you IndigoLearn team for the guidance and support throughout the past few months. I had great conceptual clarity in all the subjects and the revision classes by Suraj Sir were very helpful. Study planner and Free resources were very useful. Thank you Team IndigoLearn.

## **Yug Manoj Kumar Bhattad**

I have cleared my CA Foundation examination with the total of 286. And this was not possible without the efforts and support of IndigoLearn. The way of teaching with utmost conceptual clarity is the best thing at IndigoLearn.

## **Prakash Bhatt**

Superb, one stop solution for All CA and Accountancy students they serve real Education at very very reasonable price

## **Naveen Kumar S**

Good experience, unlimited views helped a lot in last one month preparation. Looking forward for

## **Bhagyasree Chougule**

It was only because of IndigoLearn that my concepts became very clear, and I was able to crack the exam. I wasn't 100% prepared I needed more practice but luckily I got through. I'm definitely choosing IndigoLearn for group 2 preparation. A big thanks!

## **Mohd Thayyab**

Theoretical subjects made easier through story based examples and charts. Concept clarity 100%. Fully exam+practical oriented classes will help not only to retain the concepts during exams but for the longer duration.

## **Lalit Chetan Sanpal**

IndigoLearn has been fantastic and brilliant. Helped me a lot in my preparations. I cleared both the groups in first attempt with your brilliant classes and notes. Thanks to all the faculties, coordinators, forum admins and everyone at IndigoLearn. Really grateful. Will go for CA Finals at IndigoLearn For sure. Thank you so much IndigoLearn.

# #StudentFirst

## Abishek M

I'd like to thank IndigoLearn for all the support they've provided me with. Modules were great. They were time saving and straight to the point. I extensively used the materials provided before exams, they were so helpful. Also I'd appreciate them for providing unlimited views as I kept looking into the maths modules till the end.

## Munnur Nandini Sree

Accounting classes I have taken from IndigoLearn. Now I feel that it's a great choice that I have made (after seeing my result ) because only in Accounting I got exemption. Thank you IndigoLearn.

## Harshita G

Thank u so much IndigoLearn for your guidance. This is only possible because of u people.... For my finals also my journey will continue with IndigoLearn.

## Bharathsha PS

I purchased Economics, IT, FM, EIS and Audit from IndigoLearn. All your classes are superb and anyone can easily crack the CA exams. What makes u special is your classes help us to understand the concepts very well. Special thanks to the FM faculty, I studied only 2 chapters in economics, and still managed to score exemption in the 8th paper.

## Nayi Mihir kumar

This platform is very helpful in all activity like mcq practise, notes, teaching activities, revisions and the forum interaction with all students which I like the most. If anybody want to clear their exams in first attempt then IndigoLearn is the best platform for them. My all regards to IndigoLearn. Thank you so much.

## Rajalaxmi CA Inter

Can't believe I cleared. Sathya Sir, Suraj Sir, Yogita Mam ... thanks to all my faculties. Basically an Eng student with zero accounts knowledge. Thanks IndigoLearn for making me clear in first attempt.

## Priyanka Udeshi

All the faculties have excellent knowledge of the subject and deliver it in very crisp & effective manner. Also, quick response at Forums never let any of my doubts go unresolved no matter how small they were. Thank you once again to all the teachers & staff at IndigoLearn!

## Naveen Kumar T

It been a great journey with indigo learn team. Thanks to all the facilities and forum friends who support me a lot.

## **Disclaimer**

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**CA Inter - Paper 8A: Financial Management (60 marks)**

**CHAPTER WISE WEIGHTAGE BASED ON PAST EXAM ANALYSIS**

S. No.	CHAPTER NAME	May-23	Nov-22	May-22	Dec-21	Jul-21	Jan-21	Nov-20	May-19	Nov-18	May-18	Avg. of category	ICAI Weightage
<b>I Financial Management &amp; Analysis</b>													
1	Scope & Objective	-	-	2*	2*	2*	4	4	-	2	2*	8.5 Marks	6 - 9 marks
3	Ratio Analysis	10	5	5	10	10	5	5	5	9	5		
	<b>TOTAL</b>	<b>10</b>	<b>5</b>	<b>7</b>	<b>12</b>	<b>12</b>	<b>9</b>	<b>9</b>	<b>5</b>	<b>11</b>	<b>7</b>		
<b>II Financial Decisions</b>													
2	Sources of Finance	6	4	2	4	8	2*	4	4	4	6	28.5 Marks	24 - 27 marks
4	Cost of Capital	10	11	10	5	10	10	5	5	0	0		
5	Capital Structure Theories & Decisions	12	8*	10	10	5	10	10	10	15	10		
6	Leverages	5	10	10	10	10	10	10	10	6	5		
	<b>TOTAL</b>	<b>33</b>	<b>31</b>	<b>32</b>	<b>29</b>	<b>33</b>	<b>32</b>	<b>29</b>	<b>29</b>	<b>25</b>	<b>21</b>		
<b>III Capital Investment &amp; dividend decisions</b>													
7	Investment Decisions	10	20	19	8	12*	12*	7*	14	12*	20	24.7 Marks	18 - 21 marks
8	Risk Adjusted Capital Budgeting Decision	5	5	-	8*	5	5	12*	9	7	12		
9	Dividend Decisions	5	5	4	5	5	5	5	5	5	0		
	<b>TOTAL</b>	<b>20</b>	<b>25</b>	<b>23</b>	<b>21</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>28</b>	<b>24</b>	<b>32</b>		
<b>III Management of Working Capital</b>													
10	(i) Introduction	-	-	-	-	-	-	-	-	-	-	9.3 Marks	6 - 9 marks
	(ii) Treasury & Cash	-	9	-	5	-	4	-	-	-	-		
	(iii) Inventory	-	-	5	-	-	-	-	-	-	-		
	(iv) Receivables	5	-	-	5	5	-	-	-	10	-		
	(v) Payables	-	-	-	-	-	-	-	-	-	-		
	(vi) Financing Working capital	4	-	5	-	-	5	10	10	-	10		
	<b>TOTAL</b>	<b>9</b>	<b>9</b>	<b>10</b>	<b>10</b>	<b>5</b>	<b>9</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>		

\* Figures adjusted for internal choice in Ques 6(c)

NOTE: Weightage of Optional questions has been taken in calculations



**CA Inter - Paper 8A: Financial Management (60 marks)**

**QUESTION WISE TOPICS BASED ON PAST EXAM PATTERN**

Ques. No.	May-23		Nov-22		May-22		Dec-21		Jul-21	
	TOPIC	M	TOPIC	M	TOPIC	M	TOPIC	M	TOPIC	M
<b>COMPULSORY</b>										
1(a)	Dividend Decision	5	Cash Management	5	Ratio Analysis	5	Receivables Management	5	Receivables Management	5
1(b)	Management of Receivables	5	Ratio Analysis	5	Financing of Working Capital	5	Cost of Capital	5	Capital Structure Theories	5
1(c)	Risk Analysis in Capital Budgeting	5	Cost of Capital	5	Inventory Management	5	Dividend Decision	5	Risk Adjusted Capital Budgeting	5
1(d)	Leverages	5	Risk Analysis in Capital Budgeting	5	Investment Decisions	5	Cash Budgeting	5	Dividend Decision	5
<b>OPTIONAL (3 of 4)</b>										
2	Ratio Analysis	10	Leverages	10	Leverages	10	Ratio Analysis	10	Cost of Capital	10
3	Capital Structure Decisions	10	Investment Decisions	10	Investment Decisions	10	Capital Structure Decisions	10	Ratio Analysis	10
4	Cost of Capital	10	Investment Decisions	10	Capital Structure Decisions	10	Investment Decisions & Sensitivity	10	Investment Decisions	10
5	Capital Budgeting Decisions	10	(a) Capital Structure Theories (b) Cost of capital	4 6	Cost of Capital	10	Leverages	10	Leverages	10
6(a)	Sources of Finance	4	Sources of Finance	4	Investment Decisions	4	Sources of Finance	4	Sources of Finance	4
6(b)	Working Capital Management	4	Treasury Management	4	Dividend Decisions	4	Risk Adjusted Capital Budgeting	4	Sources of Finance	4
6(c)	Capital Structure Theories	2	Capital Structure	2	Scope & Objective	2	Scope & Objective	2	Scope & Objective	2
OR	Sources of Finance	2	Capital Structure	2	Sources of Finance	2	Risk Adjusted Capital Budgeting	2	Investment Decisions	2

**CA Inter - Paper 8A: Financial Management (60 marks)**

**QUESTION WISE TOPICS BASED ON PAST EXAM PATTERN**

Ques. No.	Jan-21		Nov-20		Nov-19		May-19		Nov-18		May-18	
	TOPIC	M	TOPIC	M	TOPIC	M	TOPIC	M	TOPIC	M	TOPIC	M
<b>COMPULSORY</b>												
1(a)	Ratio Analysis	5	Ratio Analysis	5	Ratio Analysis	5	Ratio Analysis	5	Capital Structure Decisions	5	Capital Structure Theories	5
1(b)	Dividend Decision	5	Investment Decisions	5	Risk Adjusted Capital Budgeting	5	Cost of Capital	5	Dividend Decision	5	Leverages	5
1(c)	Risk Adjusted Capital Budgeting	5	Dividend Decision	5	Dividend Decision	5	Risk Adjusted Capital Budgeting	5	Ratio Analysis	5	Ratio Analysis	5
1(d)	Financing Working capital	5	Cost of Capital	5	Investment Decisions	5	Dividend Decision	5	Risk Adjusted Capital Budgeting	5	Capital Structure Decisions	5
<b>OPTIONAL (3 of 4)</b>												
2	Leverages	10	Financing Working capital	10	Leverages	10	Capital Structure Decisions	10	Ratio Analysis & Leverages	10	Risk Adjusted Cap Bud & Sources of Fin	10
3	Capital Structure Theories	10	Capital Structure Decisions	10	Cash Budgeting	10	Investment Decisions	10	Investment Decisions	10	Investment Decisions	10
4	Cost of Capital	10	Risk Adjusted Capital Budgeting	10	Investment Decisions	10	Leverages	10	Receivables Management	10	Investment Decisions	10
5	Investment Decisions	10	Leverages	10	Cost of Capital	10	Financing Working capital	10	Capital Structure Theories	10	Financing Working capital	10
6(a)	Scope & Objective	4	Scope & Objective	4	Scope & Objective	3	Risk Adjusted Capital Budgeting	4	Sources of Finance	4	Sources of Finance	4
6(b)	Treasury Management	4	Sources of Finance	4	Risk Adjusted Capital Budgeting	3	Sources of Finance	4	Investment Decisions	4	Risk Adjusted Capital Budgeting	4
6(c)	Investment Decisions	2	Investment Decisions	2	Cost of Capital	4	Investment Decisions	2	Scope & Objective	2	Scope & Objective	2
OR	Sources of Finance	2	Risk Adjusted Capital Budgeting	2	Sources of Finance	4	Investment Decisions	2	Risk Adjusted Capital Budgeting	2	Scope & Objective	2

<b>Index</b>	<b>Page No.</b>
Chapter 1: Scope and Objectives of Financial Management	1
Chapter 2: Types of Financing	13
Chapter 3: Financial Analysis and Planning - Ratio Analysis	45
Chapter 4: Cost of Capital	84
Chapter 5: Financing Decisions - Capital Structure	109
Chapter 6: Financing Decisions – Leverages	137
Chapter 7: Investment Decisions	156
Chapter 8: Dividend Decisions	190
Chapter 9: Management of Working Capital	
▪ Introduction to Working Capital Management	210
▪ Treasury and Cash Management	222
▪ Management of Receivables	231
▪ Management of Payables (Creditors)	241
▪ Financing of Working Capital	242
▪ Illustrations	245

# CHAPTER 1

## SCOPE AND OBJECTIVES OF FINANCIAL MANAGEMENT

### 1. Introduction

Financial management is concerned with efficient acquisition and allocation of funds with an objective to make profit or dividend for owners. Major financial decision areas namely:

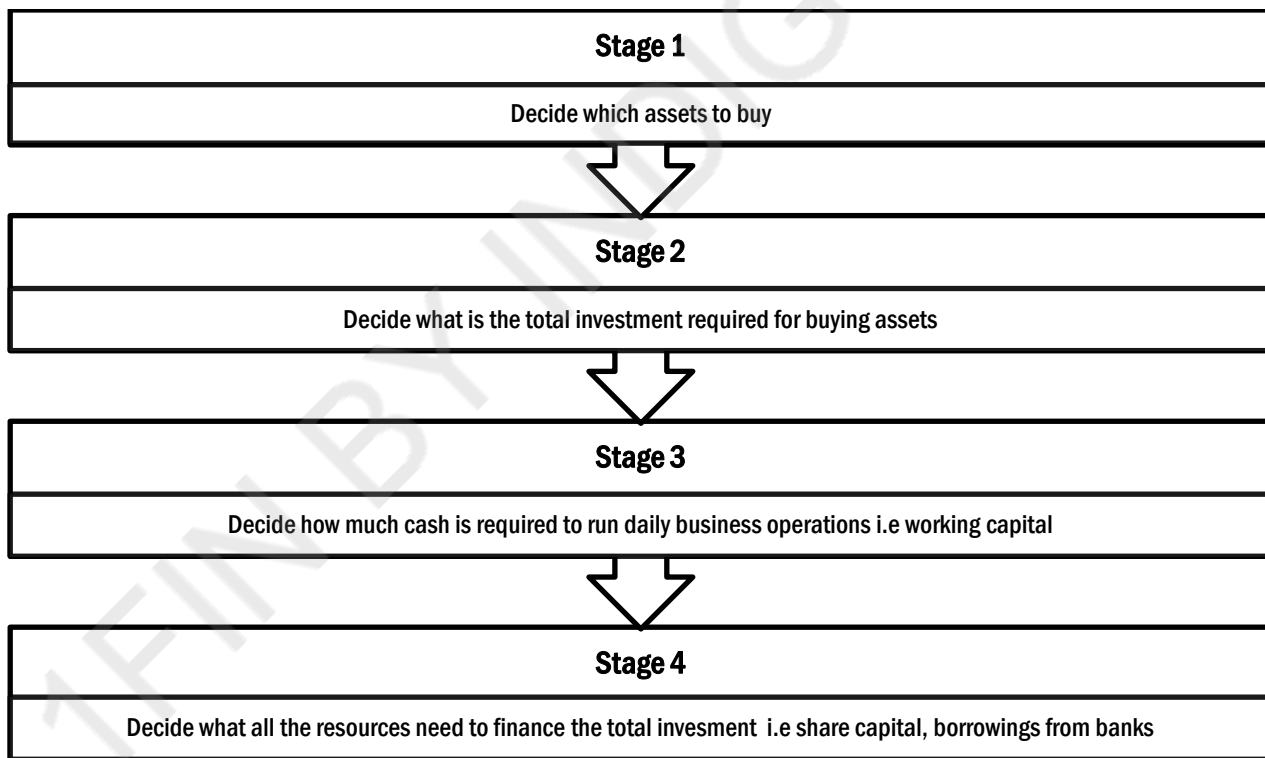
Investment decisions - where to invest the money?

financing decisions - where to get the money from?

dividend decisions - How much to distribute among shareholders to keep them satisfied?

#### 1.1 Stages of decision making:

Every entrepreneur can go through the following decision making:



#### 2. Meaning of financial management:

Financial management is that managerial activity which is concerned with "**planning and controlling of the firm's financial resources**".

### 3. Definitions

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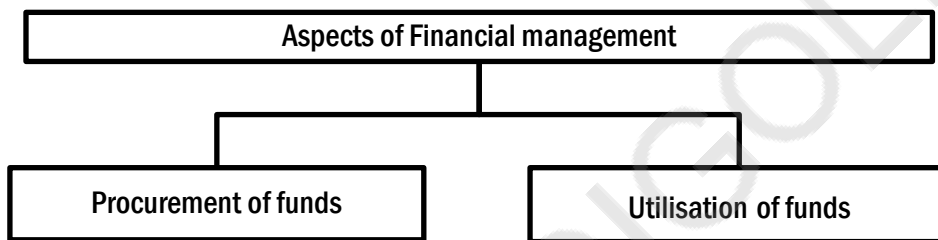
Financial Management comprises of

- Forecasting,
- Planning,
- Organizing,
- Directing,
- Co - coordinating and
- Controlling

of all activities relating to acquisition and application of the financial resources of an undertaking in keeping with its financial objective

#### **Definition given by Phillipatus:**

Financial Management is concerned with the managerial decisions that result in the acquisition and financing of short term and long-term credits for the firm.



### 4. Procurement of funds:

---

The complex problem of every business is funds procurement; the following are some of the sources of funds.

- Owner's funds/equity
- Loans from commercial banks
- Venture capital or international funding
- Angel financing
- Debentures
- Bonds

#### 4.1 Equity

- From the risk point of view, the issue of equity shares is the best as there is no repayment of equity capital except at the time of liquidation.
- From the cost point of view, the equity funds are most expensive as the expected dividend distribution rate is higher than the interest rate prevalent in the market.
- Issue of new equity share holders may dilute the control of existing shareholders.

#### 4.2 Debentures

- Because of tax advantage, these are cheaper than shares i.e unlike dividend, here interest is tax free.
- Unlike dividend, the interest must be paid even in the hard times of the business i.e interest must be paid whether or not company earns profits or not.
- Risk is higher.

#### 4.3 Funding from banks:

- Banks play vital role in meeting not only the daily needs of the business but also the long term needs of the business.

- Lending services of the banks are fund and non fund based
- Fund based lending services: cash credit, over draft, term loans, working capital, bill purchase/discounting
- Non Fund based lending services: guarantee and letter of credit.

#### 4.4 International funding:

- With the advent of liberalization, globalization business organizations can raise funds from international sources.
- Foreign direct investment (FDI), foreign institutional investors (FII) is two major sources of raising funds from foreign sources.

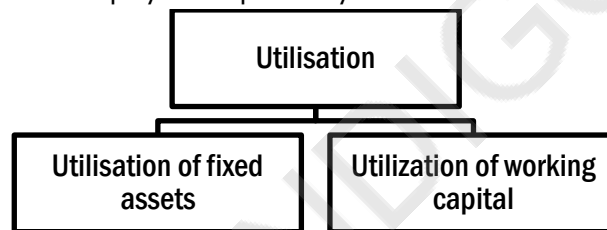
#### 4.5 Angel financing:

- It is a form of equity financing here the angel investor is wealthy individual who provides capital for startups or expansion and they need higher return than the return on traditional investments.

### 5. Effective utilization of funds:

---

If the procured funds are not utilized properly then there is no point of running business in successful manner. So it is very crucial to employ funds profitably.

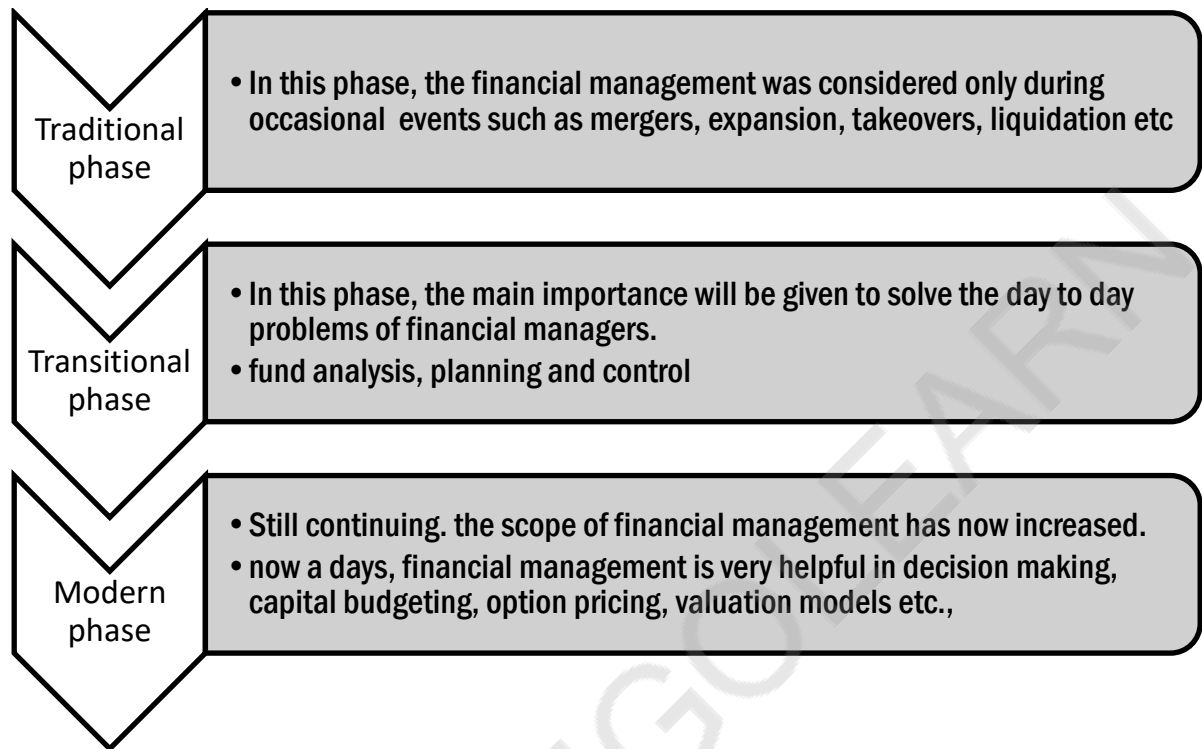


- Utilization for fixed assets:  
Funds need to be invested in fixed assets in the manner in which the company can produce optimum level
- Utilization of working capital:  
The finance manager must also keep in view that there must be sufficient funds in the working capital like inventories, book debts, cash etc,. the company do not keep too much funds blocked in the working capital.

### 6. Evolution of financial management

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The following are the 3 important phases for financial management.



## 7. Finance functions/decisions:

Value of the firm can be expressed as follows.

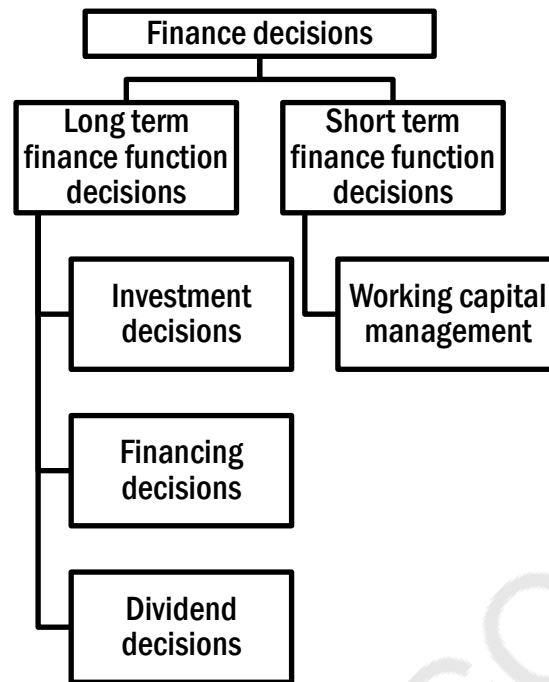
$$V = f(I, F, D)$$

Where,

I = Investment decisions

F = Financing decisions

D = Dividend decisions



(a) Investment decisions:

- These decisions involve selection of assets in which funds will be invested by a firm after careful assessment through capital budgeting.
- Long term funds are used for fixed assets, asset management policies are to be laid down for current assets.

(b) Financing decisions:

- These decisions relate to acquiring the optimum finance to meet financial objectives and seeing that fixed and working capital are effectively managed.
- The financial manager needs to possess a good knowledge of the sources of available funds and their respective costs and needs to ensure that the company has a sound capital structure, i.e. a proper balance between equity capital and debt.
- Such managers also need to have a very clear understanding as to the difference between profit and cash flow, bearing in mind that profit is of little avail unless the organization is adequately supported by cash to pay for assets and sustain the working capital cycle. Financing decisions also call for a good knowledge of evaluation of risk, e.g. excessive debt carried high risk for an organization's equity because of the priority rights of the lenders.

(c) Dividend decisions:

- These decisions relate to the determination as to how much and how frequently cash can be paid out of the profits of an organization as income for its owners / shareholders.
- The owner of any profit making organization looks for reward for his investment in two ways, the growth of the capital invested and the cash paid out as income; for a sole trader this income would be termed as drawings and for a limited liability company the term is dividends.
- The dividend decision thus has two elements - the amount to be paid out and the amount to be retained to support the growth of the organization, the latter.
- Being also a financing decision; the level and regular growth of dividends represent a significant factor in determining a profit-making company's market value, i.e. the value placed on its shares by the stock market.



All three types of decisions are interrelated, the first two pertaining to any kind of organization while the third relates only to profit - making organizations, thus it can be seen that financial management is of vital importance at every level of business activity, from a sole trader to the largest multinational corporation.

(d) Working capital management(WCM):

Generally, short term decision are reduced to management of current liability (i.e., working capital management).

**8. Importance of financial management:(TEST CBI)**

---

- **T**ax planning that will minimize the taxes a business has to pay
- **E**nsuring that there is a sufficient level of short - term working capital
- **S**etting sales revenue targets that will deliver growth
- **T**aking care not to over - invest in fixed assets
- **C**ontrolling the level of general and administrative expenses by finding more cost - efficient ways of running the day - to - day business operations , and
- **B**alancing cash - outflow with cash – inflows
- **I**ncreasing gross profit by setting the correct pricing for products or services

**9. Scope of Financial management**

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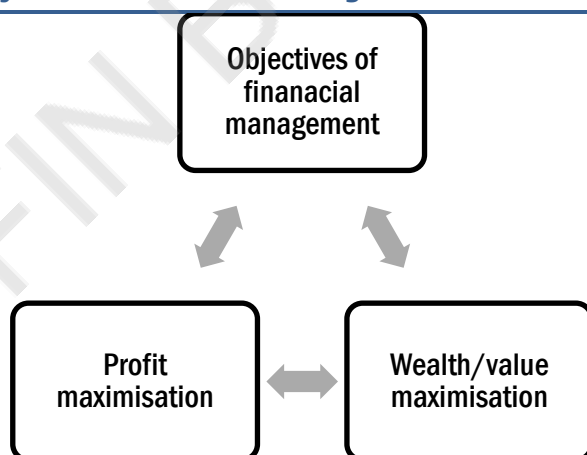
In order to study of financial management, the following aspects need to be taken care

- (a) Determining the size of the enterprise and determination of rate of growth.
- (b) Determining the composition of assets of the enterprise.
- (c) Determining the mix of enterprise’s financing i.e consideration of level of debt to equity, etc.,
- (d) Analysis, planning and control of financial affairs of the enterprise.

In the initial days, the scope of financial management is limited to procurement of funds, major activities of an enterprise like promotion, expansion, merger etc., Now a days, the financial management, includes besides procurement of funds, the three kinds of decisions namely Investment, financing and dividend decisions

**10. Objectives of financial management:**

---



1) Profit maximization:

Once upon a time, the primary objective of the company is to earn profits, so the objective of financial management profit maximization, so the financial manager has to make decisions to earn more profits.

If profit is given undue importance, so many problems can arise. Those problems are explained as follows:

- The term profit is vague. It does not clarify what exactly it means.
- Profit maximization has to be attempted with a realization of risks involved.
- Profit maximization as an objective does not take into account the time. Pattern of returns.
- Profit maximization as an objective is too narrow.

- ❖ **The term profit is vague. It does not clarify what exactly it means.**  
It describes a different meaning to different people.  
For example, profit may be in short term or long term period; it may be total profit or rate of profit etc
- ❖ **Profit maximization has to be attempted with a realization of risks involved.**  
There is a direct relationship between risk and profit. Higher the risk higher is the possibility of profits. If profit maximization is the only goal, then risk factor is altogether ignored. This implies that finance manager will accept highly risky proposals also, if they give high profits. In practice, however, risk is very important consideration and has to be balanced with the profit objective.
- ❖ **Profit maximization as an objective does not take into account the time. Pattern of returns.**  
Proposal A may give a higher amount of profits as compared to proposal B , yet if the returns of proposal A begin to flow say 10 years later , proposal B may be preferred which may have lower overall profit but the returns flow is more early and quick .
- ❖ **Profit maximization as an objective is too narrow.**  
It fails to take into account the social considerations as also the obligations to various interests of workers, consumers, society, as well as ethical trade practices. If these factors are ignored, a company cannot survive for long. Profit maximization at the cost of social and moral obligations is a short sighted policy.

2) **Wealth / value maximization:**

$$\text{wealth} = \text{present value of benefits} - \text{present value of costs}$$

In order to measure and maximize shareholders wealth finance manager should follow the below:

Measurement and maximization shareholders wealth		
Cost benefit analysis	Cash flow approach not accounting profit	Application of time value of money

## 11. Wealth Maximization Process

---



$$V = N \times MP$$

or

$$V = V_e + V_d$$

v = value of a firm  
N = No. of shares  
MP = market price  
V<sub>e</sub> = value of equity  
V<sub>d</sub> = value of debt

## 12. Important Goals of Business Enterprise: (GLEM CC)

---

- ✓ Gaining higher **G**rowth rate
- ✓ Gaining **L**eadership in the market
- ✓ Promoting **E**mployee welfare
- ✓ Achieving a larger **M**arket rate
- ✓ Improving **C**ustomer satisfaction
- ✓ Increasing **C**ommunity life, supporting education and research, solving societal problems.

Even though the above goals are very important, the primary goal of business enterprise is to achieve wealth maximization.

### 13. Profit v/s value maximization conflict:

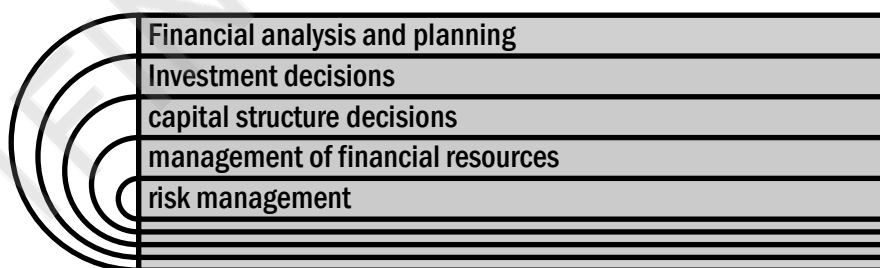
- The wealth maximization objective is generally in accord with the interests of the various groups such as owners, employees, creditors and society, and thus, it may be consistent with the management objective of survival.
- In profit maximization, in today's real world situations which is uncertain and multi - period in nature, wealth maximization is a better objective. Where the time period is short and degree of uncertainty is not great, wealth maximization and profit maximization amount to essentially the same.

The following table explains the different contents of profit maximization and wealth maximization.

Contents	Profit maximization	Wealth maximization
Objective	Large amount of profits	Highest market value of shares
Advantages	<ul style="list-style-type: none"> <li>▪ Easy to calculate profits</li> <li>▪ Easy to determine link between financial decisions and profits.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Recognizes risk and uncertainties</li> <li>▪ Emphasizes long term gains</li> <li>▪ Recognizes the timing of returns</li> <li>▪ Considers share holders return</li> </ul>
Disadvantages	<ul style="list-style-type: none"> <li>▪ Ignores the risk or uncertainty</li> <li>▪ Emphasizes the short term gains</li> <li>▪ Ignores the timing of returns</li> <li>▪ Requires the immediate resources</li> </ul>	<ul style="list-style-type: none"> <li>▪ There is no clear relationship between financial decisions and share price</li> <li>▪ Can lead to management anxiety and frustration.</li> </ul>

### 14. Role of finance executive:

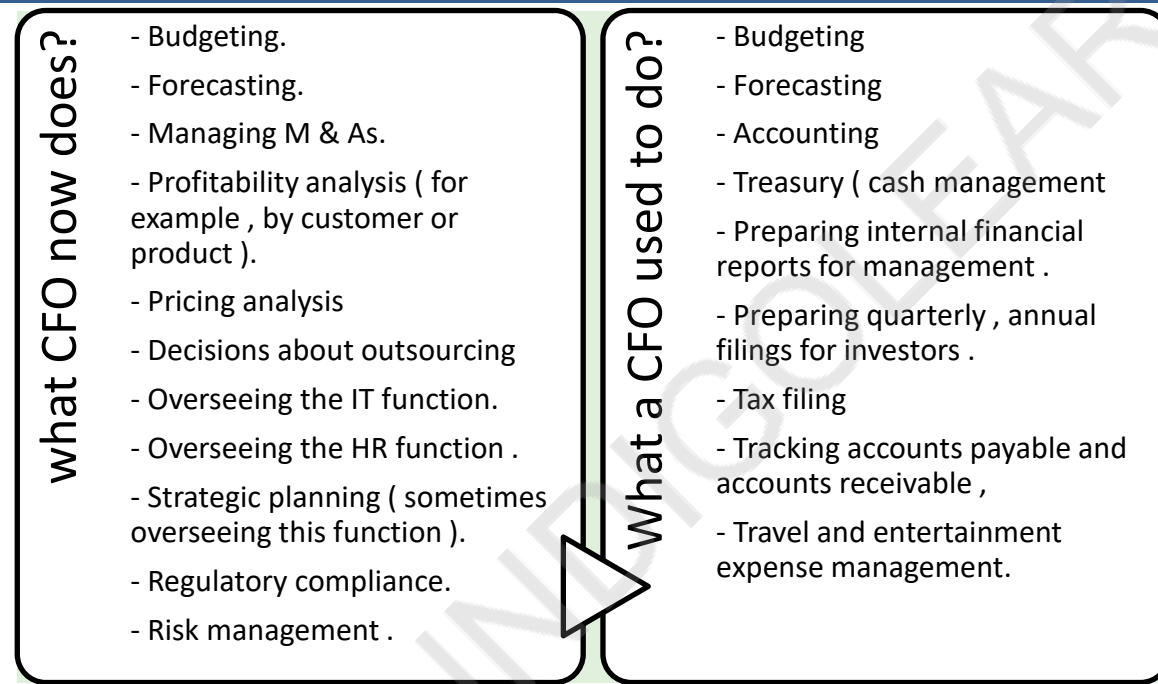
The following are the responsibilities of finance executive,



- Financial analysis and planning :  
Determining the proper amount of funds to employ in the firm, i.e. designating the size of the firm and its rate of growth
- Investment decisions :  
The efficient allocation of funds to specific assets

- Financing and capital structure decisions:  
Raising funds on favorable terms as possible i.e. determining the composition of liabilities
- Management of financial resources:  
He needs to manage various financial resources. Such as working capital
- Risk management:  
This protects the assets.

### 15. Role of finance executive in today's world vis-à-vis in the past:



### 16. Financial Distress and insolvency:

- Higher debt requires higher interest and if the cash inflow is not sufficient then it will put lot of pressure to the organization. Both short term and long term creditors will put stress to the firm. If all the above factors are not well managed by the firm, it can create situation known as distress.
- So financial distress is a position where Cash inflows of a firm are inadequate to meet all its current obligations.
- Now if distress continues for a long period of time, firm may have to sell its asset, even many times at a lower price. Further when revenue is inadequate to revive the situation, firm will not be able to meet its obligations and become insolvent.
- So , insolvency basically means inability of a firm to repay various debts and is a result of continuous financial distress

### 17. Relationship of financial management with related disciplines:

Financial management is also related other disciplines, which are given below

#### 17.1 Financial management and accounting:

- The relationship between financial management and accounting are closely related to the extent that accounting is an important input in financial decision making

- Financial accounting generates information relating to operations of the organization. The outcome of accounting is the financial statements such as balance sheet , income statement , and the statement of changes in financial position
- Though financial management and accounting are closely related, still they differ in the treatment of funds and also with regards to decision making. Some of the differences are TREATMENT OF FUNDS and DECISION MAKING.

#### **TREATMENT OF FUNDS:**

- ***In accounting***, the measurement of funds is based on the accrual principle i.e. revenue is recognized at the point of sale and not when collected and expenses are recognized when they are incurred rather than when actually paid. The accrual based accounting data do not reflect fully the financial conditions of the organization. An organization which has earned profit (sales less expenses) may said to be profitable in the accounting sense but it may not be able to meet its current obligations due to shortage of liquidity as a result of say, uncollectible receivables. Such an organization will not survive regardless of its levels of profits
- The treatment of funds ***in financial management*** is based on cash flows. The revenues are recognized only when cash is actually received (i.e. cash inflow) and expenses are recognized on actual payment (i e. cash outflow). This is so because the finance manager is concerned with maintaining solvency of the organization by providing the cash flows necessary to satisfy its obligations and acquiring and financing the assets needed to achieve the goals of the organization. Thus , cash flow based returns help financial managers to avoid insolvency and achieve desired financial goals

#### **DECISION MAKING:**

- The purpose of accounting is to collect and present financial data of the past, present and future operations of the organization. The financial manager uses these data for financial decision making.
- It is not that the financial managers cannot collect data or accountants cannot make decisions, but the chief focus of an accountant is to collect data and present the data while the financial manager's primary responsibility relates to financial planning, controlling and decision making.
- Thus , in a way it can be stated that financial management begins where accounting ends

### **17.2 Financial management with other disciplines:**

- Financial management also draws on other related disciplines such as marketing, production and quantitative methods apart from accounting.
- For instance, financial managers should consider the impact of new product development and promotion plans made in marketing area since their plans will require capital outlays and have an impact on the projected cash flows.
- Likewise, changes in the production process may require capital expenditures which the financial managers must evaluate and finance.
- Finally , the tools and techniques of analysis developed in the quantitative methods discipline are helpful in analyzing complex financial management problems
- The marketing, production and quantitative methods are, thus, only indirectly related to day to day decision making by financial managers and are supportive in nature while accounting is the primary discipline on which the financial manager draws considerably.
- Even economics can also be considered as one of the major disciplines which help the financial manager to gain knowledge of what goes on in the world outside the business.

## **18. Agency problem and agency cost:**

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- ❖ Even Though in a sole proprietorship firm, partnership etc, owners participate in management but in corporate, owners are not active in management so, there is a separation between owner / shareholders and managers.
- ❖ Then managers should act in the best interest of shareholders however in reality, managers may try to maximize their individual goal like salary, perks etc, so there is a principal agent relationship between managers and owners, which is known as Agency Problem.
- ❖ Agency Problem is the chances that managers may place personal goals ahead of the goal of owners, Agency Problem leads to Agency Cost. Agency cost is the additional cost borne by the shareholders to monitor the manager and control their behavior so as to maximize shareholders wealth.
- ❖ Agency Costs are of four types
  - (1) Monitoring
  - (2) Bonding
  - (3) Opportunity
  - (4) Structuring.

### **Addressing the agency problem:**

Agency problem between the managers and shareholders can be addressed if the interests of the managers are aligned to the interests of the shareholders. However, following efforts have been made to address these issues:

- ❖ Managerial compensation is linked to profit of the company to some extent and also with the long term objectives of the company
- ❖ Employee is also designed to address the issue with the underlying assumption that maximization of the stock price is the objective of the investors
- ❖ Effecting monitoring can be done.

## CHAPTER 2 TYPES OF FINANCING

### 1. Financial needs and sources of finance of a business

Every business has following three groups of financial needs, those are namely

Long term financial needs

Medium term financial needs

Short term financial needs

#### a. Long term financial needs:

- These needs are for a period exceeding 5-10 years. These needs include Plant, machinery, land and buildings etc.,
- These needs also used to finance hard core working capital requirement.

#### b. Medium term financial needs:

- These needs are for a period between 1-5 years. Ex. Deferred revenue expenses.
- Funds required to meet the medium term financial needs are classified under medium term financial needs.

#### c. Short term financial needs:

- These needs are for a period not exceeding 1 year. These needs arise to finance current assets like stock, debtors, cash and working capital requirement etc.,

#### 1.1 Basic principle for funding various Needs:

Based on Borrowing type and nature of borrowing, financing of different assets should be classified.

Purpose	Type of borrowing	Borrower nature
Non-current Asset	Equity	Start up
	Long term loan	Small and medium enterprise Large and mid corporate
Current asset	Long term loan	Medium term loan for SMEs
	Short term loan	
Non-current asset	Short term loan	Large corporate

Based on nature of business and sources of funds, the stages of development of the business can be classified as follows:



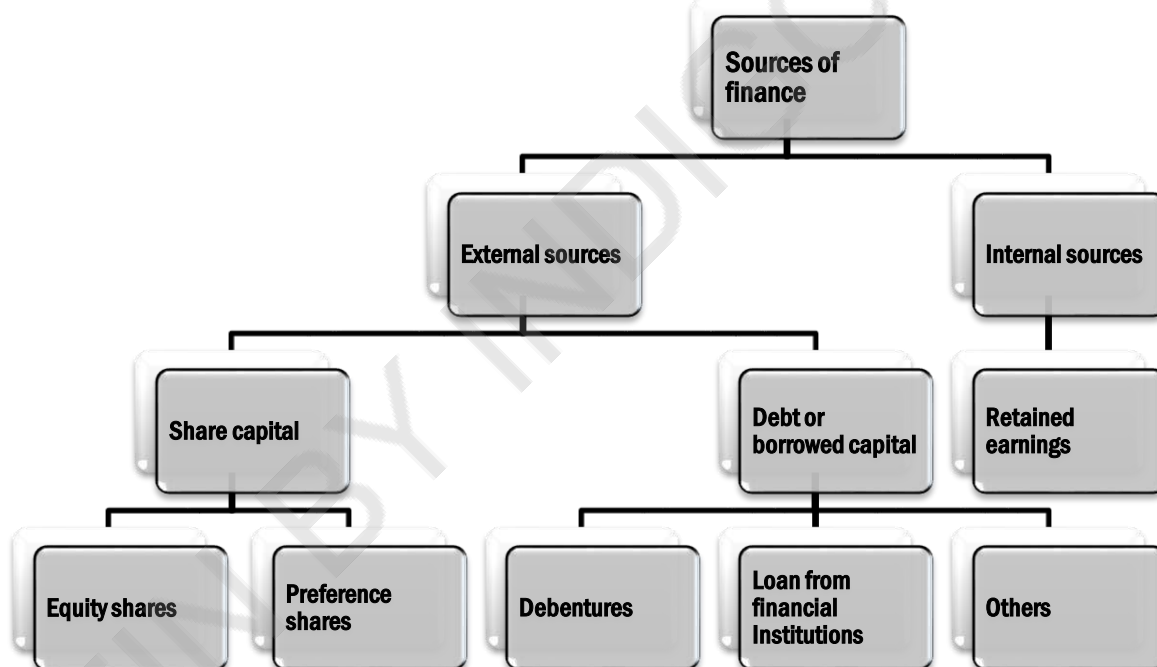
Stage	Nature of business	Sources of funds
Early stage	High Uncertainty	Equity: Angel fund
	High to moderate Uncertainty	Equity: Venture capital; Debt
Growth stage	Moderate to low Uncertainty	Debt; Venture capital; private equity
Stable stage	Low Uncertainty	Debt

## 2. Classification of financial sources:

The following are the two main sources of finance

- Based on basic sources
- Based on Maturity of repayment period

### 2.1 Sources of finance based on basic sources



## 2.2 Sources of finance based on Maturity of payment

Long term	Medium term	Short term
<ul style="list-style-type: none"><li>• Share capital or equity shares</li><li>• Preference shares</li><li>• Retained earnings</li><li>• Debentures/bonds of different types</li><li>• Loans from financial institutions</li><li>• Loan from state financial corporations</li><li>• Loans from commercial banks</li><li>• venture capital financing</li><li>• Asset securitization</li><li>• International financing like: Euro issues, Foreign currency loans</li></ul>	<ul style="list-style-type: none"><li>• Preference shares</li><li>• Debentures/bonds</li><li>• Public deposits/Fixed deposits for duration of 3 years</li><li>• Medium term loans from commercial banks, financial institutions, state financial corporations</li><li>• Lease financing / Hire purchase financing</li><li>• external commercial borrowings</li><li>• Euro-issues</li><li>• Foreign currency bonds</li></ul>	<ul style="list-style-type: none"><li>• Trade credit</li><li>• Accrued Expenses and deferred income</li><li>• short term loans like working capital loans from commercial banks</li><li>• Fixed deposits for a period of 1 year or less</li><li>• Advances received from customers</li><li>• various short term provisions</li></ul>

## 3. External sources of finance

The following are the various sources of funds available to meet long term financial needs of business. Those are

- Owners capital or equity capital
- Preference share capital
- Debentures
- Bonds
- Loans from commercial banks

### 3.1 Owners' capital or equity capital:

A public limited company may raise funds from promoters or from the investing public by way of owner's capital or equity capital by issuing ordinary equity shares. The following are the different features of equity share capital:

- Owners capital is the source of permanent capital.
- The holders of equity share capital are called as equity share holders or ordinary share holders. Those are the owners of the company.
- This capital contains high risk.
- Equity shareholders are entitled to dividends after the income claims of other stakeholders are satisfied.
- The dividend payable to them is an appropriation of profits and not a charge against profits.
- At the time of winding up, ordinary shareholders can exercise their claim on assets after the claims of the other suppliers of capital have been met.
- The cost of ordinary shares is usually the highest. This is due to the fact that such shareholders expect a higher rate of return on their investment as compared to other suppliers of long-term funds.

- Ordinary share capital also provides a security to other suppliers of funds.
- Any institution giving loan to a company would make sure the debt - equity ratio is comfortable to cover the debt . There can be various types of equity shares like New issue , Rights issue , Bonus Shares , Sweat Equity

### 3.1.1 Advantages and Disadvantages of raising funds by issue of equity shares are:

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• It is a permanent source of finance . Since such shares are not redeemable , the company has no liability for cash outflows associated with its redemption.</li> <li>• Equity capital increases the company's financial base and thus helps to further the borrowing powers of the company . This is because ; debt will enable the company to increase its earnings per share and consequently , its share prices .</li> <li>• A company is not obliged legally to pay dividends . Hence in times of uncertainties or when the company is not performing well , dividend payments can be reduced or even suspended .</li> <li>• A company can make further increase its share capital by initiating a right issue</li> </ul>	<ul style="list-style-type: none"> <li>• Dividend income is taxable in the hands of the recipient of dividend.</li> <li>• Investors find ordinary shares riskier because of uncertain dividend payments and capital gains.</li> <li>• The issue of new equity shares reduces the earning per share of the existing shareholders until and unless the profits are proportionately increased.</li> <li>• The issue of new equity shares can also reduce the ownership and control of the existing shareholders</li> </ul>

### 3.2 Preference share capital:

These are special kind of shares; the holders of such shares enjoy priority, both as regard to the payment of a fixed amount of dividend and also towards repayment of capital on winding up of the company. The following are the important types of preference shares.

Types of preference shares	Features
Cumulative	Arrear dividend will accumulate.

Non-cumulative	No right to arrear dividend.
Redeemable	Redemption should be done.
Participating	Can participate in the surplus which remains after payment to equity shareholders.
Non-participating	Cannot participate in the surplus after payment of fixed rate of dividend.
Convertible	Option of converting into equity shares.

### 3.2.1 Characteristics of preference share capital:

- The rate of dividend on preference shares is normally higher than the rate of interest on debentures , loans etc.
- Most of preference shares these days carry a stipulation of period and the funds have to be repaid at the end of a stipulated period.
- Preference share capital is a hybrid form of financing which imbibes within itself some characteristics of equity capital and some attributes of debt capital.
- It is similar to equity because preference dividend , like equity dividend is not a tax deductible payment . It resembles debt capital because the rate of preference dividend is fixed.
- Long - term funds from preference shares can be raised through a public issue of shares.
- Such shares are normally cumulative , i.e., the dividend payable in a year of loss gets carried over to the next year till there are adequate profits to pay the cumulative dividends
- Cumulative Convertible Preference Shares ( CCPs ) may also be offered , under which the shares would carry a cumulative dividend of specified limit for a period of say three years after which the shares are converted into equity shares . These shares are attractive for projects with a long gestation period.
- Preference share capital may be redeemed at a pre decided future date or at an earlier stage inter alia out of the profits of the company . This enables the promoters to withdraw their capital from the company which is now self sufficient , and the withdrawn capital may be reinvested in other profitable ventures.

### 3.2.2 Difference between equity share capital and preference shares:

Basis	Equity shares	Preference shares
Voting rights	Equity shareholders enjoy full voting rights	They have very limited voting rights
Dividend payment	Equity dividend is paid after preference dividend.	Payment of preference dividend is preferred over equity dividend.
Rate of dividend	Fluctuating	Fixed
Covertibility	Non convertible	Convertible

### 3.2.3 Advantages and Disadvantages of raising funds by issue of preference shares

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• <b>Advantage of leverage</b> as it bears a fixed charge. Non - payment of preference dividends does not force a company into liquidation.</li><li>• There is no risk of takeover as the preference shareholders do not have voting rights except where dividend payment are in arrears.</li><li>• The preference dividends are fixed and pre - decided . Hence preference shareholders cannot participate in surplus profits as the ordinary shareholders can except in case of participating preference shareholders.</li><li>• Preference capital can be redeemed after a specified period .</li><li>• No dilution in EPS on enlarged capital base - On the other hand if equity shares are issued it reduces EPS , thus affecting the market perception about the company</li></ul>	<ul style="list-style-type: none"><li>• Preference dividends are cumulative in nature . This means that if in a particular year preference dividends are not paid they shall be accumulated and paid later .</li><li>• Preference dividend is not tax deductible and so does not provide a tax shield to the company . Hence preference shares are costlier to the company than debt e.g. debenture</li></ul>

### 3.3 Debentures:

Loans can be raised from public by issuing debentures or bonds by public limited companies . Some of the **characteristics of debentures** are :

- Debentures are either secured or unsecured .
- They may or may not be listed on the stock exchange .
- The cost of capital raised through debentures is quite low since the interest payable on debentures can be charged as an expense before tax.
- From the investors ' point of view , debentures offer a more attractive prospect than the preference shares since interest on debentures is payable whether or not the company makes profits .
- Debentures are normally issued in different denominations ranging from ₹ 100 to 1,000 and carry different rates of interest .
- Normally , debentures are issued on the basis of a debenture trust deed which lists the terms and conditions on which the debentures are floated.
- Debentures are basically instruments for raising long - term debt capital .
- The period of maturity normally varies from 3 to 10 years and may also increase for projects having high gestation period.

### 3.3.1 Classification of debentures based on their convertibility:

<b><u>Non - convertible debentures:</u></b> These types of debentures do not have any feature of conversion and are repayable on maturity .
<b><u>Fully convertible debentures:</u></b> Such debentures are converted into equity shares as per the terms of issue in relation to price and the time of conversion Interest rates on such debentures are generally less than the non - convertible debentures because they carry an attractive feature of getting themselves converted into shares at a later time .
<b><u>Partly convertible debentures:</u></b> These debentures carry features of both convertible and non - convertible debentures . The investor has the advantage of having both the features in one debenture .

### 3.3.2 Other types of Debentures with their features:

Type of Debentures	Feature
Redeemable	Repaid after a certain period
Non-redeemable	Not repayable
Bearer	Transferable like negotiable instruments
Registered	Interest payable to registered person
Mortgage	Secured by a charge on assets
Naked or Simple	Unsecured

### 3.3.3 Advantages and Disadvantages of raising funds by issue of Debentures are:

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• The cost of debentures is much lower than the cost of preference or equity capital as the interest is tax - deductible . Also , investors consider debenture investment safer than equity or preferred investment and , hence , may require a lower return on debenture investment .</li> <li>• Debenture financing does not result in dilution of control .</li> <li>• In a period of rising prices , debenture issue is advantageous . The fixed monetary outgo decreases in real terms as the price level increases . In other words , the company has to pay a fixed rate of interest .</li> </ul>	<ul style="list-style-type: none"> <li>• Debenture interest and the repayment of its principal amount is an obligatory payment .</li> <li>• The protective covenants associated with a debenture issue may be restrictive .</li> <li>• Debenture financing enhances the financial risk associated with the firm.</li> <li>• Since debentures need to be paid at the time of maturity, a large amount of cash outflow is needed at that time.</li> </ul>

### 3.3.4 Differences between Debentures and preference shares:

Basis	Debentures	Preference shares
<b>Nature</b>	Debentures are instruments for raising long term capital with a fixed period of maturity	Preference shares are a hybrid form of financing with some characteristic of equity shares and some attributes of debt capital.
<b>Ownership</b>	Debenture is a type of loan which can be raised from the public.	Preference share capital is a special kind of share.
<b>Payment of Interest/Dividend</b>	It carries fixed percentage of interest.	The preference share holders enjoy priority both as regard to the payment of a fixed amount of dividend and also to vote

		repayment of capital in case of winding up of a company.
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### 3.4 Bond:

Bond is fixed income security created to raise fund. Bonds can be raised through public issue and through private placement.

#### 3.4.1 Types of Bonds

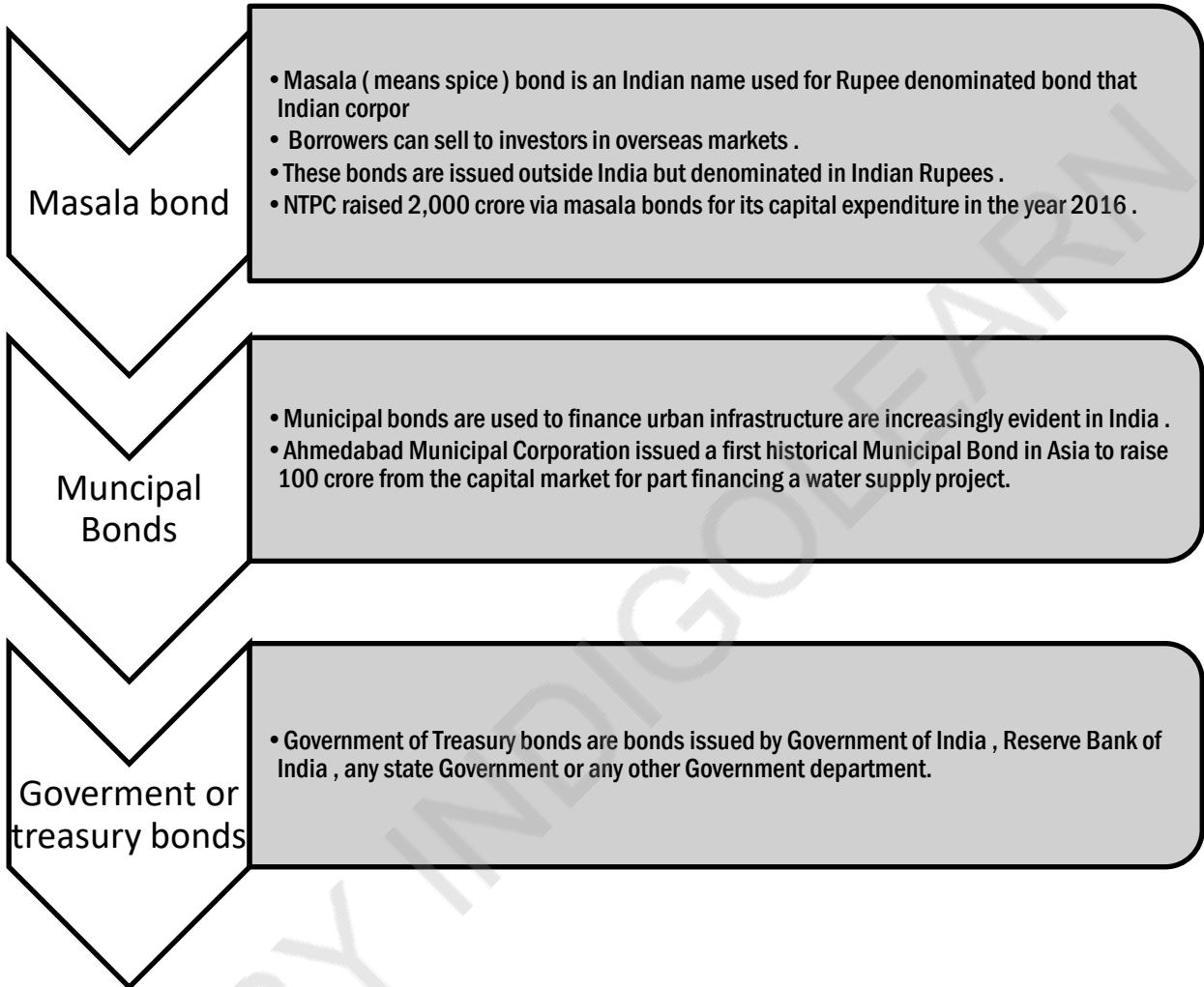
Based on call, Bond can be classified as

Callable bonds	Puttable bonds
A callable bond has a call option which gives the issuer the right to redeem the bond before maturity at a predetermined price known as the call price (Generally at premium)	Puttable bonds give the investor a put option (i.e the right to sell the bond) back to the company before maturity.



### 3.4.2 Various types of bonds with their features:

#### A) Indian Bonds



**B) Foreign bonds:**

**Foreign currency convertible bond(FCCB)**

- This bond comes at a very low rate of interest .
- The advantage to the issuer is that the issuer can get foreign currency at a very low cost .
- The risk is that in case the bond has to be redeemed on the date of maturity , the issuer has to make the payment and at that time the issuer may not have the money.

**Plain vanilla bond**

- The issuer would pay the principal amount along with the interest rate .
- This type of bond would not have any options .
- This bond can be issued in the form of discounted bond or can be issued in the form of coupon bearing bond .

**Convertible floating rate notes(FRN)**

- A convertible FRN is issued by giving its holder an option to convert it into a longer term debt security with a specified coupon
- It protects an investor against falling interest rate
- The long - term debt security can be sold in the market and the investor can earn profit
- Capital gain is not applicable to FRN

**Drop lock bond**

- It is a Floating Rate Note with a normal floating rate
- The floating rate bond automatically converted into fixed rate bond if interest rate falls below a predetermined level
- The new fixed rate stays till the drop lock bond reaches its maturity
- The difference between the convertible floating rate note and drop lock bond is that the former is a long option structure and the later one is a short option structure

**Variable rate demand obligations**

- A normal floating rate note with a nominal maturity
- The holder of the floating rate note can sell the obligation back to the trustee at par plus accrued interest
- It gives the investor an option to exit , so it is more liquid than the normal FRN

<p>Yield curve Note(YCN)</p>	<ul style="list-style-type: none"> <li>• It is a structured debt security</li> <li>• Yield increases when prevailing interest rate declines</li> <li>• Yield decreases when prevailing interest rate increases</li> <li>• This is used to hedge the interest rate</li> <li>• This works like inverse floater</li> </ul>
<p>Yankee Bond</p>	<ul style="list-style-type: none"> <li>• These bonds are denominated in dollars</li> <li>• Bonds issued by non- US banks and non- US corporations</li> <li>• Bonds are issued in USA</li> <li>• Bonds are to be registered in SEC ( Securities and Exchange Commission )</li> <li>• Bonds are issued in tranches</li> <li>• Time taken can be up to 14 weeks</li> <li>• Interest rate is dollar LIBOR ( London Interbank Offered Rate )</li> </ul>
<p>Euro bond</p>	<ul style="list-style-type: none"> <li>• These are issued or traded in a country using a currency other than the one in which the bond is denominated .</li> <li>• Eurobonds are issued by MNCs, for example , a British company may issue a Eurobond in Germany , denominating it in U.S. dollars</li> <li>• The prefix " euro- " is used more generally to refer to deposit outside the jurisdiction of the domestic central bank</li> </ul>
<p>Samurai bond</p>	<ul style="list-style-type: none"> <li>• Samurai bonds are denominated in Japanese Yen JPY</li> <li>• Issued in Tokyo</li> <li>• Issuer Non- Japanese Company</li> <li>• Purpose : Access of capital available in Japanese market. It can also be used to hedge foreign exchange risk</li> </ul>
<p>Bulldog bond</p>	<ul style="list-style-type: none"> <li>• It is denominated in Bulldog Pound Sterling / Great Britain Pound ( GBP )</li> <li>• Issued in London .</li> <li>• Issuer Non - UK Company</li> <li>• Regulations : Great Britain</li> <li>• Purpose : Access of capital available in UK market</li> <li>• Issue proceeds can be used to fund UK operation</li> <li>• Issue proceeds can be used to fund a company's local opportunities</li> </ul>

### 3.5 Loans from financial institutions:

National financial institutions		
Name of financial institutions	Year of establishment	Remarks
Industrial finance corporation of India(IFCI)	1918	Converted into a public company
State financial corporations(SFCs)	1951	-
Industrial Development bank of India(IDBI)	1954	Converted into bank
National Industrial development corporation(NIDC)	1954	-
Industrial credit and Investment corporation of india(ICICI)	1955	Converted into bank and privatised
Life insurance corporation of india(LIC)	1956	-
Unit trust of India(UTI)	1964	-
Industrial reconstruction bank of india(IRBI)	1971	-
International financial institutions		
The world bank/ International bank for reconstruction and development(IBRD)	1944	-
The International Finance corporation(IFC)	1956	-
Asian development bank(ADB)	1966	-

### 3.6 Loans from commercial banks:

The primary role of the commercial banks is to cater to the short - term requirements of industry . Of late , however , banks have started taking an interest in long term financing of industries in several ways .

- The banks provide long term loans for the purpose of expansion or setting up of new units. Their repayment is usually scheduled over a long period of time. The liquidity of such loans is said to depend on the anticipated income of the borrowers.
- As part of the long - term funding for a company , the banks also fund the long term working capital requirement ( it is also called WCTL i.e. working capital term loan ). It is funding of that portion of working capital which is always required ( the minimum level ) and is not impacted by seasonal requirement of the company

### 3.7 BRIDGE FINANCE

Bridge finance refers to loans taken by a company normally from commercial banks for a short period because of pending disbursement of loans sanctioned by financial institutions.

- Though it is of short - term nature but since it is an important step in the facilitation of long - term loan , therefore it is being discussed along with the long term sources of funds .
- Normally , it takes time for financial institutions to disburse loans to companies . However , once the loans are approved by the term lending institutions , companies , in order not to lose further time in starting their projects , arrange short term loans from commercial banks .
- The bridge loans are repaid / adjusted out of the term loans as and when disbursed by the concerned institutions .
- Bridge loans are normally secured by hypothecating movable assets , personal guarantees and demand promissory notes . Generally , the rate of interest on bridge finance is higher as compared with that on term loans .
- Having discussed funding from share capital ( equity / preference ) , raising of debt from financial institutions and banks , we will now discuss some other important sources of long - term finance .

### **3.8 Venture capital financing:**

The venture capital financing refers to financing of new high risky venture promoted by qualified entrepreneurs who lack experience and funds to give shape to their ideas.

In broad sense , under venture capital financing , venture capitalist make investment to purchase equity or debt securities from inexperienced entrepreneurs who undertake highly risky ventures with potential to succeed in future.

#### **3.8.1 Features of Venture capital financing:**

- It is basically an equity finance in new companies .
- It can be viewed as a long - term investment in growth - oriented small / medium firms .
- Apart from providing funds , the investor also provides support in form of sales strategy , business networking and management expertise , enabling the growth of the entrepreneur .

### 3.8.2 Methods of Venture capital financing:

Equity financing	Conditional loan	Income note	Participating debenture
<ul style="list-style-type: none"> <li>• VCs require funds for a longer period</li> <li>• VCs generally provide funds by way of equity share capital.</li> <li>• The equity contribution of venture capital firm does not exceed 49 % of the total equity capital of venture capital undertakings so that the effective control and ownership remains with the entrepreneur.</li> </ul>	<ul style="list-style-type: none"> <li>• A conditional loan is repayable in the form of a royalty after the venture is able to generate sales .</li> <li>• No interest is paid on such loans</li> <li>• Rate depends on other factors of the venture such as gestation period , cash flow patterns , risk and other factors of the enterprise.</li> <li>• Some VCs give a choice to the enterprise of paying a high rate of interest instead of royalty on sales once it becomes commercially sound</li> </ul>	<ul style="list-style-type: none"> <li>• It is a hybrid security which combines the features of both conventional loan and conditional loan.</li> <li>• The entrepreneur has to pay both interest and royalty on sales but at substantially low rates.</li> <li>• IDBI's VCF provides funding equal to 80-87.50 % of the projects cost for commercial application of indigenous technology.</li> </ul>	<ul style="list-style-type: none"> <li>• Such security carries charges in three phases - in the start - up phase no interest is charged , next stage a low rate of interest is charged up to a particular level of operation , after that , a high rate of interest is required to be paid.</li> </ul>

### 3.9 Debt Securitisation:

- Securitisation is a process in which illiquid assets are pooled into marketable securities that can be sold to investors.
- The process leads to the creation of financial instruments that represent ownership interest in , or are secured by a segregated income producing asset or pool of assets .
- These assets are generally secured by personal or real property such as automobiles , real estate , or equipment loans but in some cases are unsecured.

#### Example:

A finance company has given a large number of car loans . It needs more money so that it is in a position to give more loans . One way to achieve this is to sell all the existing loans . But , in the absence of a liquid secondary market for individual car loans , this is not feasible .

However , a practical option is debt securitisation , in which the finance company sells its existing car loans already given to borrowers to the Special Purpose Vehicle ( SPV ) . The SPV , in return pays to the company , which in turn continue to lend with this money . On the other hand , the SPV pools these loans and convert these into marketable securities . It means that now these converted securities can be issued to investors .

So , this process of debt securitization helps the finance company to raise funds and get the loans off its Balance Sheet . These funds also help the company disburse further loans . Similarly , the process is beneficial to the investors also as it creates a liquid investment in a diversified pool of car loans , which may be an attractive option to other fixed income instruments . The whole process is carried out in such a way that the original debtors i.e. the car loan borrowers may not be aware of the transaction . They might have continued making payments the way they are already doing . However , these payments shall now be made to the new investors who have emerged out of this securitization process .

### 3.10 Lease Financing:

#### Meaning:

Leasing is a general contract between the owner and user of the asset over a specified period of time. The asset is purchased initially by the lessor ( leasing company ) and thereafter leased to the user ( lessee company ) which pays a specified rent at periodical intervals.

Thus , leasing is an alternative to the purchase of an asset out of own or borrowed funds. Moreover , lease finance can be arranged much faster as compared to term loans from financial institutions.

### 3.11 Types of lease contracts:

The lease contracts can be divided into two types they are

- Operating lease
  - Finance lease
1. **Operating lease:**
    - An operating lease is a form of lease in which the right to use the asset is given by the lessor to the lessee. However , the ownership right of the asset remains with the lessor.
    - The lessee gives a fixed amount of periodic lease rentals to the lessor for using the asset. Further , the lessor also bears the insurance , maintenance and repair costs etc. of the asset.
    - In operating lease , the lease period is short. So , the lessor may not be able to recover the cost of the asset during the initial lease period and tend to lease the asset to more than one lessee.
    - Normally , these are callable lease and are cancelable with proper notice. The term of this type of lease is shorter than the asset's economic life.
    - The lessee is obliged to make payment until the lease expiration , which approaches useful life of the asset.
    - An operating lease is particularly attractive to companies that continually update or replace equipment and want to use equipment without ownership , but also want to return equipment at lease end and avoid technological obsolescence.
  2. **Finance lease:**
    - In contrast to an operating lease, a financial lease is long term in nature and non - cancelable i.e. the lessee cannot terminate the lease agreement subsequently So , the period of lease is generally the full economic life of the leased asset.
    - In other words , a financial lease can be regarded as any leasing arrangement that is to finance the use of equipment for the major parts of its useful life.
    - The lessee has the right to use the equipment while the lessor retains legal title. Further , in such lease , the lessee has to bear the insurance , maintenance and other related costs. It is also called capital lease , which is nothing but a loan in disguise.

- Thus , it can be said that a financial lease is a contract involving payments over an obligatory period of specified sums sufficient in total to amortise the capital outlay of the lessor and give some profit .

### 3.11.1 Difference between Finance lease and operating lease:

Basis	Finance Lease	Operating lease
<b>Risk and reward</b>	The risk and reward incident to ownership are passed on to the lessee . The lessor only remains the legal owner of the asset	The lessee is only provided the use of the asset for a certain time. Risk incident to ownership belong wholly to the lessor
<b>Obsolescence</b>	The lessee bears the risk of obsolescence	Cancellable
<b>Cancellable</b>	The lessor is interested in his rentals and not in the asset . He must get his principal back along with interest. Therefore , the lease is non - cancellable by either party	As the lessor does not have difficulty in leasing the same asset to other willing lessee , the lease is kept cancelable by the lessor
<b>Maintenance</b>	The lessor enters into the transaction only as financier. He does not bear the cost of repairs maintenance or operations	Usually , the lessor bears cost of repairs , maintenance or operations
<b>Fully pay out or not</b>	The lease is usually full payout that is , the single lease repays the cost of the asset together with the interest	The lease is usually non - payout , since the lessor expects to lease the same asset over and over again to several users.

### 3.11.2 Other lease types:

Sale and lease back
Leveraged lease
Sales-aid lease
Close-ended and open-ended leases

#### a) Sale and lease back:

- Under this type of lease, the owner of an asset sells the asset to a party ( the buyer ) , who in turn leases back the same asset to the owner in consideration of a lease rentals.
- Under this arrangement , the asset is not physically exchanged but it all happen in records only
- The main advantage of this method is that the lessee can satisfy himself completely regarding the quality of an asset and after possession of the asset convert the sale into a lease agreement. Under this transaction , the seller assumes the role of lessee ( as the same asset which he has sold came back to him in the form of lease ) and the buyer assumes the role of a lessor. So, the seller gets the agreed selling price and the buyer gets the lease rentals.

#### b) Leveraged lease:

- Under this lease , a third party is involved besides lessor and the lessee .



- The lessor borrows a part of the purchase cost ( say 80 % ) of the asset from the third party i.e. , lender and asset so purchased is held as security against the loan.
- The lender is paid off from the lease rentals directly by the lessee and the surplus after meeting the claims of the lender goes to the lessor.
- The lessor is entitled to claim depreciation allowance

**c) Sales-aid lease:**

- Under this lease contract , the lessor enters into a tie up with a manufacturer for marketing the latter's product through his own leasing operations , it is called a sales - aid lease.
- In consideration of the aid in sales , the manufacturer may grant either credit or a commission to the lessor. Thus , the lessor earns from both sources i.e. from lessee as well as the manufacturer.

**d) Close-ended and open-ended leases:**

- In the close - ended lease , the assets get transferred to the lessor at the end of lease , the risk of obsolescence , residual value etc. , remain with the lessor being the legal owner of the asset.
- In the open - ended lease , the lessee has the option of purchasing the asset at the end of the lease period.

**4. Internal sources of finance**

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**4.1 Retained Earnings:**

- Long - term funds may also be provided by accumulating the profits of the company and by ploughing them back into business.
- Such funds belong to the ordinary shareholders and increase the net worth of the company.
- A public limited company must plough back a reasonable amount of profit every year keeping in view the legal requirements in this regard and also for its own expansion plans .
- Such funds also entail almost no risk .
- Control of present owners is also not diluted by retaining profits.

**5. Short term sources of finance:**

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• Trade credit	• Certificates of deposit(CD)
• Accrued expenses & deferred(unearned) income	• Bank Advances
• Advances from customers	• Financing of export trade by banks
• Commercial paper	• Inter corporate deposits
• Treasury bills	• Certificate of deposit and public deposits.

The following are the various sources available to meet short term needs of finance. The different sources are discussed below.

**5.1 Trade credit:**

- It represents credit granted by suppliers of goods, etc., as an incident of sale.
- The usual duration of such credit is 15 to 90 days.
- It generates automatically in the course of business and is common to almost all business operations.
- It can be in the form of an ' open account ' or ' bills payable '.

- Trade credit is preferred as a source of finance because it is without any explicit cost and till a business is a going concern it keeps on rotating.
- Another very important characteristic of trade credit is that it enhances automatically with the increase in the volume of business.

#### **5.2 Accrued expenses & deferred(unearned) income:**

- Accrued Expenses and Deferred ( Unearned ) Income : Accrued expenses represent liabilities which a company has to pay for the services which it has already received like wages , taxes , interest and dividends.
- Such expenses arise out of the day - to - day activities of the company and hence represent a spontaneous source of finance.
- Deferred income , on the other hand , reflects the amount of funds received by a company in lieu of goods and services to be provided in the future. Since these receipts increase a company's liquidity , they are also considered to be an important source of spontaneous finance.

#### **5.3 Advances from customers:**

- Manufacturers and contractors engaged in producing or constructing costly goods involving considerable length of manufacturing or construction time usually demand advance money from their customers at the time of accepting their orders for executing their contracts or supplying the goods.
- This is a cost free source of finance and really useful.

#### **5.4 Commercial paper:**

- A Commercial Paper is an unsecured money market instrument issued in the form of a promissory note.
- The Reserve Bank of India introduced the commercial paper scheme in the year 1989 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 , in addition to the Corporate , Primary Dealers and All India Financial Institutions have also been allowed to issue Commercial Papers.
- Commercial papers are issued in denominations of 5 lakhs or multiples thereof and the interest rate is generally linked to the yield on the one - year government bond.

#### **5.5 Treasury Bills:**

- Treasury bills are a class of Central Government Securities Treasury bills , commonly referred to as T - Bills are issued by Government of India to meet short term borrowing requirements with maturities ranging between 14 to 364 days

#### **5.6 Certificates of deposit:**

- A certificate of deposit ( CD ) is basically a savings certificate with a fixed maturity date of not less than 15 days up to a maximum of one year.

#### **5.7 Bank advances:**

- Banks receive deposits from public for different periods at varying rates of interest.
- These funds are invested and lent in such a manner that when required , they may be called back.
- Lending results in gross revenues out of which costs , such as interest on deposits , administrative costs , etc. , are met and a reasonable profit is made.
- A bank's lending policy is not merely profit motivated but has to also keep in mind the socio economic development of the country.

## 5.8 Others

### Short term loans

- Entire advance is disbursed at one time either in cash or by transfer to the current account of the borrower.
- It is a single advance and given against securities.
- Repayment under the loan account is made either by way of repaying the full amount or by way of schedule of repayments agreed upon as in case of term loans.

### Overdraft

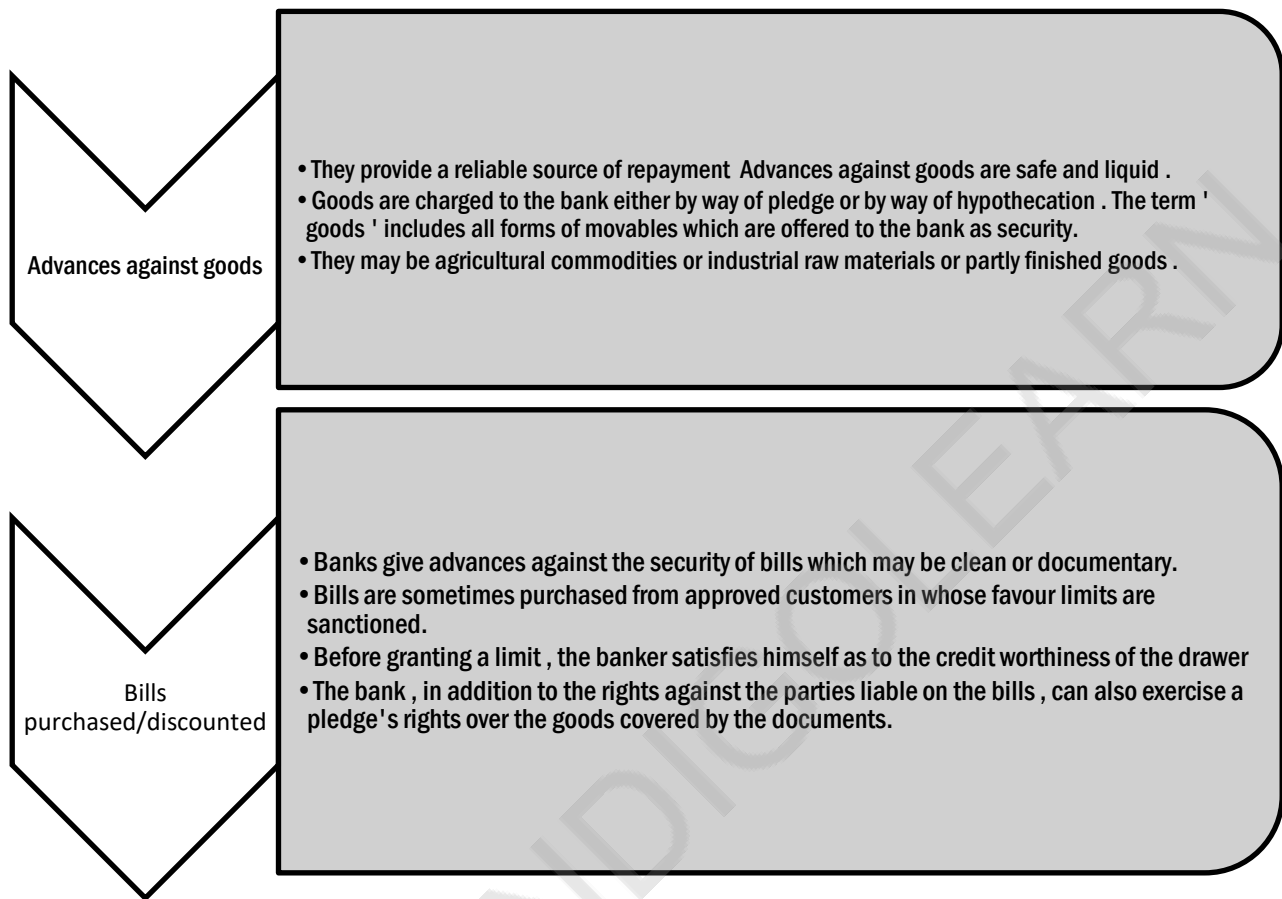
- Customers are allowed to withdraw in excess of credit balance standing in their Current Account.
- A fixed limit is , therefore , granted to the borrower within which the borrower is allowed to overdraw his account.
- Interest is charged on daily balances.

### Clean overdrafts

- The requests for clean advances are entertained only from parties which are financially sound and having reputation for their integrity.
- The bank has to rely upon the personal security of the borrowers.
- As a safeguard , banks take guarantees from other persons who are credit worthy before granting this facility . A clean advance is generally granted for a short period and must not be continued for long .

### Cash credits

- Under this arrangement , a customer need not borrow the entire amount of advance at one time ; he can only draw to the extent of his requirements and deposit his surplus funds in his account.
- Interest is charged on the amount actually availed by him.
- Generally , cash credit limits are sanctioned against the security of tradable goods by way of pledge or hypothecation.



**Financing of export trade by banks:**

Exports play an important role in accelerating the economic growth of developing countries like India. Out of the several factors influencing export growth, credit is a very important factor which enables exporters in efficiently executing their export orders. The commercial banks provide short - term export finance mainly by way of pre and post - shipment credit. Export finance is granted in Rupees as well as in foreign currency.

In view of the importance of export credit in maintaining the pace of export growth, RBI has initiated several measures in the recent years to ensure timely and hassle - free flow of credit to the export sector. These measures, inter alia, include rationalization and liberalization of export credit interest rates, flexibility in repayment / prepayment of pre - shipment credit, special financial package for large value exporters, export finance for agricultural exports, Gold Card Scheme for exporters etc. Further, banks have been granted freedom by RBI to source funds from abroad without any limit, exclusively for the purpose of granting export credit in foreign currency, which has enabled banks to increase their lending's under export credit in foreign currency substantially during the last few years.

The advances by commercial banks for export financing are in the form of:
1) Pre-shipment finance i.e. before shipment of goods
2) Post-shipment finance i.e. after shipment of goods

## Pre-shipment finance:

- This generally takes the form of packing credit facility packing credit is an advance extended by banks to an exporter for the purpose of buying , manufacturing , processing , packing , shipping goods to overseas buyers.
- Any exporter, having at hand a firm export order placed with him by his foreign buyer or an irrevocable letter of credit opened in his favor, can approach a bank for availing of packing credit. An advance so taken by an exporter is required to be liquidated within 180 days from the date of its commencement by negotiation of export bills or receipt of export proceeds in an approved manner. Thus, packing credit is essentially a short - term advance.
- Normally, banks insist upon their customers to lodge with them irrevocable letters of credit opened in favor of the customers by the overseas buyers.
- The letter of credit and firm sale contracts not only serve as evidence of a definite arrangement for realization of the export proceeds but also indicate the amount of finance required by the exporter.
- Packing credit, in the case of customers of long standing, may also be granted against firm contracts entered into by them with overseas buyers.

## Types of packing credit

### a) Clean packing credit:

- ❖ This is an advance made available to an exporter only on production of a firm export order or a letter of credit without exercising any charge or control over raw material or finished goods.
- ❖ It is a clean type of export advance.
- ❖ Each proposal is weighed according to particular requirements of the trade and credit worthiness of the exporter.
- ❖ A suitable margin has to be maintained. Also, Export Credit Guarantee Corporation (ECGC) cover should be obtained by the bank.

### b) Packing credit against hypothecation of goods:

- ❖ Export finance is made available on certain terms and conditions where the exporter has pledge able interest and the goods are hypothecated to the bank as security with stipulated margin.
- ❖ At the time of utilizing the advance, the exporter is required to submit, along with the firm export order or letter of credit relative stock statements and thereafter continue submitting them every fortnight and / or whenever there is any movement in stocks.

### c) Packing credit against pledge of goods:

- ❖ Export finance is made available on certain terms and conditions where the exportable finished goods are pledged to the banks with approved clearing agents who will ship the same from time to time as required by the exporter.
- ❖ The possession of the goods so pledged lies with the bank and is kept under its lock and key.

### d) E.C.G.C. guarantee :

- ❖ Any loan given to an exporter for the manufacture, processing, purchasing, or packing of goods meant for export against a firm order qualifies for the packing credit guarantee issued by Export Credit Guarantee Corporation.

### e) Forward exchange contract :

- ❖ Another requirement of packing credit facility is that if the export bill is to be drawn in a foreign currency, the exporter should enter into a forward exchange contract with the bank, thereby avoiding risk involved in a possible change in the rate of exchange.

## Pre-shipment finance:

### a) Purchase / discounting of documentary export bills :

- Finance is provided to exporters by purchasing export bills drawn payable at sight or by discounting usance export bills covering confirmed sales and backed by documents including documents of the title of goods such as bill of lading, post parcel receipts , or air consignment notes.

### b) E.C.G.C. Guarantee:

- Post - shipment finance, given to an exporter by a bank through purchase, negotiation or discount of an export bill against an order, qualifies for post - shipment export credit guarantee.
- It is necessary, that exporters should obtain a shipment or contracts risk policy of E.C.G.C. Banks insist on the exporters to take a contracts shipments ( comprehensive risks ) policy covering both political and commercial risks.
- The Corporation, on acceptance of the policy, will fix credit limits for individual exporters and the Corporation's liability will be limited to the extent of the limit so fixed for the exporter concerned irrespective of the amount of the policy.

### c) Advance against export bills sent for collection:

- Finance is provided by banks to exporters by way of advance against export bills forwarded through them for collection, taking into account the creditworthiness of the party, nature of goods exported, usance, standing of drawee, etc.

### d) Advance against duty draw backs, cash subsidy, etc.:

- To finance export losses sustained by exporters, bank advance against duty drawback, cash subsidy, etc., receivable by them against export performance.
- Such advances are of clean nature; hence necessary precaution should be exercised.

## Other facilities extended to the exporters are as follows:

- On behalf of approved exporters, banks establish letters of credit on their overseas or up country suppliers.
- To approved clients undertaking exports on deferred payment terms, banks also provide finance.
- Guarantees for waiver of excise duty, etc. due performance of contracts bond in lieu of cash security deposit, guarantees for advance payments etc., are also issued by banks to approved clients.
- Banks also Endeavour to secure for their exporter - customers status reports of their buyers and trade information on various commodities through their correspondents.
- Economic intelligence on various countries is also provided by banks to their exporter clients.

### 5.9 Inter Corporate Deposits:

- The companies can borrow funds for a short period; say 6 months, from other companies which have surplus liquidity.
- The rate of interest on inter corporate deposits varies depending upon the amount involved and the time period.

### 5.10 Certificate of Deposit (CD):

- The certificate of deposit is a document of title similar to a time deposit receipt issued by a bank except that there is no prescribed interest rate on such funds.
- The main advantage of CD is that banker is not required to encash the deposit before maturity period and the investor is assured of liquidity because he can sell the CD in secondary market.

### 5.11 Public Deposits:

- Public deposits are very important source of short - term and medium term finances particularly due to credit squeeze by the Reserve Bank of India.
- A company can accept public deposits subject to the stipulations of Reserve Bank of India from time to time up to a maximum amount of 35 per cent of its paid up capital and reserves.
- These deposits may be accepted for a period of six months to three years. Public deposits are unsecured loans; they should not be used for acquiring fixed assets since they are to be repaid within a period of 3 years.
- These are mainly used to finance working capital requirements.

## 6. Other sources of financing

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Other sources of financing	
Seed capital assistance	Secured premium notes
Internal cash assistance	Zero interest fully convertible debentures
Unsecured loans	Zero coupon bonds
Deferred payment guarantee	Option bonds
Capital Incentives	Inflation bonds
Deep discount bonds	Floating rate bonds

### 1) Seed capital assistance:

- The seed capital assistance scheme is designed by IDBI for professionally or technically qualified entrepreneurs and/or persons possessing relevant experience, skills and entrepreneurial traits but lack adequate financial resources.
- All the projects eligible for financial assistance from IDBI, directly through refinance are eligible under the scheme.
- The Seed Capital Assistance is interest free but carries a service charge of one per cent per annum for the first five years and at increasing rate thereafter.
- However, IDBI will have the option to charge interest at such rate as may be determined by IDBI on the loan if the financial position and profitability of the company so permits during the currency of the loan.
- The repayment. Schedule is fixed depending upon the repaying capacity of the unit with an initial moratorium up - to five years.

### 2) Internal Cash Accruals:

- Existing profit - making companies which undertake an expansion / diversification programme may be permitted to invest a part of their accumulated reserves or cash profits for creation of capital assets.
- In such cases, past performance of the company permits the capital expenditure from within the company by way of disinvestment of working / invested funds.
- In other words, the surplus generated from operations, after meeting all the contractual, statutory and working requirement of funds, is available for further capital expenditure.

### 3) Unsecured Loans:

- Unsecured loans are typically provided by promoters to meet the promoters ' contribution norm.

- These loans are subordinate to institutional loans. The rate of interest chargeable on these loans should be less than or equal to the rate of interest on institutional loans and interest can be paid only after payment of institutional dues.

- These loans cannot be repaid without the prior approval of financial institutions.

- Unsecured loans are considered as part of the equity for the purpose of calculating debt equity ratio.

#### **4) Deferred Payment Guarantee:**

- Many a time suppliers of machinery provide deferred credit facility under which payment for the purchase of machinery can be made over a period of time.
- The entire cost of the machinery is financed and the company is not required to contribute any amount initially towards acquisition of the machinery.
- Normally, the supplier of machinery insists that bank guarantee should be furnished by the buyer.
- Such a facility does not have a moratorium period for repayment. Hence, it is advisable only for an existing profit - making company.

#### **5) Capital Incentives:**

- The backward area development incentives available often determine the location of a new industrial unit.
- These incentives usually consist of a lump sum subsidy and exemption from or deferment of sales tax and octroi duty.
- The quantum of incentives is determined by the degree of backwardness of the location. The special capital incentive in the form of a lump sum subsidy is a quantum sanctioned by the implementing agency as a percentage of the fixed capital investment subject to an overall ceiling.
- This amount forms a part of the long term means of finance for the project. However, it may be mentioned that the viability of the project must not be dependent on the quantum and availability of incentives.
- Institutions, while appraising the project, assess the viability of the project per se, without considering the impact of incentives on the cash flows and profitability of the project.
- Special capital incentives are sanctioned and released to the units only after they have complied with the requirements of the relevant scheme.
- The requirements may be classified into initial effective steps and final effective steps.

#### **6) Deep Discount Bonds:**

- Deep Discount Bonds is a form of zero - interest bonds. These bonds are sold at a discounted value and on maturity; face value is paid to the investors.
- In such bonds, there is no interest payout during lock in period.

#### **7) Secured Premium Notes:**

- Secured Premium Notes is issued along with detachable warrant and is redeemable after a notified period of say 4 to 7 years.
- The conversion of detachable warrant into equity shares will have to be done within time period notified by the company.

#### **8) Zero Interest Fully Convertible Debentures:**

- These are fully convertible debentures which do not carry any interest.
- The debentures are compulsorily and automatically converted after a specified period of time and holders thereof are entitled to new equity shares of the company at predetermined price.
- From the point of view of company, this kind of instrument is beneficial in the sense that no interest is to be paid on it. If the share price of the company in the market is very high then the investors tends to get equity shares of the company at the lower rate.

#### **9) Zero Coupon Bonds:**

- A Zero Coupon Bond does not carry any interest but it is sold by the issuing company at a discount.



- The difference between the discounted value and maturing or face value represents the interest to be earned by the investor on such bonds.

**10) Option Bonds:** These are cumulative and non - cumulative bonds where interest is payable on maturity or periodically. Redemption premium is also offered to attract investors.

**11) Inflation Bonds:**

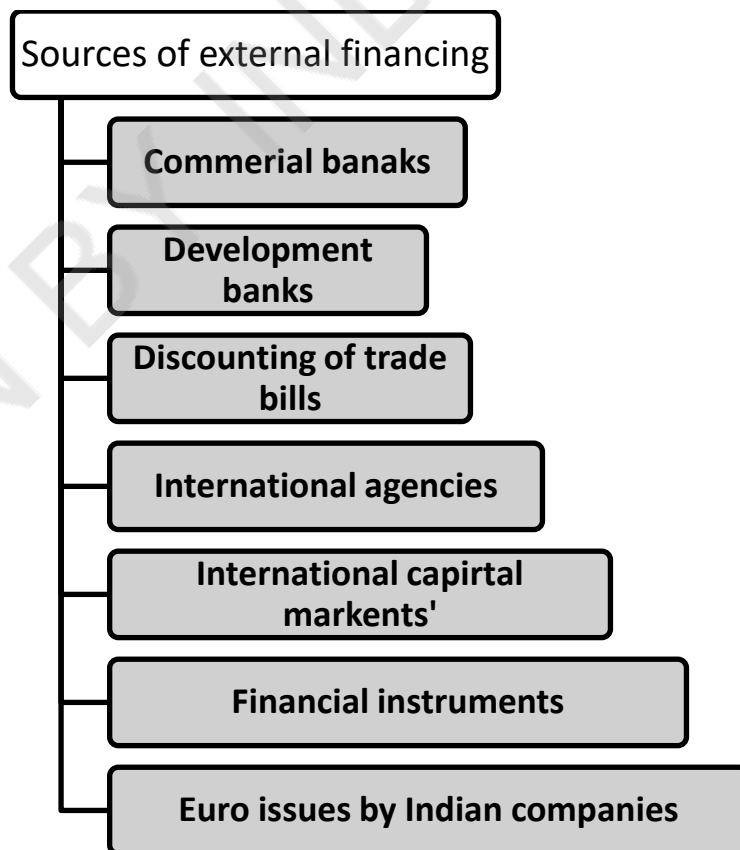
- Inflation Bonds are the bonds in which interest rate is adjusted for inflation. Thus, the investor gets interest which is free from the effects of inflation.
- For example, if the interest rate is 11 per cent and the inflation is 5 per cent, the investor will earn 16 per cent meaning thereby that the investor is protected against inflation.

**12) Floating Rate Bonds:**

- This as the name suggests is bond where the interest rate is not fixed and is allowed to float depending upon the market conditions. This is an ideal instrument which can be resorted to by the issuer to hedge themselves against the volatility in the interest rates.
- This has become more popular as a money market instrument and has been successfully issued by financial institutions like IDBI, ICICI etc.

**7. International Financing:**

There are various avenues for organizations to raise funds either through internal or external sources. The sources of external financing include:



### **Commercial Banks:**

- Like domestic loans, commercial banks all over the world extend Foreign Currency (FC) loans also for international operations.
- These banks also provide to overdraw over and above the loan amount.

### **Development Banks:**

- Development banks offer long & medium term loans including FC loans.
- Many agencies at the national level offer a number of concessions to foreign companies to invest within their country and to finance exports from their countries e.g. EXIM Bank of USA.

### **Discounting of Trade Bills:**

- This is used as a short - term financing method.
- It is used widely in Europe and Asian countries to finance both domestic and international business.

### **International Agencies:**

- A number of international agencies have emerged over the years to finance international trade & business.
- The more notable among them include The International Finance Corporation ( IFC ) , The International Bank for Reconstruction and Development ( IBRD ) , The Asian Development Bank ( ADB ) , The International Monetary Fund ( IMF ) , etc.

### **International Capital Markets:**

- Today, modern organizations including MNC's depend upon sizeable borrowings in Rupees as well as Foreign. Currency (FC).
- In order to cater to the needs of such organizations, international capital markets have sprung all over the globe such as in London.

In international capital market, the availability of FC is available under the four main systems viz:

- ✓ Euro - currency market.
- ✓ Export credit facilities
- ✓ Bonds issues
- ✓ Financial Institutions.
- The origin of the Euro - currency market was with the dollar denominated bank deposits and loans in Europe particularly in London.
- Euro - dollar deposits are dollar denominated time deposits available at foreign branches of US banks and at some foreign banks.
- Banks based in Europe accept dollar denominated deposits and make dollar denominated deposits to the clients.
- This forms the backbone of the Euro - currency market all over the globe. In this market, funds are made available as loans through syndicated Euro - credit of instruments such as FRN's, FR certificates of deposits.

**Financial instruments:** Some of the financial instruments are given below:

Financial Instruments	
External Commercial borrowings	Foreign currency option
Euro Bonds	Foreign currency futures
Foreign Bonds	Foreign euro bonds
Fully hedged Bonds	Euro convertible bonds
Medium term notes	Euro convertible zero bonds
Floating rate notes	Euro bonds with equity warrants
Euro commercial papers	Environmental, social and governance-linked bonds and Euro issues by Indian companies.

**a) External Commercial Borrowings ( ECB ) :**

ECBs refer to commercial loans ( in the form of bank loans , buyers credit , suppliers credit , securitized instruments ( e.g. floating rate notes and fixed rate bonds ) availed from non - resident lenders with minimum average maturity of 3 years. Borrowers can raise ECBs through internationally recognized sources like

- (i) International banks,
- (ii) International capital markets,
- (iii) Multilateral financial institutions such as the IFC, ADB etc,
- (iv) Export credit agencies,
- (v) Suppliers of equipment,
- (vi) Foreign collaborators and
- (vii) Foreign equity holders.

External Commercial Borrowings can be accessed under two routes viz

- (i) Automatic route and
- (ii) Approval route. Under the Automatic route, there is no need to take the RBI / Government approval whereas such approval is necessary under the Approval route. Company's registered under the Companies Act and NGOs engaged in micro finance activities are eligible for the Automatic Route whereas Financial Institutions and Banks dealing exclusively in infrastructure or export finance and the ones which had participated in the textile and steel sector restructuring packages as approved by the government are required to take the Approval Route.

**b) Euro Bonds:**

- Euro bonds are debt instruments which are not denominated in the currency of the country in which they are issued e.g. a Yen note floated in Germany.
- Such bonds are generally issued in a bearer form rather than as registered bonds and in such cases they do not contain the investor's names or the country of their origin.
- These bonds are an attractive proposition to investors seeking privacy.

**c) Foreign Bonds:**

- These are debt instruments issued by foreign corporations or foreign governments. Such bonds are exposed to default risk, especially the corporate bonds.

- These bonds are denominated in the currency of the country where they are issued, however, in case these bonds are issued in a currency other than the investors home currency, they are exposed to exchange rate risks. An example of a foreign bond is a British firm placing Dollar denominated bonds in USA.
- d) Fully Hedged Bonds:**
- As mentioned above, in foreign bonds, the risk of currency fluctuations exists.
  - Fully hedged bonds eliminate the risk by selling in forward markets the entire stream of principal and interest payments.
- e) Medium Term Notes (MTN):**
- Certain issuers need frequent financing through the Bond route including that of the Euro bond. However, it may be costly and ineffective to go in for frequent issues. Instead, investors can follow the MTN programme.
  - Under this programme, several lots of bonds can be issued, all having different features e.g. different coupon rates, different currencies etc.
  - The timing of each lot can be decided keeping in mind the future market opportunities.
  - The entire documentation and various regulatory approvals can be taken at one point of time.
- f) Floating Rate Notes (FRN):**
- These are issued up to seven years maturity.
  - Interest rates are adjusted to prevailing exchange rates.
  - They provide cheaper money than foreign loans.
- g) Euro Commercial Papers (ECP):**
- ECPs are short term money market instruments.
  - They have maturity period of less than one year.
  - They are usually designated in US Dollars.
- h) Foreign Currency Option (FC):**
- A FC Option is the right (and not the obligation) to buy or sell foreign currency at a certain specified price on or before a specified date.
  - It provides a hedge against financial and economic risks.
- i) Foreign Currency Futures:**
- FC Futures are obligations (and not the right) to buy or sell a specified foreign currency in the present for settlement at a future date.
- j) Foreign Euro Bonds :**
- In domestic capital markets of various countries the Bonds issues referred to above are known by different names such as Yankee Bonds in the US, Swiss Francs in Switzerland, Samurai Bonds in Tokyo and Bulldogs in UK.
- k) Euro Convertible Bonds:**
- A convertible bond is a debt instrument which gives the holders of the bond an option to convert the bonds into a pre-determined number of equity shares of the company.
  - Usually the price of the equity shares at the time of conversion will have a premium element. These bonds carry a fixed rate of interest and if the issuer company so desires may also include a Call Option (where the issuer company has the option of calling / buying the bonds for redemption prior to the maturity date) or a Put Option (which gives the holder the option to put / sell his bonds to the issuer company at a pre-determined date and price).
- l) Euro Convertible Zero Bonds:**
- These bonds are structured as a convertible bond.
  - No interest is payable on the bonds. But conversion of bonds takes place on maturity at a pre-determined price.
  - Usually there is a five years maturity period and they are treated as a deferred equity issue.

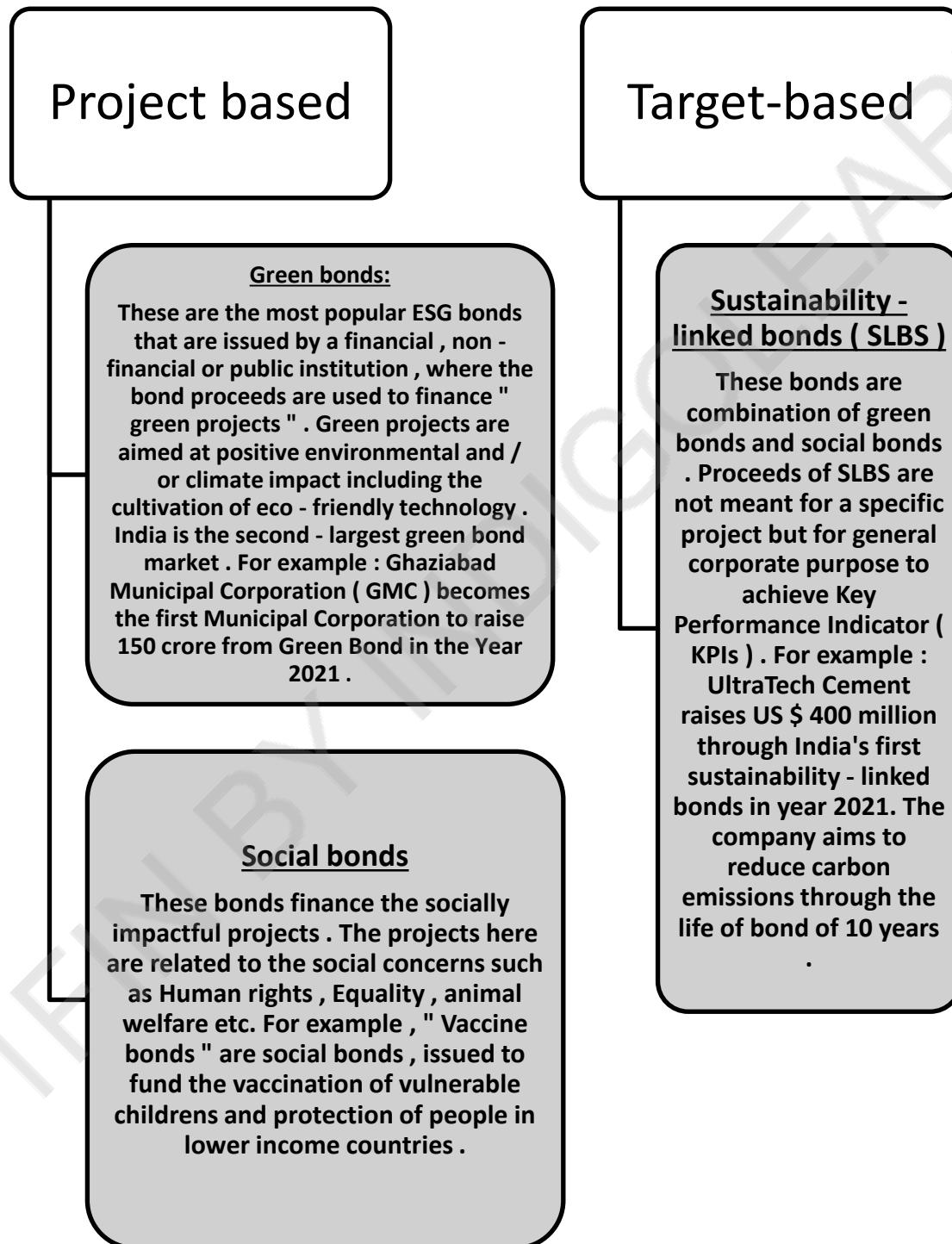
**m) Euro Bonds with Equity Warrants:**

- These bonds carry a coupon rate determined by market rates.
- The warrants are detachable.
- Pure bonds are traded at a discount.
- Fixed Income Funds Management may like to invest for the purposes of regular income in this case.

**n) Environmental , Social and Governance linked bonds ( ESG ) :**

- These bonds carry a responsibility of the issuer company to prioritize optimal environmental, social and governance (ESG) factors.
- Investing in ESG bonds is considered as socially responsible investing.
- ESG bonds can be project-based-green bonds and social bonds; and target-based-sustainability-linked bonds (SLBs).

ESG bonds are given below:



### **Euro issues by Indian companies:**

Indian companies are permitted to raise foreign currency resources through issue of ordinary equity shares through Global Depository Receipts (GDRs) / American Depository Receipts (ADRs) and / or issue of Foreign Currency Convertible Bonds (FCCB) to foreign. Investors i.e. institutional investors or individuals (including NRIs) residing abroad. Such investment is treated as Foreign Direct Investment (FDI). The government guidelines on these issues are covered under the Foreign. Currency Convertible Bonds and Ordinary Shares (through depository receipt mechanism) Scheme, 1993 and notifications issued after the implementation of the said scheme.

- (a) American Depository Receipts (ADRs)
- (b) Global depository receipts (GDRs)
- (c) Indian Depository receipts (IDRs)

### **American Depository Receipts (ADRs)**

- These are securities offered by non - US companies who want to list on any of the US exchange. Each ADR represents a certain number of a company's regular shares.
- ADRs allow US investors to buy shares of these companies without the costs of investing directly in a foreign stock exchange. The Indian companies have preferred the GDRs to ADRs because the US market exposes them to a higher level of responsibility than a European listing in the areas of disclosure, costs, liabilities and timing.
- The regulations are somewhat more stringent and onerous, even for companies already listed and held by retail investors in their home country.
- The most onerous aspect of a US listing for the companies is to provide full, half yearly and quarterly accounts in accordance with, or at least reconciled with US GAAPs.

### **Global depository receipts (GDRs)**

- These are negotiable certificates held in the bank of one country representing a specific number of shares of a stock traded on the exchange of another country.
- These financial instruments are used by companies to raise capital in either dollars or Euros. These are mainly traded in European countries and particularly in London.

### **ADRs / GDRs and the Indian Scenario:**

Infosys Technologies was the first Indian company to be listed on Nasdaq in 1999. However, the first Indian firm to issue sponsored GDR or ADR was Reliance industries Limited. Beside these two companies there are several other Indian firms which are also listed in the overseas bourses. These are Wipro, MTNL, State Bank of India, Tata Motors, Dr. Reddy's Lab, etc.

### **Indian depository receipts (IDRs)**

- The concept of the depository receipt mechanism which is used to raise funds in foreign currency has been applied in the Indian Capital Market through the issue of Indian Depository Receipts (IDRS).
- IDRS are similar to ADRs / GDRs in the sense that foreign companies can issue IDRs to raise funds from the Indian Capital Market in the same lines as an Indian company uses ADRs / GDRs to raise foreign capital.
- The IDRs are listed and traded in India in the same way as other Indian securities are traded.

### 1. Ratios and ratio analysis

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#### 1.1 Definition of Ratio:

A ratio is defined as “the indicated quotient of two mathematical expressions and as the relationship between two or more things.”

Here, ratio means financial ratio or accounting ratio which is a mathematical expression of the relationship between two accounting figures.

#### 1.2 Ratio analysis:

The term financial ratio can be explained by defining how it is calculated and what the objective of this calculation is?

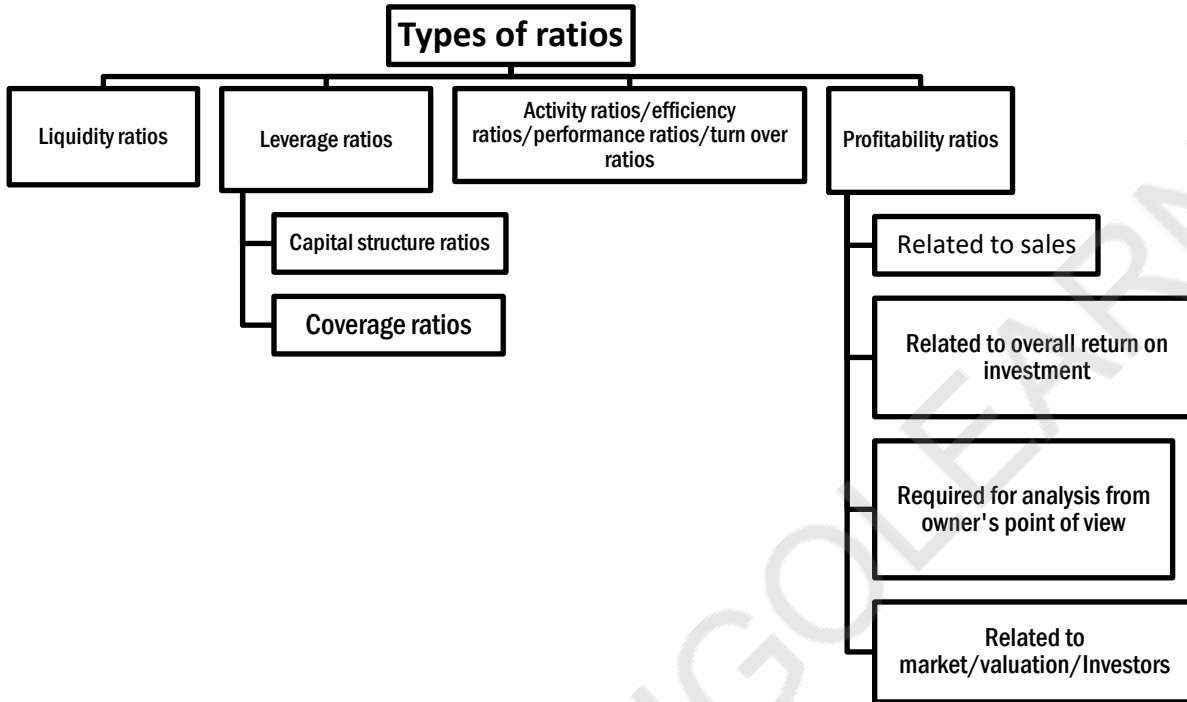
- a) Calculation Basis ( Basis of Calculation ) :
  - A relationship expressed in mathematical terms
  - Between two individual figures or group of figures
  - Connected with each other in some logical manner
  - Selected from financial statements of the concern
- b) Objective for financial ratios is that all stakeholders can draw conclusions about the :
  - Performance ( past , present and future )
  - Strengths & weaknesses of a firm
  - Can take decisions in relation to the firm

#### 1.3 Sources of financial data for analysis:

- The sources of information for financial statement analysis are: Business periodicals.
- Annual Reports
- Interim financial statements
- Notes to Accounts
- Statement of cash flows
- Credit and investment advisory services



## 2. Types of Ratios:



### 2.1 Liquidity ratios:

- Liquidity or short - term solvency means ability of the business to pay its short - term liabilities.
- Inability to pay - off short - term liabilities affects its credibility as well as its credit rating.
- Continuous default on the part of the business leads to commercial bankruptcy.
- Eventually such commercial bankruptcy may lead to its sickness and dissolution.
- Short - term lenders and creditors of a business are very much interested to know its state of liquidity because of their financial stake. Both lack of sufficient liquidity and excess liquidity is bad for the organization.

Various Liquidity Ratios are:

- Current Ratio
- Quick Ratio or Acid test Ratio
- Cash Ratio or Absolute Liquidity Ratio
- Basic Defense Interval or Interval Measure Ratios
- Net Working Capital

### Current Ratio:

The Current Ratio is one of the best known measures of short term solvency. It is the most common measure of short term liquidity.

Formula	Interpretation
Current ratio = current assets / current liabilities  Where,	A generally acceptable current ratio is 2: 1. But whether or not a specific ratio is satisfactory

<p>Current Asset = Inventories + Sundry Debtors + Cash and Bank Balances + Receivables / Accruals Loans and Advances + Disposable Investments + Any other current assets.</p> <p>Current Liabilities = Creditors for goods and services + Short - term Loans + Bank Overdraft Cash Credit + Outstanding Expenses + Provision for Taxation Proposed Dividend + Unclaimed Dividend + Any other current liabilities.</p>	<p>depends on the nature of the business and the characteristics of its current assets and liabilities.</p>
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**Quick ratio:**

The Quick Ratio is sometimes called the " acid - test " ratio and is one of the best measures of liquidity.

Formula	Interpretation
<p>Quick ratio or Acid test Ratio =</p> <p>Quick assets / current liabilities.</p> <p>Where,</p> <p>Quick Assets = Current Assets - Inventories - Prepaid expenses</p> <p>Current liabilities = As mentioned under Current Ratio</p>	<p>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.</p>

**Cash ratio/ Absolute liquidity ratio:**

The cash ratio measures the absolute liquidity of the business. The ratio considers only the absolute liquidity available with the firm.

Formula	Interpretation
<p>Cash ratio</p> <p>= (cash and bank balance + marketable securities) / current liabilities</p> <p>Or</p>	<p>The absolute liquidity ratio only tests short term liquidity in terms of cash and marketable securities/current investments.</p>

$= \frac{(\text{cash and bank balance} + \text{Current investments})}{\text{current liabilities}}$	
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**Basic defense interval:**

Formula	Interpretation
<p>Basic defense interval</p> $= \frac{(\text{cash and bank balance} + \text{net receivables} + \text{marketable Securities})}{(\text{operating expenses} \div \text{No of days})}$ <p>Or</p> $= \frac{(\text{current assets} - \text{prepaid expenses} - \text{inventories})}{\text{daily operating expenses}}$ <p>Where,</p> <p>Daily operating expense</p> $= \frac{(\text{cost of goods sold} + \text{selling, administration and other general expenses} - \text{depreciation and other non cash expenditure})}{\text{No of days in a year.}}$	<p>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</p>

**Net Working Capital:**

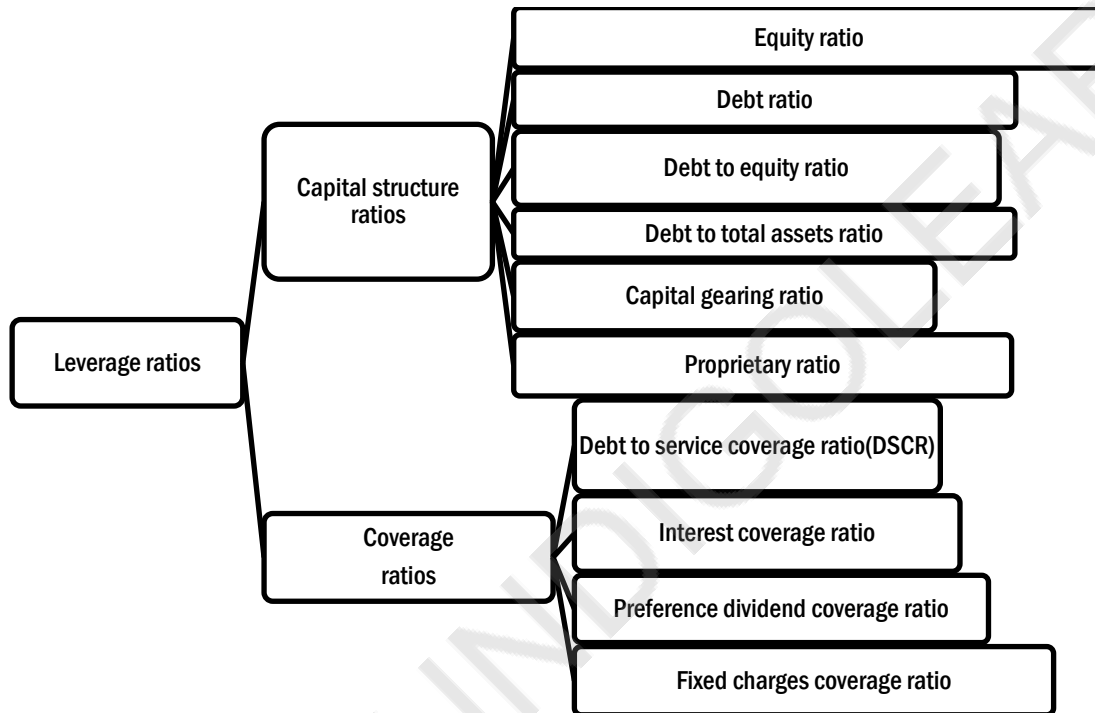
Net working capital is more a measure of cash flow than a ratio. The result of this calculation must be a positive number. However, in certain business models it may be negative. It is calculated as shown below:

Formula	Interpretation
<p>Net working capital</p> $= \text{current assets} - \text{current liabilities.}$	<p>Bankers look at net working capital over time to determine a company's ability to whether financial crises. Loans are often tied to minimum working capital requirements.</p>

## 2.2 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 .



### Capital structure ratios:

The following are the various capital structure ratios

#### **Equity ratio:**

Formula	Interpretation
<p>Equity ratio = share holder's equity / net assets</p> <p>Where,</p> <p>Share holder's equity = equity share capital and reserves and surplus (excluding fictitious assets)</p> <p>Net assets or capital employed = net fixed assets and net current assets(current assets – current liabilities)</p>	<p>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.</p>

#### **Debt ratio:**

Formula	Interpretation
Debt ratio = Total debt / net assets Where, Total debt or total outside liabilities = short and long term borrowings from financial institutions, debentures/bonds, deferred payment arrangements for buying capital equipment, bank borrowings, public deposits and any other interest bearing loan.	This ratio is used to analyze 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.

**Debt to equity ratio:**

Formula	Interpretation
Debt to equity ratio = total outside liabilities / shareholder's equity = total debt / shareholder's equity = long term debt / shareholder's equity	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.

**Debt to total assets ratio:**

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

Formula	Interpretation
Debt to total assets ratio = total outside liabilities / total assets Or = total debt / total assets.	Higher the ratio indicates that assets are less backed up by equity and hence higher financial leverage.

### **Capital gearing ratio:**

formula	Interpretation
Capital gearing ratio  = (preference share capital + debenture + other borrowed funds) / (equity share capital + reserves&surplus – losses)	In addition to debt - equity ratio , sometimes capital gearing ratio is also calculated to show the proportion of fixed interest ( dividend ) bearing capital to funds belonging to equity shareholders i.e. equity funds or net worth . Again, higher ratio may indicate more risk.

### **Proprietary ratio:**

Formula	Interpretation
Proprietary ratio  = proprietary fund / total assets  Where,  Proprietary fund = equity share capital, preference share capital and reserves and surplus.  Total assets exclude fictitious assets and losses.	It indicates the proportion of total assets financed by shareholders. Higher the ratio, less risky scenario it shall be.

### **Coverage ratios:**

The coverage ratios measure the firm's ability to service the fixed liabilities. These ratios establish the relationship between fixed claims and what is normally available out of which these claims are to be paid. The fixed claims consist of:

- Interest on loans
- Preference dividend
- Amortization of principal or repayment of the installment of loans or redemption of preference capital on maturity.

The following are important coverage ratios:

### **Debt service coverage ratio(DSCR):**

Lenders are interested in debt service coverage to judge the firm's ability to pay off current interest and installments.

Formula	Interpretation
Debt service coverage ratio  = earnings available for debt services / (interest + installments)	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.

<p>Where,</p> <p>Earnings available for debt service</p> <p>= Net profit(Earning after taxes) + non-cash operating expenses like depreciation and other amortizations + interest + other adjustments like loss on sale of fixed asset etc.,</p>	
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**Interest coverage ratio:**

This ratio also known as “times interest earned ratio” indicates the firm's ability to meet interest (and other fixed charges) obligations. This ratio is computed as:

Formula	Interpretation
<p>Interest coverage ratio</p> <p>= EBIT / Interest</p>	<p>Earnings before interest and taxes are used in the numerator of this ratio because the ability to pay interest is not affected by tax burden as interest on debt funds is deductible expense. It measures how many times a company can cover its current interest payment with its available earnings? In other words, it reflects the margin of safety a company has for paying interest on its debt during a given period. 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</p>

**Preference dividend coverage ratio:**

This ratio measures the ability of a firm to pay dividend on preference shares which carry a stated rate of return. This ratio is computed as:

Formula	Interpretation
<p>Preference dividend coverage ratio</p> <p>= [Net profit / earnings after taxes (EAT)] / preference dividend</p> <p>Similarly,</p> <p>Equity dividend coverage ratio</p> <p>= EAT – preference dividend / equity dividend</p>	<p>The Preference dividend coverage ratio indicates margin of safety available to the preference shareholders. A higher ratio is desirable from preference shareholders point of view.</p>

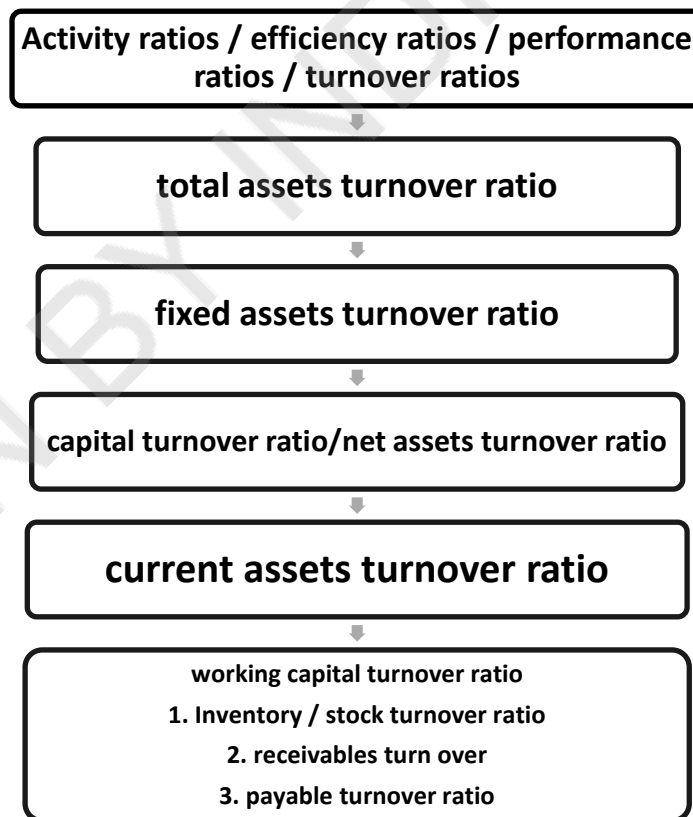
**Fixed charges coverage ratio:**

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

Formula	Interpretation
Fixed charges coverage ratio $= (\text{EBIT} + \text{Depreciation}) / \text{interest} + \text{repayment of loan}$  EBIT = PBIT (profit before interest and taxes)	Ratios shall be calculated based on requirement and availability of information and may deviate from original formulae. If required, assumptions should be given. Numerator should be taken in correspondence with the denominator and vice-versa.

### 2.3 Activity ratios / efficiency ratios / performance ratios / turnover ratios:

These ratios are employed to evaluate the efficiency with which the firm manages and utilizes its assets. For this reason, they are often called as ' Asset management ratios '. These ratios usually indicate the frequency of sales with respect to its assets. These assets may be capital assets or working capital or average inventory.



These ratios are usually calculated with reference to sales/cost of goods sold and are expressed in terms of rate or times.



### **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	Interpretation
Total asset turnover ratio $= (\text{sales}/\text{cost of goods sold}) / \text{total assets}$	A higher total assets turnover ratio indicates the efficient utilization of total assets in generation of sales. Similarly, a low asset turnover ratio indicates total assets are not efficiently used to generate sales.

### **Fixed asset turnover ratio:**

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

Formula	Interpretation
Fixed assets turnover ratio $= (\text{sales}/\text{cost of goods sold}) / \text{fixed assets}$	A high fixed assets turnover ratio indicates efficient utilization 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.

### **Capital turnover ratio/ net asset turnover ratio:**

Formula	Interpretation
Capital turnover ratio $= (\text{sales}/\text{cost of goods sold}) / \text{net assets}$	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 utilization of owner's and long - term creditors ' funds .

### **Current assets turnover ratio:**

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

Formula	Interpretation
Current assets turnover ratio	The higher the ratio, the more efficient is the utilization of current assets in generating sales.

= (sales/cost of goods sold) / current assets	
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**Working capital turnover ratio:**

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

Formula	Interpretation
Working capital turnover ratio $= (\text{sales/cost of goods sold}) / \text{working capital}$	Higher the ratio, the more efficient is the utilization 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 Capital also can be taken in the denominator for the above ratios.

**Inventory/stock turnover ratio:**

This ratio also known as stock turnover ratio establishes the relationship between the cost of goods sold during the year and average inventory held during the year. It measures the efficiency with which a firm utilizes or manages its inventory. It is calculated as follows:

formula	Interpretation
Inventory turnover ratio $= (\text{cost of goods sold/sales}) / \text{average inventory}$  Where, $\text{Average inventory} = (\text{opening stock} + \text{closing stock})/2$  Raw material Inventory turnover ratio $= \text{raw material consumed} / \text{average raw material stock}$	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.

### **Receivables (Debtor's) turnover ratio:**

In case firm sells goods on credit, the realization of sales revenue is delayed and the receivables are created. The cash is realized from these receivables later on. The speed with which these receivables are collected affects the liquidity position of the firm. The debtor's turnover ratio throws light on the collection and credit policies of the firm. It measures the efficiency with which management is managing its accounts receivables. It is calculated as follows:

Formula	Interpretation
Receivables turnover ratio  = credit sales / average accounts receivables	A low debtor's turnover ratio reflects liberal credit terms granted to customers, while a high ratio shows that collections are made rapidly.

### **Receivables (Debtor's) velocity/average collection period:**

Debtor's turnover ratio indicates the average collection period. However, the average collection period can be directly calculated as follows:

Formula	Interpretation
Receivables (Debtor's) velocity/average collection period  = average accounts receivables / average daily credit sales  Or  = (12 months / 52 weeks / 360 days) / receivable turnover ratio  Where,  Average daily credit sales  = credit sales / no. of days in year	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.

### **Payables turnover ratio:**

This ratio is calculated on the same lines as receivable turnover ratio is calculated. It measures how fast a company makes payment to its creditors. It shows the velocity of payables payment by the firm. It is calculated as follows:

Formula	Interpretation
Payables turnover ratio = annual net credit purchases / average accounts payables	A low creditor's turnover ratio reflects liberal credit terms granted by suppliers, while a high ratio shows that accounts are settled rapidly.

**Payable velocity/average payment period:**

Formula	Interpretation
= average accounts payable / average daily credit purchases  Or = (12 months/52 weeks / 360 days) / Payable turnover ratio	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. The above three ratios i.e. Inventory Turnover Ratio / Receivables Turnover Ratio / Payables Turnover Ratio are also relevant to examine liquidity of an organization.

**2.4 Profitability ratios:**

The profitability ratios are broadly classified in four categories.

1. Profitability ratios related to sales
2. Profitability ratios related to overall return on investment
3. Profitability ratios related for Analysis from owner's point of view
4. Profitability ratios related to market/valuation/investors

**2.4.1 Profitability ratio based on sales:**

**Gross profit ratio/ margin:**

It measures the percentage of each sale in rupees remaining after payment for the goods sold.

Formula	Interpretation
GP ratio = (GP/Sales)*100	GP margin depends on the relationship between sales price, volume and costs. A high gross profit margin is a favorable sign of good management.

**Net profit ratio/ net profit margin:**

It measures the relationship between net profit and sales of the business. Depending on the concept of net profit, it can be calculated as:

Formula	Interpretation
NP ratio $= ( \text{net profit} / \text{sales} ) * 100$ Or $= ( \text{earnings after taxes} / \text{sales} ) * 100$ Pre- tax profit ratio $= ( \text{earnings before taxes} / \text{sales} ) * 100$	NP ratio finds the proportion of revenue that finds its way into profits after meeting all expenses. A high net profit ratio indicates positive returns from the business.

**Operating profit ratio:**

Formula	Interpretation
$= ( \text{operating} / \text{sales} ) * 100$ Or $= ( \text{EBIT} / \text{sales} ) * 100$ Where, Operating profit = sales – COGS – operating expenses	Operating profit ratio measures the percentage of each sale in rupees that remains after the payment of all costs and expenses except for interest and taxes. This ratio is followed closely by analysts because it focuses on operating results. Operating profit is often referred to as earnings before interest and taxes or EBIT.

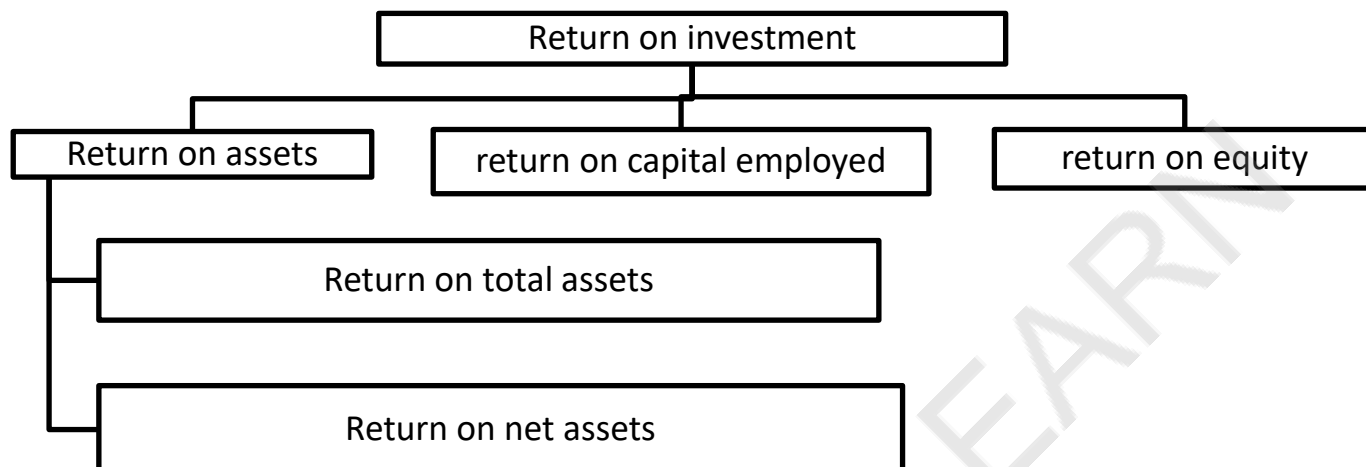
**Expenses ratio:**

Based on different concepts of expenses it can be expressed in different variants as below:

Formulas
COGS ratio = $( \text{COGS} / \text{sales} ) * 100$
Operating expenses ratio = $[ ( \text{admin exp} + \text{selling \& distribution OH} ) / \text{sales} ] * 100$
Operating ratio = $[ ( \text{COGS} + \text{Operating expenses} ) / \text{sales} ] * 100$
Financial expenses ratio = $( \text{financial expenses} / \text{sales} ) * 100$

# it excludes taxes, loss due to theft, goods destroyed by fire etc.

### 2.4.2 Profitability ratios related to overall return on investment:



#### Return on investment (ROI):

ROI is the most important ratio of all. It is the percentage of return on funds invested in the business by its owners. In short, this ratio tells the owner whether or not all the effort put into the business has been worthwhile. It compares earnings / returns / profit with the investment in the company. The ROI is calculated as follows:

Return on investment = [(Return/profit/earning) ÷ Investment] * 100 Or = [(return/profit/earnings) ÷ sales] * [sales ÷ investment] Or = profitability ratio * investment turnover ratio
Profitability ratio = [return/profit/earnings] ÷ sales
Investment turnover ratio = sales ÷ Investments

#### Return on Assets (ROA):

The profitability ratio is measured in terms of relationship between net profits and assets employed to earn that profit. This ratio measures the profitability of the firm in terms of assets employed in the firm. Based on various concepts of net profit (return) and assets, the ROA may be measured as follows:

= (net profit after taxes + interest) ÷ average assets/average tangible assets/average fixed assets Or
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=  $[\text{EBIT}(1-t)] \div \text{average total assets}$ (also known as return on total assets)

Or

=  $[\text{EBIT}(1-t)] \div \text{average net assets}$ (also known as return on net assets)

**Return on capital employed:**

Formula	Interpretation
<p>Pre tax = <math>[\text{EBIT} \div \text{capital employed}] * 100</math></p> <p>Post tax = <math>[\text{EBIT}(1-t) \div \text{capital employed}] * 100</math></p> <p>Or</p> <p>= <math>([\text{net profit after taxes} + \text{interest}] \div \text{capital employed}) * 100</math></p> <p>Where,</p> <p>Capital employed</p> <p>= Total assets – current liabilities</p> <p>Or</p> <p>= fixed assets + working capital</p> <p>Or</p> <p>= equity + long term debt</p>	<p>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.</p>

## **Return on equity (ROE):**

Return on Equity measures the profitability of equity funds invested in the firm. This ratio reveals how profitably of the owners' funds have been utilized by the firm. It also measures the percentage return generated to equity shareholders. This ratio is computed as:

Formula	Interpretation
ROE  = $\frac{[\text{NP after taxes} - \text{preference dividend}]}{\text{net worth/ equity shareholders funds}} \times 100$	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.

## **Return on equity using the Du Pont model:**

A finance executive at E.I. Du Pont de Nemours and Co., of Wilmington, Delaware, created the DuPont system of financial analysis in 1919. That system is used around the world today and serves as the basis of components that make up return on equity. There are various components in the calculation of return on equity using the traditional DuPont model- the net profit margin, asset turnover, and the equity multiplier. By examining each input individually, the sources of a company's return on equity can be discovered and compared to its competitors. The components are as follows:

### **1. Profitability/net profit margin:**

- The net profit margin is simply the after tax profit a company generates for each rupee of revenue.
- Net profit margin varies across industries, making it important to compare a potential investment against its competitors.
- Although the general rule - of - thumb is that a higher net profit margin is preferable, it is not uncommon for management to purposely lower the net profit margin in a bid to attract higher sales.
- Net profit margin is a safety cushion; the lower the margin, the less room for an error. A business with 1 % margin has no room for flawed execution.
- Small miscalculations on management's part could lead to tremendous losses with little or no warning.

$$\text{Profitability / NP margin} = \frac{\text{profit}}{\text{net income}} \div \frac{\text{sales}}{\text{revenue}}$$



Net profit margin is a safety cushion; the lower the margin, the less room for an error. A business with 1 % margin has no room for flawed execution. Small miscalculations on management's part could lead to tremendous losses with little or no warning.

## 2. **Investment turnover/asset turnover/ capital turnover:**

- The asset turnover ratio is a measure of how effectively a company converts its assets into sales.
- The asset turnover ratio tends to be inversely related to the net profit margin i.e. higher the net profit margin, lower the asset turnover and vice versa.
- The result is that the investor can compare companies using different models (low - profit, high volume vs. high - profit, low - volume) and determine which one is the more attractive business.

$$\text{Investment turnover} = \text{sales/revenue} \div \text{Investment/assets/capital}$$

## 3. **Equity multiplier:**

- It is possible for a company with terrible sales and margins to take on excessive debt and artificially increase its return on equity. The equity multiplier, a measure of financial leverage, allows the investor to see what portion of the return on equity is the result of debt.
- The equity multiplier is calculated as follows :

$$\text{Equity multiplier} = (\text{Investment} / \text{asset} / \text{capital}) \div \text{shareholder's equity}$$

## **Calculation of return on equity:**

To calculate the return on equity using the DuPont model, simply multiply the three components (net profit margin, asset turnover, and equity multiplier.)

$$\text{Return on equity} = (\text{profitability/ net profit margin}) * (\text{Investment turnover/asset turnover/capital turnover}) * \text{equity multiplier.}$$

### **2.4.3 Profitability ratios required for analysis from owner's point of view:**

#### **Earnings per share (EPS):**

The profitability of a firm from the point of view of ordinary shareholders can be measured in terms of earnings per share basis.

$$\text{EPS} = \text{net profit available to equity shareholders} \div \text{No. of equity shares out standing}$$

#### **Dividend per share (DPS):**

Earnings per share as stated above reflects the profitability of a firm per share, it does not reflect how much profit is paid as dividend and how much is retained by the business. Dividend per share ratio indicates the amount of profit distributed to equity shareholders per share.

$$\text{DPS} = \text{Total dividend paid to equity shareholders} \div \text{No. of equity shares out standing}$$

**Dividend pay-out ratio (DP):**

This ratio measures the dividend paid in relation to net earnings. It is determined to see to how much extent earnings per share have been retained by the management for the business.

$$\text{DP} = \text{DPS} \div \text{EPS}$$

**2.4.4 Profitability ratio related to market/ valuation/ Investors:**

These ratios consider the market value of the company's shares in calculation. Frequently, share prices data are punched with the accounting data to generate new set of information. These are

- (a) Price- Earnings Ratio,
- (b) Dividend Yield,
- (c) Market Value / Book Value per share,
- (d) Q Ratio.

**Price-earnings ratio (PE ratio):**

The price earnings ratio indicates the expectation of equity investors about the earnings of the firm. It relates earnings to market price and is generally taken as a summary measure of growth potential of an investment, risk characteristics, shareholders orientation, corporate image and degree of liquidity.

Formula	Interpretation
P/E ratio = Market price per share ÷ EPS	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.

**Dividend and Earning yield:**

Formula	Interpretation
Dividend yield = [(Dividend+/- change in share price) ÷ Initial share price]*100 Or	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.

<p>= <math>[\text{Dividend per share} \div \text{Market price per share}] * 100</math></p> <p>Earnings yield or earnings price ratio</p> <p>= <math>[\text{EPS} \div \text{market price per share}] * 100</math></p>	
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**Market value / book value per share (MV/BV):**

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

Formula	Interpretation
<p>MV / BV</p> <p>= <math>\text{Average share price} \div (\text{net worth} \div \text{No. of equity shares})</math></p> <p>Or</p> <p>= <math>\text{Closing share price} \div (\text{net worth} \div \text{No. of equity shares})</math></p>	<p>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.</p>

**Q Ratio:**

This ratio is proposed by James Tobin,

Formula	Interpretation
<p>Q Ratio</p> <p>= <math>\text{Market value of equity and liabilities} \div \text{Estimated replacement cost of assets}</math></p> <p>Or</p> <p>= <math>\text{Market value of a company} \div \text{Assets replacement cost}</math></p>	<p>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.</p>

### 3. Users and objective of financial analysis – A bird’s eye view

Users	Objectives	Ratios used in general
Share holders	Being owners of the organisation they are interested to know about profitability and growth of the organization.	Mainly profitability ratios ( In particular EPS, DPS, P/E, Dividend payout ratio)
Investors	They are interested to know overall financial health of the organization particularly future perspective of the organizations.	<ul style="list-style-type: none"> <li>• Profitability ratios</li> <li>• Capital structure ratios</li> <li>• Solvency ratios</li> <li>• Turnover ratios</li> </ul>
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>
Creditors	They are interested to know liability position of the organization particularly in short term. Creditors would like to know whether the organization 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</li> </ul>
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 term solvency ratios</li> <li>• Profitability ratio</li> <li>• Return on investment</li> </ul>
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>
<b>Managers</b>		
Production managers	They are interested to 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>
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>

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>
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>
<b>Different Industry</b>		
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>
Bank		<ul style="list-style-type: none"> <li>• Loan to deposit ratios</li> <li>• Operating expenses and income ratios</li> </ul>
Hotel		<ul style="list-style-type: none"> <li>• Room occupancy ratio</li> <li>• Bed occupancy ratios</li> </ul>
Transport		<ul style="list-style-type: none"> <li>• Passenger – kilometre</li> <li>• Operating cost - per passenger kilometre.</li> </ul>

#### 4. Application of ratio analysis in financial decision making:

Ratio analysis is relevant in assessing the performance of a firm in respect of following aspects:

##### 4.1 Financial ratios for evaluating performance:

###### **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.

###### **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.

### **Operating efficiency:**

- Ratio analysis throws light on the degree of efficiency in the management and utilization 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.

### **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 utilization of the assets of the firm.
- This is possible if an integrated view is taken and all the ratios are considered together.

### **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.

### **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.

## **5. Limitations of financial ratios**

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The limitations of financial ratios are listed below:

### **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.

### **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.

### **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).

### **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.

### **Differences in accounting policies and accounting period:**

It can make the accounting data of two firms non - comparable as also the accounting ratios.

### **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.

### **Difficulty to generalize 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.

### **Financial ratios are inter - related, not independent:**

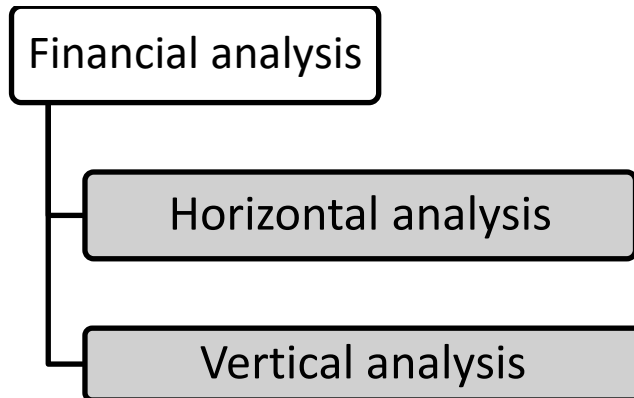
Viewed in isolation one ratio may highlight efficiency. But when considered as a set of ratios they may speak differently. Such interdependence among the ratios can be taken care of through multivariate analysis (analyzing the relationship between several variables simultaneously).

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.

## 6. Financial analysis

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Financial analysis can be of two types:



### **Horizontal Analysis:**

- When financial statement of one year are analysed and interpreted after comparing with another year or years, it is known as horizontal analysis.
- It can be based on the ratios derived from the financial information over the same time span.

### **Vertical Analysis:**

- When financial statement of single year is analyzed then it is called vertical analysis.
- This analysis is useful in inter firm comparison. Every item of Profit and loss account is expressed as a percentage of gross sales, while every item on a balance sheet is expressed as a percentage of total assets held by the firm.



**CHAPTER 3 – FINANCIAL ANALYSIS & PLANNING**  
**RATIO ANALYSIS - ILLUSTRATIONS**

**Illustration-1**

In a meeting held at Solan towards the end of 2016, the Directors of M/s 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 01.01.2017 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	2016 (Amt in Rs)		2017 (Amt in Rs)	
Cash Sales	30,000	3,00,000	32,000	
Credit	2,70,000		3,42,000	3,74,000
Sales <b>Less:</b> COGS		2,36,000		2,98,000
<b>Gross profit</b>		64,000		76,000
<i>Less: Op. Exp</i>				
Warehousing	13,000		14,000	
Transport	6,000		10,000	
Administrative	19,000		19,000	
Selling	11,000		14,000	
<i>Non-Op. Exp</i>	-	49,000	2,000	59,000
<b>Net Profit</b>		<b>15,000</b>		<b>17,000</b>

**Balance Sheet**

Assets & Liabilities	2016		2017	
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)	1,20,000		1,83,000	
Payables	50,000		76,000	
Total Current Liabilities (CL)				
	50,000		76,000	
Working Capital (CA - CL)		70,000		1,07,000
Total 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
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You are required to calculate the following ratios for the years 2016-2017.

- (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, and
- (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 2017. Ignore Taxation.

### Illustration 2

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 A/c	17,000	Plant and Machineries	50,000	
Current Liabilities	40,000	Less: Depreciation	15,000	35,000
				1,15,000
		Stock	21,000	
		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 a Balance Sheet as at 31st March 2017:

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

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

### Debentures were issued on 1st April, interest being paid annually on 31st March 2017.

- (ii) Land and Buildings remained unchanged. Additional plant and machinery have been bought and a further Rs 5,000 depreciation 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%.
- (viii) Gross profit was at the rate of 15% of selling price.
- (ix) Stock turnover was eight times for the year.

Ignore Taxation

### Illustration 3

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) net profit margin;
- (ii) return on assets;
- (iii) return on assets;
- (iv) asset turnover and
- (v) return on owner's equity

#### Illustration 3(a)

The total sales (all credit) of a firm are Rs 6,40,000

It has a gross profit margin of 15%

Current ratio of 2.5

The firm's current liabilities are Rs 96,000

Inventories Rs 48,000 and cash Rs 16000

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

#### Illustration 3(b)

The capital structure of Beta Limited is as follows

Particulars	Amount
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%), Rs 2,70,000

Depreciation Rs 60,000

Equity dividend paid 20%

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 share
- (d) Price-earnings ratio

#### Illustration 3(c)

The following accounting information and financial ratios of PQR Ltd. Relate to the year ended 31<sup>st</sup> Dec 2016

I	Accounting Information	
	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
II	Financial Ratios:	
	Fixed assets to sales	1:3
	Fixed assets to current assets	2:1
	Current ratio	2:1
	Long-term loans to Current liabilities	1:4
	Capital to Reserves and Surplus	

If value of fixed assets as on 31<sup>st</sup> December, 2015 amounted to Rs 26 lakhs, prepare a summarized Profit and Loss Account of the company for the year ended 31<sup>st</sup> December, 2016 and also the Balance sheet as on 31<sup>st</sup> December, 2016.

#### Illustration – 4

Ganpati Limited has furnished the following ratios and information relating to the year ended 31st March 2017.

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 :

- Calculate the operating expenses for the year ended 31st March 2017.
- Prepare a balance sheet as on 31st March in the following format:

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

#### Illustration - 5 (Balance Sheet completion)

Using the following information, complete this balance sheet:

Long-term debt to net worth	0.5:1
Total asset turnover	2.5 x
Average collection period*	18 Days
Stock turnover	9 x
Gross profit margin	10%
Acid Test Ratio	1 to 1

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

Assets	Amount (In Rs)	Liabilities	Amount (In Rs)
--------	----------------	-------------	----------------

Cash		Notes and payables	1,00,000
Accounts receivable		Long-term debt	
Stock		Common stock	1,00,000
Plant and equipment		Retained earnings	1,00,000
<b>Total Assets</b>		<b>Total liabilities and equity</b>	

### Illustration – 6 (Sona Ltd.)

- The assets of SONA Ltd consist of fixed assets and current assets, while its current liabilities comprise bank credit in the ratio of 2 : 1.
- You are required to prepare the Balance Sheet of the company as on 31st March 2017 with the help of following information:

Share Capital	5,75,000
Working Capital (CA-CL)	1,50,000
Gross Margin	25%
Inventory Turnover	5 times
Average Collection Period	1.5 Months
Current Ratio	1.5 : 1
Quick Ratio	0.8 : 1
R&S to Bank & Cash	4 times

### Illustration - 7 (Summarized Balance Sheet)

From the following information, prepare a summarized Balance Sheet as at 31st March 2017

Working Capital	Rs.2,40,000
Bank overdraft	Rs.40,000
Fixed Assets to Proprietary ratio	0.75
Reserves and Surplus	Rs.1,60,000
Current ratio	2.5
Liquid ratio	1.5

### Illustration – 8 (MNOP)

With the help of the following information complete the Balance Sheet of MNOP Ltd.:

Equity share capital	Rs. 1,00,000
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The relevant ratios of the company are as follows :

Current debt to total debt	0.4
Total debt to owner's equity	0.6
Fixed assets to owner's equity	0.6
Total assets turnover	2 Times
Inventory turnover	8 Times

### Illustration – 9(Balance Sheet completion)

Complete the Balance Sheet from the data given below:

Gross Profit	Rs. 54,000
Shareholders' Funds	Rs.6,00,000
Gross Profit Margin	20%
Credit Sales to Total Sales	80%
Total Assets Turnover	0.3 times
Inventory Turnover	4 times
Avg. Collection Periods (a 360 days year)	20 days
Current Ratio	1.8
Long-term Debt to Equity	40%

### Illustration 10 (Beta Ltd)

The following information relates to Beta Ltd. for the year ended 31st March 2017:

Net Working Capital	Rs. 12,00,000
Fixed Assets to Proprietor's Fund Ratio	0.75 times
Working Capital Turnover Ratio	5 times
Return on Equity (ROE)	15%

There is **no Debt Capital**.

You are required to calculate:

- (i) Proprietor's Fund
- (ii) Fixed Assets
- (iii) Net Profit Ratio.

### Illustration 11 (MN Ltd)

MN Limited gives you the following information for the year ending 31st March, 2017:

Current Ratio	2.5: 1
Debt-Equity Ratio	1:1.5
Return on Total Assets	15%
Total Assets Turnover Ratio	2
Gross Profit Ratio	20%
Stock Turnover Ratio	7
Current Market Price per Equity Share	Rs. 16
Net Working Capital	Rs. 4,50,000
Fixed Assets	Rs. 10,00,000
60,000 Equity Shares of Rs. 10 each	
20,000, 9% Preference Shares of Rs. 10 each	
Opening Stock	Rs. 3,80,000

You are required to calculate: (i) Quick Ratio  
(ii) Fixed Assets Turnover Ratio  
(iii) Proprietary Ratio

- (iv) Earnings Per Share
- (v) Price-Earning Ratio.

**Illustration 12 (M Ltd)**

The following accounting information and financial ratios of M Limited relate to the year ended 31<sup>st</sup> March, 2017:

Inventory Turnover Ratio	6 Times
Creditors Turnover Ratio	10 Times
Debtors Turnover Ratio	8 Times
Current Ratio	2.4
Gross Profit Ratio	25%

- Total sales Rs 30,00,000;
- cash sales 25% of credit sales;
- cash purchases Rs 2,30,000;
- working capital Rs 2,80,000;
- closing inventory is Rs 80,000 more than opening inventory

You are required to calculate:

- i. Average Inventory
- ii. Purchases
- iii. Average Debtors
- iv. Average Creditors
- v. Average Payment Period
- vi. Average Collection Period
- vii. Current Assets
- viii. Current Liabilities

**Illustration 13 [Q1 (c) May 2018 Q paper]**

The accountant of Moon Ltd. has reported the following data:

Gross profit	Rs. 60,000
Gross profit margin	20%
Total Assets turnover	0.3 :1
Net worth to total assets	0.9 :1
Current ratio	1.5 :1
Liquid assets to current liability	1:1
Credit sales to total sales	0.8:1
Average collection period (Assume 360 days a year)	60 days

You are required to complete the following  
Balance sheet of Moon Ltd.

Liabilities	Rs.	Assets	Rs.
Net worth		Fixed Assets	
Current liabilities		Stock	

		Debtors	
		Cash	
Total liabilities		Total Assets	

**Illustration 14 [Q1(C) Nov 2018 Question Paper ]**

The following is the information of XML Ltd. related to the year 31.3.2018:

Gross Profit of Sales	20% of sales
Net Profit	10% of sales
Inventory Holding Period	3 Months
Receivable Collection Period	3 Months
Non-Current Assets to Sales	1:4
Non-Current Assets to Current Assets	1:2
Current Ratio	2:1
Non-Current Liabilities to Current Liabilities	1:1
Share Capital to Reserves and Surplus	4:1
Non-Current Assets as on 31 <sup>st</sup> March, 2017	Rs 5000000

Assume that:

No change in current Assets during 2017-18.

No depreciation charged on Non-Current Assets during the year 2017-18.

Tax Ignored

You are required to calculate Cost of goods sold, Net Profit, Inventory, Receivables and cash for the year ended 31<sup>st</sup> March, 2018

**Illustration 15 [Q1 RTP Nov 20]**

Following information has been provided from the books of M/s Laxmi & Co. for the year ending on 31st March, 2020:

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, 2020

**Illustration 16 [Q1a May 2019 Question Paper]**

Following figures and ratios are related to a company Q Ltd. :

i. Sales for the year (all credit)	Rs. 30,00,000
ii. Gross Profit ratio	25 per cent
iii. Fixed assets turnover (based on cost of goods sold)	1.5
iv. Stock turnover (based on cost of goods sold)	6
v. Liquid ratio	1 : 1



vi. Current ratio	1.5 : 1
vii. Receivables (Debtors) collection period	2 months
viii. Reserves and surplus to share capital	0.6 : 1
ix. Capital gearing ratio	0.5
x. Fixed assets to net worth	1.2 : 1

You are required to calculate:

- i. Closing stock,
- ii. Fixed Assets,
- iii. Current Assets,
- iv. Debtors and Net worth.

### Illustration 17 (RTP, May 2018)

Following figures are available in the books Tirupati Ltd.

Fixed assets turnover ratio	8 times
Capital turnover ratio	2 times
Inventory Turnover	8 times
Receivable turnover	4 times
Payable turnover	6 times
G P Ratio	25%
Gross profit during the year	₹ 8,00,000
There is no long-term loan or overdraft.	
Reserve and surplus	₹ 2,00,000
Ending inventory of the year	₹ 20,000 above the beginning inventory

CALCULATE various assets and liabilities and PREPARE a Balance sheet of Tirupati Ltd

### Illustration 18 [Q1 Nov 2018 RTP]

Assuming the current ratio of a Company is 2

STATE in each of the following cases whether the ratio will improve or decline or will have no change:

	Current liability	Current assets	Current ratio
(i) Payment of current liability			
(ii) Purchase of fixed assets by cash			
(iii) Cash collected from Customers			
(iv) Bills receivable dishonoured			
(v) Issue of new shares			

### Illustration 19 [Q1a Nov 2019]

Following information has been gathered from the books of Tram Ltd. the equity shares of which is trading in the stock market at ₹ 14

Particulars	Amount (₹)
Equity Share Capital (face value ₹ 10)	10,00,000
10% Preference Shares	2,00,000
Reserves	8,00,000
10% Debentures	6,00,000
Profit before Interest and Tax for the year	4,00,000
Interest	60,000
Profit after Tax for the year	2,40,000

Calculate the following:

- (i) Return on Capital Employed
- (ii) Earnings per share
- (iii) PE ratio

**Illustration 20 [Q3(b) May 2019 - Part 1\*]**

Using the information given below, complete the Balance Sheet of PQR Private Limited:

(i)	Current ratio	1.6 :1
(ii)	Cash and Bank balance	15% of total current assets
(iii)	Debtors turnover ratio	12 times
(iv)	Stock turnover (cost of goods sold) ratio	16 times
(v)	Creditors turnover (cost of goods sold) ratio	10 times
(vi)	Gross Profit ratio	20%
(vii)	Capital Gearing ratio	0.6
(viii)	Depreciation rate	15% on W.D.V.
(ix)	Net Fixed Assets	20% of total assets

(Assume all purchase and sales are on credit)

**Balance Sheet of PQR Private Limited as at 31.03.2019**

Liabilities	(Rs.)	Assets	(Rs.)
Share Capital	25,00,000	<b>Fixed Assets</b>	
Reserve & surplus		Opening WDV	
12% Long term debt		Less: Depreciation	
<b>Current Liabilities</b>		<b>Current Assets</b>	
Creditors		Stock	
Provisions & outstanding expense	68,50,000	Debtors	
		Cash and bank balance	
<b>Total</b>	<b>?</b>	<b>Total</b>	<b>?</b>

### Illustration 21

G Ltd. has furnished the following information relating to the year ended 31<sup>st</sup> March, 2017 and 31<sup>st</sup> March, 2018:

	31 <sup>st</sup> March, 2017	31 <sup>st</sup> March, 2018
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 31<sup>st</sup> March, 2018 in following format:

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

### Illustration 22 [Q1 RTP Nov 21]

1. Following information has been gathered from the books of Cram Ltd. for the year ended 31<sup>st</sup> March 2021, the equity shares of which is trading in the stock market at ` 28:

Particulars	Amount ( ` )
Equity Share Capital (Face value @ ` 20)	20,00,000
10% Preference Share capital	4,00,000
Reserves & Surplus	16,00,000
12.5% Debentures	12,00,000
Profit before Interest and Tax for the year	8,00,000

CALCULATE the following when company falls within 25% tax bracket:

1. Return on Capital Employed
2. Earnings Per share
3. P/E Ratio

### Illustration 23

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

Fixed Assets	₹ 40,00,000
Closing Stock	₹ 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

### Illustration 24

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

	31st March 2020	31st March 2021
Share Capital	40,00,000	40,00,000
Reserves 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%
- The long-term loan has been used to finance 40% of the fixed assets.
- Stock turnover with respect to the 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	₹	Assets	₹
Share Capital		Fixed Assets	
Reserves and Surplus		Sundry Debtors	
Long Term Loan		Closing Stock	
Sundry Creditors		Cash in hand	

### Illustration 25

Following information relates to Temer Ltd.:

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

Closing stock of the period is ₹ 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

### Illustration 26

1. From the following information and ratios, PREPARE the Balance sheet as at 31<sup>st</sup> March, 2023 and Income Statement for the year ended on that date for M/s Ganguly & Co -

Average Stock	₹ 10 lakh
Current Ratio	3:1
Acid Test Ratio	1:1
PBIT to PBT	2.2:1
Average Collection period (Assume 360 days in a year)	30 days
Stock Turnover Ratio (Use sales as turnover)	5 times

Fixed assets turnover ratio	0.8 times
Working Capital	10 lakh
Net profit Ratio	10%
Gross profit Ratio	40%
Operating expenses (excluding interest)	9 lakh
Long term loan interest	12%
Tax	Nil

**Illustration 27**

1. From the following information, you are required to PREPARE a summarised Balance Sheet for Rudra Ltd. for the year ended 31st March, 2023:

Debt Equity Ratio	1:1
Current Ratio	3:1
Acid Test Ratio	5:3
Fixed Asset Turnover (on the basis of sales)	4
Stock Turnover (on the basis of sales)	6
Cash in hand	5,00,000
Stock to Debtor	1:1
Sales to Net Worth	4
Capital to Reserve	1:2

Gross Profit 20% of Cost

COGS to Creditor 10:1

Interest for entire year is yet to be paid on Long Term loan @ 10%.

### 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.

Hence, 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

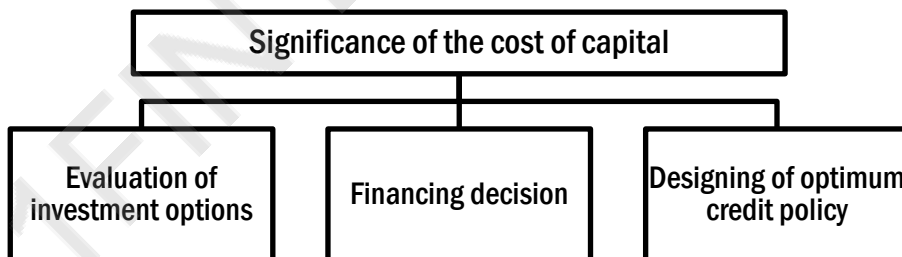
### 2. Meaning of cost of capital:

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 cash flow or stream of cash flows. 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. Significance of the cost of capital:

The cost of capital helps in the following decision making:



#### 3.1 Evaluation of investment options:

- The estimated benefits (future cash flows) from available investment opportunities (business or project) are converted into the present value of benefits by discounting them with the relevant cost of capital.

- Here it is pertinent to mention that every investment option may have different cost of capital hence it is very important to use the cost of capital which is relevant to the options available

### 3.2 Financing Decision:

- When a finance manager has to choose one of the two sources of finance, he can simply compare their cost and choose the source which has lower cost.
- Besides cost, he also considers financial risk and control.

### 3.3 Designing of optimum credit policy:

- While appraising the credit period to be allowed to the customers, the cost of allowing credit period is compared against the benefit / profit earned by providing credit to customer of segment of customers.
- Here cost of capital is used to arrive at the present value of cost and benefits received.

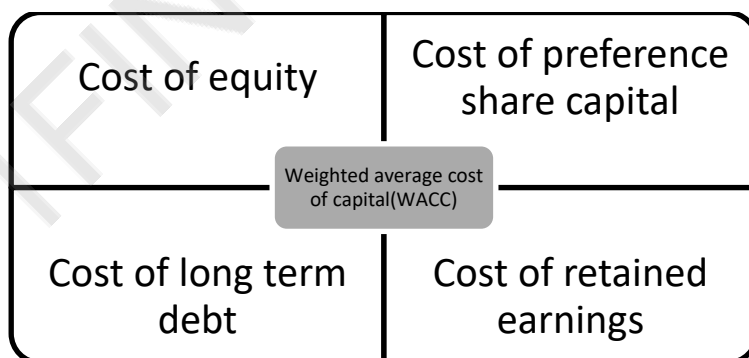
## 4. Determination of cost of capital:

Cost is not the amount which the company plans to pay or actually pays, rather than it is the expectation of stakeholders. Here, stakeholders include providers of capital (shareholders, debenture holder, money lenders etc.). Intermediaries (brokers, underwriters, merchant bankers etc.), and Government (for taxes).

To calculate cost first of all we should identify various cash flows like:

1. Inflow of amount received at the beginning.
2. Outflows of payment of interest, dividend, redemption amount etc.
3. Inflow of tax benefit on interest or Outflow of payment of dividend tax.
4. Thereafter we can use trial & error method to arrive at a rate where present value of outflows is equal to present value of inflows. That rate is basically IRR. In investment decisions, IRR indicates income because there we have initial outflow followed by series of inflows. In cost of capital chapter, this IRR represents cost, because here we have initial inflow followed by series of net outflows.

Alternatively, we can use shortcut formulas. Though these shortcut formulas are easy to use but they give approximate answer and not the exact answer. We will discuss the cost of capital of each source of finance separately.





## 5. Cost of long-term 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.

### 5.1 Features of debentures or bonds:

#### 1) Face value:

- Debentures or bonds are denominated with some value; this denominated value is called face value of the debenture.
- Interest is calculated on the face value of the debenture. E.g. if a company issues 9% non-convertible debentures of Rs 100 each, this means the face value is Rs 100 and the interest @9% will be calculated on this face value.

#### 2) Interest ( Coupon ) Rate :

- Each debenture bears a fixed interest (coupon) rate (except Zero coupon bond and Deep discount bond).
- Interest (coupon) rate is applied to face value of debenture to calculate interest, which is payable to the holders of debentures periodically (annually, semi - annually. etc.)

#### 3) Maturity period :

- Debentures or Bonds have a fixed maturity period for redemption.
- However, in case of irredeemable debentures maturity period is not defined and it is taken as infinite.

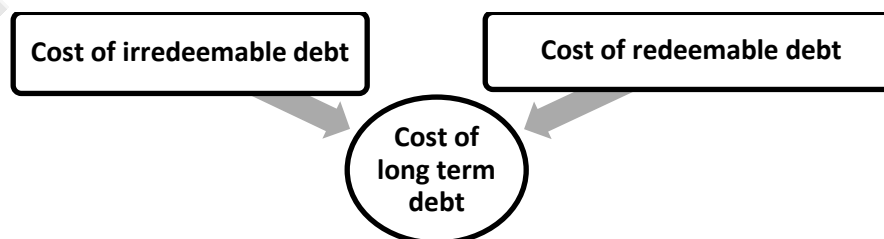
#### 4) Redemption Value:

- Redeemable debentures or bonds are redeemed on its specified maturity date.
- Based on the debt covenants, the redemption value is determined.
- Redemption value may vary from the face value of the debenture.

#### 5) Benefit of tax shield:

- The payment of interest to the debenture holders are allowed as expenses for the purpose of corporate tax determination.
- Hence, interest paid to the debenture holders save the tax liability of the company. Saving in the tax liability is also known as tax shield. The example given below will show you how interest paid by a company reduces the tax liability.

Based on redemption (repayment of principal) on maturity the debts can be categorized into two types (i) Irredeemable debts (ii) Redeemable debts



### 5.2 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:

Formula	Interpretation
$K_d = I(1-t) / NP$ <p>Where,</p> <p><math>K_d</math> = Cost of debt after tax</p> <p><math>I</math> = annual Interest payment</p> <p><math>NP</math> = Net proceeds of debentures or current market price</p> <p><math>t</math> = Tax rate</p>	<ul style="list-style-type: none"> <li>• Net proceeds means issue price less issue expenses or floatation cost (defined below).</li> <li>• If issue price is not given, then students can assume it to be equal to current market price.</li> <li>• If issue expenses are not given, then simply assume it to be equal to zero</li> </ul>

### **Floatation Cost:**

- The new issue of a security (debt or equity) involves some expenditure in the form of underwriting or brokerage fees, legal and administrative charges, registration fees, printing expenses etc.
- The sum of all these costs is known as floatation cost.
- This expenditure is incurred to make the securities available to the investors.
- Floatation cost is adjusted to arrive at net proceeds for the calculation of cost of capital.

### **5.3 cost of redeemable debentures (using approximation method):**

<p><b>Cost of redeemable debenture (<math>K_d</math>)</b> = <math display="block">\frac{I(1-t) + \left(\frac{RV-NP}{n}\right)}{\frac{RV+NP}{2}}</math></p> <p>Where,</p> <p><math>I</math> = Interest payment</p> <p><math>NP</math> = Net proceeds or current market price</p> <p><math>RV</math> = Redemption value of debenture</p> <p><math>t</math> = tax rate</p> <p><math>n</math> = Remaining life of debentures</p>
--

The above formula to calculate cost of debt is used where only interest on debt is tax deductible. Sometime, debts are issued at discount and / or redeemed at a premium. If discount on issue and / or premium on redemption are tax deductible, the following formula can be used to calculate the cost of debt.

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

Where,

I = Interest payment

NP = Net proceeds or current market price

RV = Redemption value of debenture

t = tax rate

n = Remaining life of debentures

Above formulas give approximate value of cost of debt. In these formulas, higher the difference between RV and NP, lower the accuracy of answer. Therefore, one should not use these formulas if difference between RV and NP is very high. Also, these formulas are not suitable in case of gradual redemption of bonds.

#### 5.4 Amortization of bond:

A bond may be amortized every year i.e., principal is repaid every year rather than at maturity. In such a situation, the principal will go down with annual payments and interest will be computed on the outstanding amount. The cash flows of the bonds will be uneven. The formula for determining the value of a bond or debenture that is amortized every year is as follows.

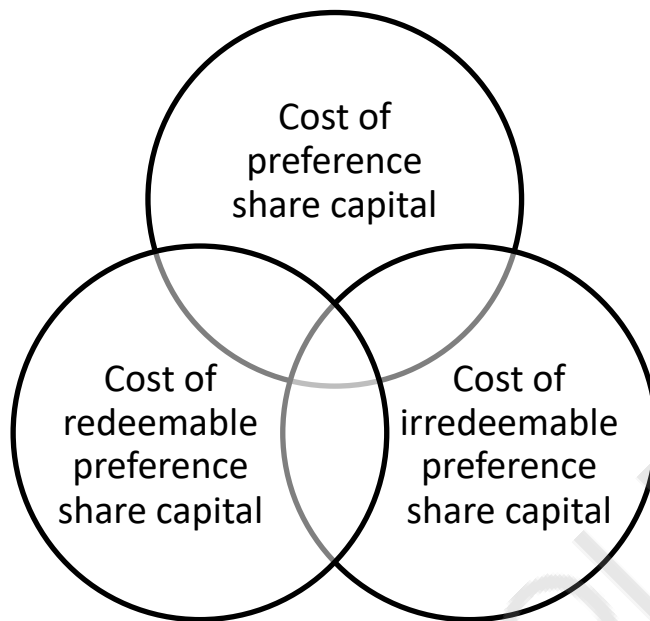
$$V_B = \frac{C_1}{(1+K_d)^1} + \frac{C_2}{(1+K_d)^2} + \dots + \frac{C_n}{(1+K_d)^n}$$

#### 5.5 Cost of convertible debentures:

- The holders of the convertible debentures have the option to either get the debentures redeemed into the cash or get specified numbers of company's shares in lieu of cash.
- The calculation of cost of convertible debentures is very much similar to that of redeemable debentures.
- While determining the redemption value of the debentures, it is assumed that all the debenture holders will choose the option which has the higher value and accordingly, it will be considered to calculate the cost of debentures.

#### 6. Cost of preference share capital:

Like debentures, preference share capital can also be categorized as redeemable and irredeemable.



### 6.1 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

$P_0$  = Net proceeds from issue of preference shares

Net proceeds means issue price less issue expenses or floatation cost. If issue price is not given, then students can assume it to be equal to current market price. If issue expenses are not given, then simply assume it to be equal to zero.

### 6.2 Cost of redeemable preference shares:

- Preference shares issued by a company which are redeemed on its maturity are 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:

$$\text{Cost of redeemable preference shares } (K_p) = \frac{PD + \left(\frac{RV - NP}{n}\right)}{\frac{RV + NP}{2}}$$

Where,

PD = annual preference dividend

RV = Redemption value of preference shares

NP = Net proceeds from issue of preference shares

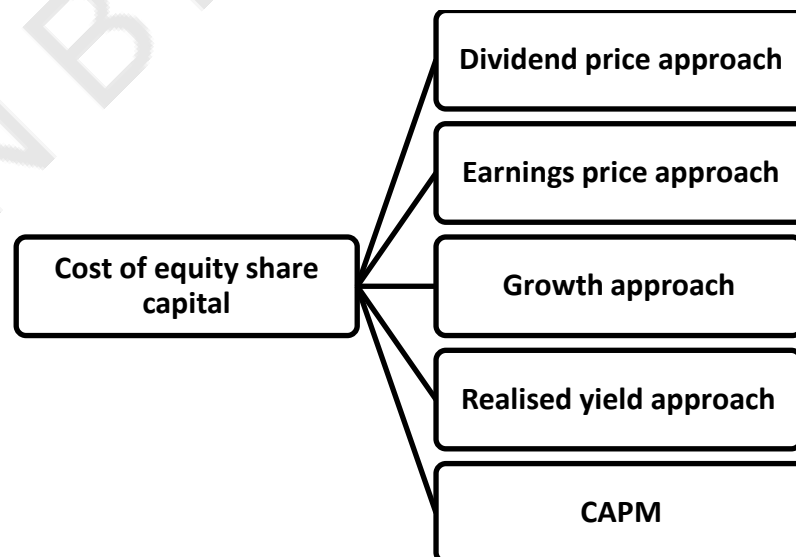
n = Remaining life of preference shares

- Net proceeds mean issue price less issue expenses or floatation cost.
- If issue price is not given, then students can assume it to be equal to current market price.
- If issue expenses are not given, then simply assume it to be equal to zero.
- The cost of redeemable preference shares can also be calculated as the discount rate that equates the net proceeds of the sale of preference shares with the present value of the future dividends and principal payments.

### 7. Cost of equity share capital( $K_e$ ):

There is not a single method to calculate cost of equity but different methods which depends on various factors like:

- If dividend is expected to be constant, then dividend price approach should be used.
- If earning per share is expected to be constant, then earning price approach should be used.
- If dividend and earning are expected to grow at a constant rate, then growth approach (Gordon's model) should be used.
- If it is difficult to forecast future, then realised yield approach should be used, which looks into past.
- All the above methods calculate the cost of equity as a balancing figure. When the cost of equity or expectation of investors is dependent on risk i.e., Higher the risk, higher the expectations and vice versa, then Capital asset pricing model (CAPM) should be used, which is based on risk.



#### 7.1 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:

$$\text{Cost of equity (Ke)} = \frac{D}{P_0}$$

Where,

$K_e$  = Cost of equity

$D$  = Expected dividend

$P_0$  = Market price of equity (ex-dividend)

### 7.2 Earnings price approach:

$$\text{Cost of equity (Ke)} = \frac{E}{P}$$

Where,

$E$  = current earnings per share

$P$  = market price per share

This approach assumes that the earnings per share will remain constant forever. The Earning Price Approach is similar to the dividend price approach; only it seeks to nullify the effect of changes in the dividend policy.

### 7.3 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:

$$\text{Cost of equity (Ke)} = \frac{D_1}{P_0} + g$$

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

In case of newly issued equity shares where floatation cost is incurred, the cost of equity share with an estimation of constant dividend growth is calculated as below:

$$\text{Cost of equity (Ke)} = \frac{D_1}{P_0 - F} + g$$

Where,

F = floatation cost per share

### **Estimation of growth rate:**

The calculation of 'g' (the growth rate) is an important factor in calculating cost of equity share capital. Generally two methods are used to determine the growth rate, as discussed below:

#### **(i) Average method:**

$$\text{Current dividend } (D_0) = D_n(1+g)^n$$

Or

$$\text{Growth} = \sqrt[n]{\frac{D_0}{D_n}} - 1$$

Where,

$D_0$  = current dividend

$D_n$  = dividend in n years ago

#### **(ii) Gordon's growth model:**

Unlike the Average method, Gordon's growth model attempts to derive a future growth rate. As per this model, increase in the level of investment will give rise to an increase in future dividends. This model takes Earnings retention rate (b) and rate of return on investments (r) into account to estimate the future growth rate.

$$\text{Growth } (g) = b \times r$$

Where,

b = earnings retention rate (proportion of earnings available to equity shareholders which is not distributed as dividend)

r = rate of return on fund invested.

### **7.4 Realized yield approach:**

- According to this approach, the average rate of return realized in the past few years is historically regarded as 'expected return' in the future.
- It computes cost of equity based on the past records of dividends actually realised by the equity shareholders.
- Though, this approach provides a single mechanism of calculating cost of equity, it has unrealistic assumptions like risks faced by the company remain same; the shareholders continue to expect the same rate of return; and the reinvestment opportunity cost (rate) of the shareholders is same as the realised yield. If the earnings do not remain stable, this method is not practical.

## 7.5 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:

### Unsystematic Risk:

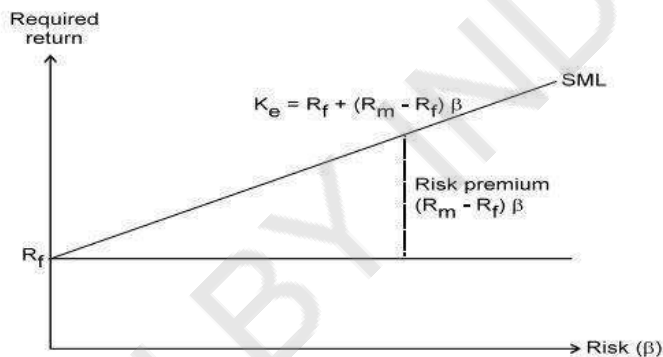
- This is also called company specific risk as the risk is related with the company's performance.
- This type of risk can be reduced or eliminated by diversification of the securities portfolio. This is also known as diversifiable risk.

### 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.

As diversifiable risk can be eliminated by an investor through diversification, the non - diversifiable risk is the risk which cannot be eliminated; therefore, a business should be concerned as per CAPM method, solely with non - diversifiable risk.

The non-diversifiable risks are assessed in terms of beta coefficient (b or beta) through fitting regression equation between return of a security and the return on a market portfolio.



### Cost of Equity under CAPM

Thus, the cost of equity capital can be calculated under this approach as:

$$\text{Cost of equity } (K_e) = R_f + \beta(R_m - R_f)$$

Where,

$K_e$  = cost of equity capital,

$R_f$  = risk free rate of return

B = beta coefficient

$R_m$  = Rate of return on market portfolio



$(R_m - R_f) = \text{Market risk premium}$



**Risk Return relationship of various securities**

Therefore, required rate of return = Risk free rate + Risk premium

- The idea behind CAPM is that the investors need to be compensated in two ways
  - (i) Time value of money and
  - (ii) Risk.
- The time value of money is represented by the risk - free rate in the formula and compensates the investors for placing money in any investment over a period of time.
- The other half of the formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk. This is calculated by taking a risk measure (beta) which compares the returns of the asset to the market over a period of time and compares it with the market premium.
- The CAPM says that the expected return of a security or a portfolio equals the rate on a risk - free security plus risk premium.
- If this expected return does not meet or beat the required return, then the investment should not be undertaken.

**The shortcomings of this approach are:**

- (a) Estimation of beta with historical data is unrealistic; and
- (b) Market imperfections may lead investors to unsystematic risk.

Despite these shortcomings, the CAPM is useful in calculating cost of equity, even when the firm is suffering losses.

## 8. Cost of retained earnings (Kr):

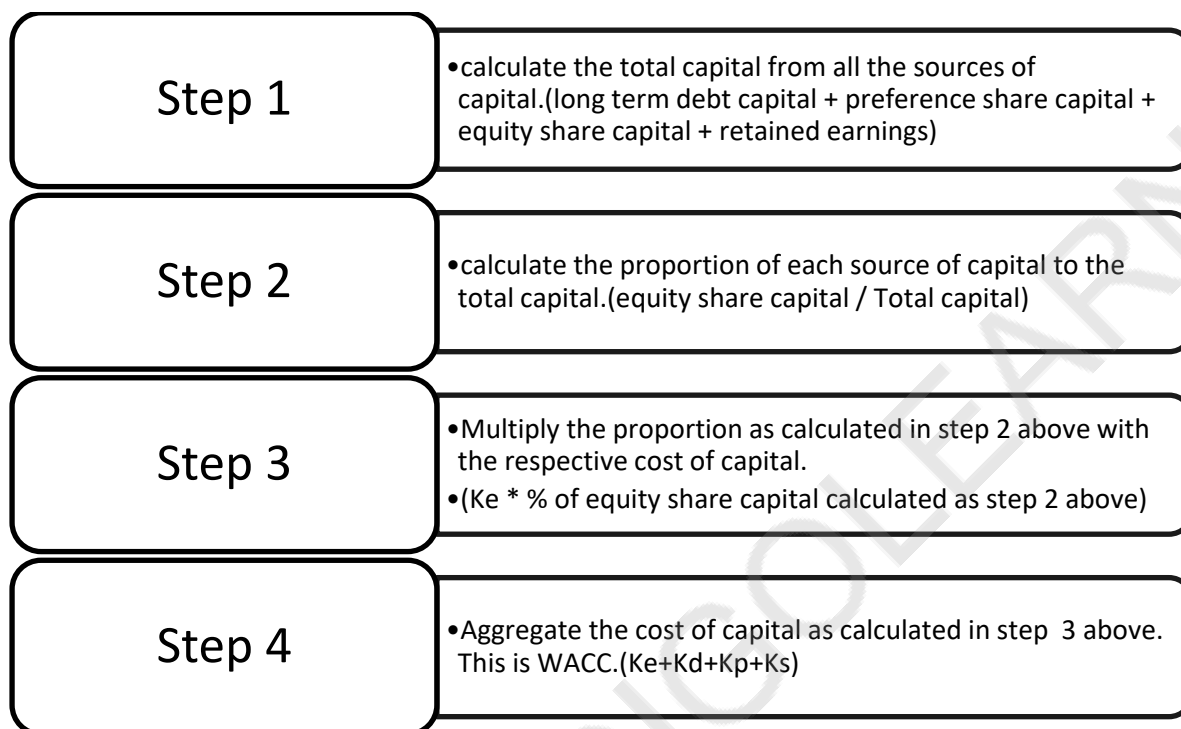
- Like other sources of fund, retained earnings also involves cost. It is the opportunity cost of dividends foregone by shareholders.
- The given below figure depicts how a company can either keep or reinvest cash or return it to the shareholders as dividends. (Arrows represent possible cash flows or transfers.)
- If the cash is reinvested, the opportunity cost is the expected rate of return that shareholders could have obtained by investing in financial assets.
- The cost of retained earnings is often used interchangeably with the cost of equity, as cost of retained earnings is nothing but the expected return of the shareholders from the investment in shares of the company.
- However, normally cost of equity remains higher than the cost of retained earnings, due to issue of shares at a price lower than current market price and floatation cost.

Formulas for retained earnings under following methods	Explanation
Dividend Price method: $K_r = D / P$	For the calculation of <ul style="list-style-type: none"> <li>• <math>K_e : P = \text{net proceeds realized} = \text{issue price less floatation cost.}</math></li> <li>• But for calculation of <math>K_r</math>, <math>P = \text{current market price.}</math></li> <li>• However, sometimes issue price may also be used.</li> <li>• The concept of Floatation cost is not used for the calculation of cost of retained earnings</li> </ul>
Earning price method $K_r = \text{EPS} / P$	
Growth method $K_r = (D_1/P_0)+g$	

## 10. Weighted average cost of capital (WACC):

- WACC of a company depends on the capital structure of a company.
- It weighs the cost of capital of a particular source of capital with its proportion to the total capital.
- Thus, weighted average cost of capital is the weighted average after - tax costs of the individual components of firm's capital structure.
- That is, the after - tax cost of each debt and equity is calculated separately and added together to a single overall cost of capital.

**The steps to calculate WACC is as follows:**



**Choice of weights:**

There is a choice weight between the book value (BV) and market value (MV). **Book Value (BV):**

- Book value weights are operationally easy and convenient.
- While using BV, reserves such as share premium and retained profits are included in the BV of equity, in addition to the nominal value of share capital.
- Here, the value of equity will generally not reflect historic asset values, as well as the future prospects of an organisation.

**Market Value (MV):**

- Market value weight is more correct and represents a firm's capital structure.
- It is preferable to use MV weights for the equity.
- While using MV, reserves such as share premium and retained profits are ignored as they are in effect incorporated into the value of equity.
- It represents existing conditions and also takes into consideration the impacts of changing market conditions and the current prices of various securities.
- Similarly, in case of debt, MV is better to be used rather than the BV of the debt, though the difference may not be very significant.
- There is no separate market value for retained earnings. Market value of equity shares represents both paid up equity capital and retained earnings.
- But cost of equity is not same as cost of retained earnings. Hence to give market value weights, market value of equity shares should be apportioned in the ratio of book value of paid up equity capital and book value of retained earnings.

### **11. Marginal cost of capital:**

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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 up to certain level of funds raised and then start increasing with amount of funds raised.

## CHAPTER 4 – COST OF CAPITAL ILLUSTRATIONS

### Illustration-1 (Cost of debentures)

Five years ago, Sona Limited issued 12 percent irredeemable debentures at Rs.103, a 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 percent, what is its current cost of debenture capital?

### Illustration-2 (Cost of debentures)

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% tax rate.

### Illustration-3 (Cost of debentures)

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

### Illustration-4 (Cost of debentures)

A company issued 10,000, 10% debentures of Rs 100 each on 1/4/2013 to be matured on 1/4/2018. The company wants to know the current cost of its existing debt and the market price of the debentures is Rs 80. Compute the cost of existing debentures assuming 35% tax rate.

### Illustration-5 (Value of a Bond)

RBML is proposing to sell a 5-year bond of Rs 5,000 at 8 % rate of interest per annum. The bond amount will be amortized equally over its life. What is the bond's present value for an investor if he expects a minimum rate of return of 6 per cent?

### Illustration-6 (Cost of debentures)

A Company issued 10,000 15% Convertible debentures of Rs 100 each with a maturity period of 5 years. At maturity the debenture holders will have the option to convert the debentures into equity shares of the company in the ratio of 1:10 (10 shares for each debenture). The current market price of the equity shares is Rs 12 each and historically the growth rate of the shares is 5% per annum. Compute the cost of debentures assuming 35% tax rate.

### Illustration-7 (Cost of debentures)

A Company issued 10,00,000 12% Debentures of Rs 100 each. The debentures are redeemable after expiry of fixed period of 7 years. The Company is in 35% tax bracket. Required:

- i. Calculate cost of debt after tax if debentures are issued at
  - a. Par;
  - b. 10% discount and
  - c. 10% premium
- ii. If brokerage is paid at 2%, what will be the cost of debentures if issue is at par.

### **Illustration-8 (Cost of preference shares)**

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?

### **Illustration-9 (Cost of preference shares)**

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

### **Illustration-10 (Cost of preference shares)**

If R Energy is issuing preferred stock at Rs100 per share, with a stated dividend of Rs 12, and a floatation cost of 3% then, what is the cost of preference share?

### **Illustration-11 (Cost of preference shares)**

A Company issued 40,000 12% Redeemable Preference Shares of Rs 100 each at a premium of Rs 5 each redeemable after 10 years at a premium of Rs 10 each. The floatation cost of each share is Rs 2. You are required to calculate cost of Preference Share Capital ignoring dividend tax.

### **Illustration-12 (Cost of preference shares)**

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% next year. Calculate the cost of equity if the market price of share is Rs.55.

### **Illustration-13 (Estimation of growth rate-Avg method)**

The current dividend ( $D_0$ ) is Rs.16.10 and the dividend 5 years ago was rs.10. What is the growth rate?

### **Illustration-14 (Cost of equity)**

Mr. Mehra had purchased a share of Alpha Limited for Rs. 1,000. He received dividend for a period of 5 years at the rate of 10 %. 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.

### **Illustration-15 (Cost of capital)**

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%.

### **Illustration-16 (Cost of retained Earnings)**

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 based on Dividend-Growth model?

### Illustration-17 (Cost of retained Earnings)

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.

### Illustration-18 (Cost of retained Earnings)

Y Ltd retains Rs. 7,50,000 out of its retained earnings. The expected rate of return to the shareholders, if they had invested the funds elsewhere is 10%. The brokerage is 3% and the shareholders come in 30% tax bracket. Calculate the cost of Retained Earnings

### Illustration-19 (Weighted average cost of capital)

Gama Limited has an issue of Rs 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, what is the weighted average cost of capital?

### Illustration-20 (Weighted average cost of capital)

The capital structure of a company consists of

- Equity shares of Rs. 50 lakhs;
- 10% Preference shares of Rs. 10 lakhs and
- 12% Debentures of Rs. 30 lakhs.

The cost of equity capital for the company is 14.7 percent and income-tax rate for this company is 30%.

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

### Illustration-21 (Weighted average cost of capital)

JKL Ltd. Has the following book-value capital structure as on March 31, 2017.

	<b>Rs.</b>
Equity share capital (2,00,000 shares)	40,00,000
11.5% Preference shares	10,00,000
10% Debentures	<u>30,00,000</u>
	<b>80,00,000</b>

The equity share of the company sells for Rs. 20. It is expected that the company will pay next year a dividend of Rs. 2 per equity share, which is expected to grow at 5% p.a. forever. Assume a 35% corporate tax rate.

Required:

- Compute weighted average cost of capital (WACC) of the company based on the existing capital structure.

- ii. Compute the new WACC, if the company raises an additional Rs. 20 lakhs debt by issuing 12% Debentures. This would result in increasing the expected equity dividend to Rs. 2.40 and leave the growth rate unchanged, but the price of equity share will fall to Rs. 16 per share

### Illustration-22 (Overall cost of capital)

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:

- 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.
- 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.
- Preference shares: 15% Preference shares with face value of Rs.100 would realise Rs.105 per share.
- 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%.
- Tax: Corporate tax rate is 35%. Ignore dividend tax.

### Illustration-23 (Overall cost of capital)

The following details are provided by the GPS Limited:

<b>Equity Share Capital</b>	65,00,000
<b>12% Preference Share Capital</b>	12,00,000
<b>15% Redeemable Debentures</b>	20,00,000
<b>10% Convertible Debentures</b>	8,00,000

The cost of equity capital for the company is 16.30% and Inc tax rate for the company is 30%. You are required to calculate the Weighted Average Cost of Capital (WACC) of the company.



### Illustration-24 (Marginal cost of capital)

XYZ Ltd. has the following book value capital structure:

(Rs. In Crores)

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

- 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%.

Required:

- Calculate the WACC using:**
  - Book value proportions; and
  - Market value proportions.
- Define the Marginal WACC 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.

### Illustration-25 (Marginal Cost of Capital)

ABC Ltd. has the following capital structure which is considered to be optimum as on 31st March 2017

	<b>Rs</b>
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 2017 EPS.

The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS (Rs)	Year	EPS (Rs)
2008	1.00	2013	1.61
2009	1.10	2014	1.77
2010	1.21	2015	1.95
2011	1.33	2016	2.15
2012	1.46	2017	2.36

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

Preference share 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. New equity share (consuming new equity from retained earnings)
- b. Calculate marginal cost of capital when no new shares are issued.
- c. How much can be spent for capital investment before new ordinary shares must be sold? Assuming that retained earnings for next year's investment are 50% of 2017.
- d. What will the marginal cost of capital when the funds exceed the amount calculated in (c), assuming new equity is issued at Rs 20 per share?

### Illustration-26 (Ko-Market Values)

ABC Limited has the following book value capital structure:

Rs in Million

Equity Share Capital (150 million shares, Rs.10 par)	1,500
Reserves and Surplus	2,250
10.5% Preference Share Capital (1 million shares, Rs.100 par)	100
9.5% Debentures (1.5 million debentures, Rs. 1,000 par)	1,500
8.5% Term Loans from Financial Institutions	500

- The debentures of ABC Limited are redeemable after three years and are quoting at Rs. 981.05 per debenture.

- The applicable income tax rate for the company is 35%.
- The current market price per equity share is Rs.60.
- The prevailing default risk free interest rate on 10-year GOI Treasury Bonds is 5.5%.
- The average market risk premium is 8%.
- The beta of the company is 1.1875.

The preferred stock of the company is redeemable after 5 years is currently selling at Rs. 98.15 per preference share.

Required:

- Calculate weighted average cost of capital of the company using market value weights.
- Define the marginal cost of capital schedule for the firm if it raises Rs.750 million for a new project.
  - The firm plans to have a target debt to value ratio of 20%.
  - The beta of new project is 1.4375.
  - The debt capital will be raised through term loans.
  - It will carry interest rate of 9.5% for the first 100 million and 10% for the next Rs. 50 million

### Illustration 27 (Additional Finance)

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:

<b>(1)</b>	Debt / Equity mix	30%/70%
<b>(2)</b>	Cost of Debt	
	up to Rs 1,80,000	10% (before tax)
	beyond Rs 1,80,000	16% (before tax)
<b>(3)</b>	Earnings per share	Rs 4
<b>(4)</b>	Dividend pay out	50% of earnings
<b>(5)</b>	Expected growth rate in dividend	10%
<b>(6)</b>	Current market price per share	Rs 44
<b>(7)</b>	Tax rate	50%

You are required:

- To determine the pattern for raising the additional finance.
- To determine the post-tax average cost of additional debt.
- To determine the cost of retained earnings and cost of equity, and
- Compute the overall weighted average after tax cost of additional finance.

### Illustration 28 (Q2 RTP NOV 2020)

Calculate the WACC using the following data by using:

1FIN by IndigoLearn

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

The capital structure of the company is as under:

Particulars	(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:

- Debenture - Rs. 105 per debenture
- Preference shares - Rs. 110 per preference share
- Equity shares Rs. 24 each.

Additional information:

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

### Illustration 29 (Q1(b) MAY 2019)

Alpha Ltd. has furnished the following information:

Earnings Per Share (EPS)	Rs. 4
Dividend pay-out ratio	25%
Market price per share	Rs. 50
Rate of tax	30%
Growth rate of dividend	10%

The company wants to raise additional capital of Rs. 10 lakhs including debt of Rs. 4 lakhs. The cost of debt (before tax) is 10% up to Rs. 2 lakhs and 15% beyond that. Compute the after-tax cost of equity and debt and weighted average cost of capital.

### Illustration 30 (Q4 Nov 2019)

A Company wants to raise additional finance of Rs.5 crore in the next year.

The company expects to retain Rs. 1 crore earning next year.

Further details are as follows:

- The amount will be raised by equity and debt in the ratio of 3: 1.
- The additional issue of equity shares will result in price per share being fixed at Rs. 25.

- iii. The debt capital raised by way of term loan will cost 10% for the first Rs. 75 lakh and 12% for the next Rs. 50 lakhs to 1.25 Crores
- iv. The net expected dividend on equity shares is Rs. 2.00 per share.
- v. The dividend is expected to grow at the rate of 5%.
- vi. Income tax rate is 25%.

You are required:

- a. To determine the amount of equity and debt for raising additional finance.
- b. To determine the post-tax average cost of additional debt.
- c. To determine the cost of retained earnings and cost of equity.
- d. To compute the overall weighted average cost of additional finance after tax.

### Illustration 31 (Q2 May 2018 RTP)

1. Navya Limited wishes to raise additional capital of ` 10 lakhs for meeting its modernisation plan. It has 3,00,000 in the form of retained earnings available for investments purposes. The following are the further details:

Debt/ equity mix	40%/60%
Cost of debt (before tax)	
Up to ` 1,80,000	10%
Beyond ` 1,80,000	16%
Earnings per share	4
Dividend pay out	2
Expected growth rate in dividend	10%
Current market price per share	44
Tax rate	50%

**Required**

1. To DETERMINE the pattern for raising the additional finance.
2. To CALCULATE the post-tax average cost of additional debt.
3. To CALCULATE the cost of retained earnings and cost of equity, and
4. To DETERMINE the overall weighted average cost of capital (after tax).

### Illustration 32 (RTP Q2 NOV 2018)

M/s. Navya Corporation has a capital structure of 40% debt and 60% equity.

The company is presently considering several alternative investment proposals costing less than ₹ 20 lakhs.

The corporation always raises the required funds without disturbing its present debt equity ratio

The cost of raising the debt and equity are as under:

	Project cost	Cost of debt	18015 Cost of	Cost of equity
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			debt (after tax)	
	Upto ₹ 2 lakhs	10%	5%	12%
	Above ₹ 2 lakhs & upto to ₹ 5 lakhs	11%	5.5%	13%
	Above ₹ 5 lakhs & upto ₹ 10 lakhs	12%	6%	14%
	Above ₹ 10 lakhs & upto ₹ 20 lakhs	13%	6.5%	14.5%

Assuming the tax rate at 50%, CALCULATE:

- (i) Cost of capital of two projects X and Y whose fund requirements are ₹ 6.5 lakhs and ₹ 14 lakhs, respectively.
- (ii) If a project is expected to give after tax return of 10%, DETERMINE under what conditions it would be acceptable.

#### Illustration 33 (Q2 RTP Nov 21)

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

#### Illustration 34

A company issues:

- 15% convertible debentures of ₹ 100 each at par with a maturity period of 6 years. On maturity, each debenture will be converted into 2 equity shares of the company. The risk-free rate of return is 10%, market risk premium is 18% and beta of the company is 1.25. The company has paid dividend of ₹ 12.76 per share. Five years ago, it paid dividend of ₹ 10 per share. Flotation cost is 5% of issue amount.
- 5% preference shares of ₹ 100 each at premium of 10%. These shares are redeemable after 10 years at par. Flotation cost is 6% of issue amount.  
Assuming corporate tax rate is 40%.

- (i) CALCULATE the cost of convertible debentures using the approximation method.

(ii) Use YTM method to CALCULATE cost of preference shares.

Year	1	2	3	4	5	6	7	8	9	10
PVIF 0.03, t	0.971	0.943	0.915	0.888	0.863	0.837	0.813	0.789	0.766	0.744
PVIF 0.05, t	0.952	0.907	0.864	0.823	0.784	0.746	0.711	0.677	0.645	0.614
PVIFA 0.03, t	0.971	1.913	2.829	3.717	4.580	5.417	6.230	7.020	7.786	8.530
PVIFA 0.05, t	0.952	1.859	2.723	3.546	4.329	5.076	5.786	6.463	7.108	7.722

Interest rate	1%	2%	3%	4%	5%	6%	7%	8%	9%
FVIF i, 5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539
FVIF i, 6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677
FVIF i, 7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828

### 1. Meaning of capital structure

Capital structure is the combination of capitals from different sources of finance. The capital of a company consists of equity shareholders fund, preference share capital and long term external debts.

The source and quantum of capital is decided keeping in mind the following factors:

- **Control:** Capital structure should be designed in such a manner that existing shareholders continue to hold majority stake.
- **Risk:** Capital structure should be designed in such a manner that financial risk of a company does not increase beyond tolerable limit.
- **Cost:** Overall cost of capital remains minimum.

The objective of a company is to maximize the value of the company and it is prime objective while deciding the optimal capital structure. Capital Structure decision refers to deciding the forms of financing (which sources to be tapped); their actual requirements (amount to be funded) and their relative proportions (mix) in total capitalization.

Calculation of value of firm:

Value of firm = EBIT / (Overall cost of capital / WACC)

$K_o = (\text{cost of debt} \times \text{weight of debt}) + (\text{cost of equity} \times \text{weight of equity})$

$$K_o = K_d \times \frac{D}{(D+S)} + K_e \times \frac{S}{(D+S)}$$

Where,

$K_o$  = WACC

$K_d$  = cost of debt

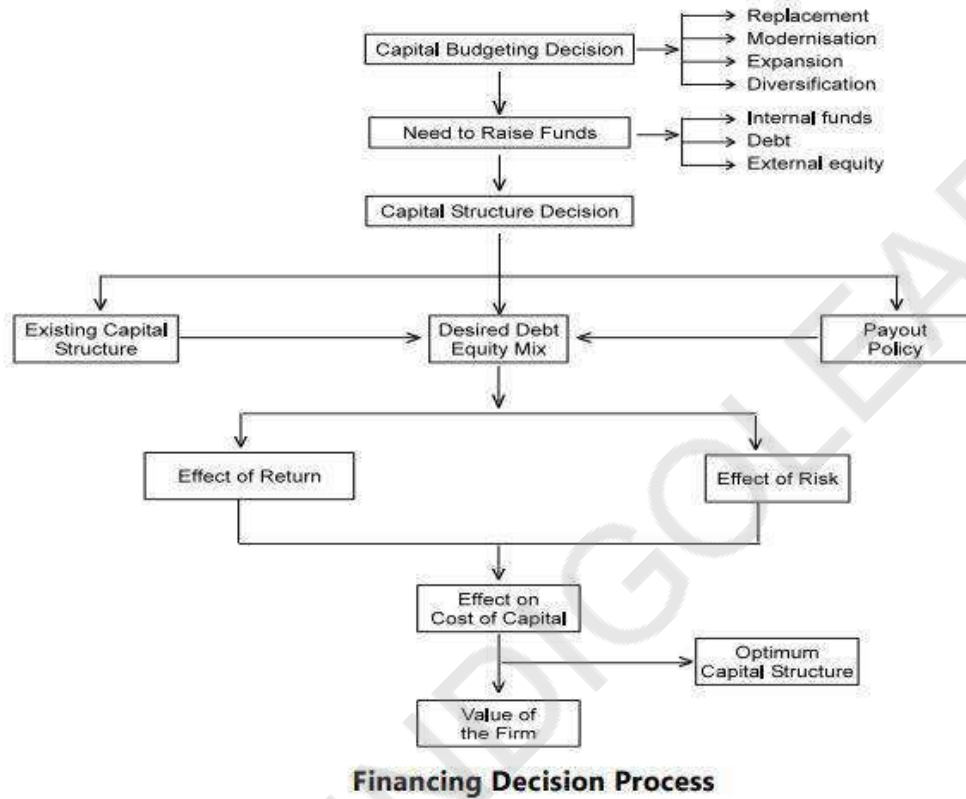
D = market value of debt

S = market value of equity

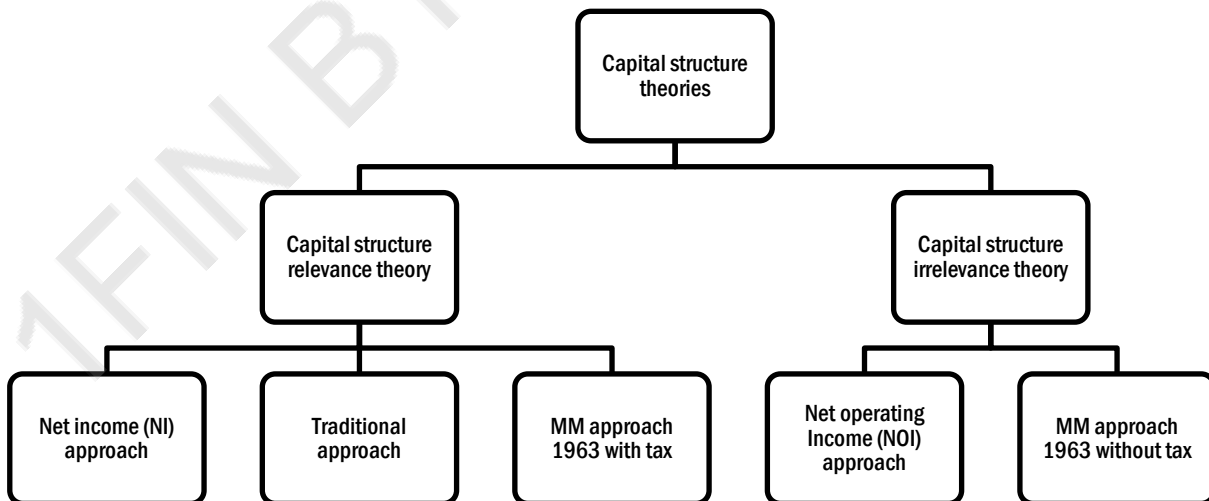
$K_e$  = cost of equity



The process of financing or capital structure decision is depicted in the following figure.



## 2. Capital structure theories:



Following approaches explain the relationship between cost of capital, capital structure and value of the firm:

- a. Net income (NI) Approach
- b. Traditional Approach
- c. Net operating income (NOI) approach
- d. Modigliani-Miller (MM) approach

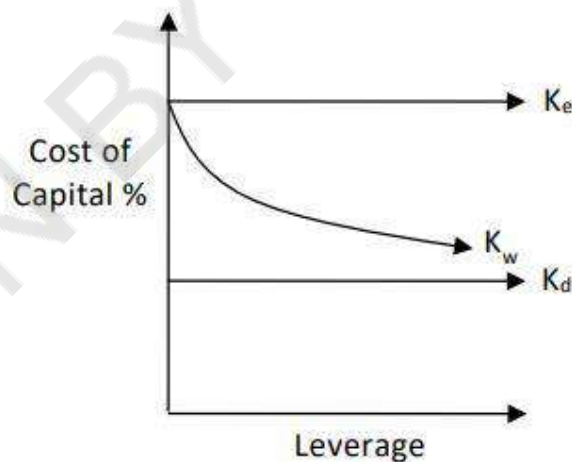
**The following assumptions should be made under this relationship:**

- There are only two kinds of funds used by a firm i.e. debt and equity.
- The total assets of the firm are given. The degree of leverage can be changed by selling debt to purchase shares or selling shares to retire debt.
- Taxes are not considered.
- The dividend payout ratio is 100 %.
- The firm's total financing remains constant.
- Business risk is constant over time.
- The firm has perpetual life.

### 2.1 Net income (NI) approach:

According to this approach,

- Capital structure decision is relevant to the value of the firm.
- An increase in financial leverage will lead to decline in the weighted average cost of capital (WACC), while the value of the firm as well as market price of ordinary share will increase.
- Conversely, a decrease in the leverage will cause an increase in the overall cost of capital and a consequent decline in the value as well as market price of equity shares.



Where,

$K_e$  = cost of equity

$K_w = \text{WACC}$

$K_d = \text{Cost of debt}$

Here,  $K_e$  and  $K_d$  are assumed not to change with leverage. As debt increases, it causes WACC to decrease.

Value of the firm based on Net Income approach

Value of firm ( $V$ ) =  $S + D$

Where,

$V =$  value of the firm

$S =$  Market value of equity = Earnings available for equity share holders(NI) / Equity capitalization rate ( $K_e$ )

$D =$  market value of debt

Under NI approach, the value of the firm will be maximum at a point where weighted average cost of capital (WACC) is minimum. Thus, the theory suggests total or maximum possible debt financing for minimizing the cost of capital. The overall cost of capital under this approach is:

Overall cost of capital =  $\text{EBIT} / \text{Value of firm}$

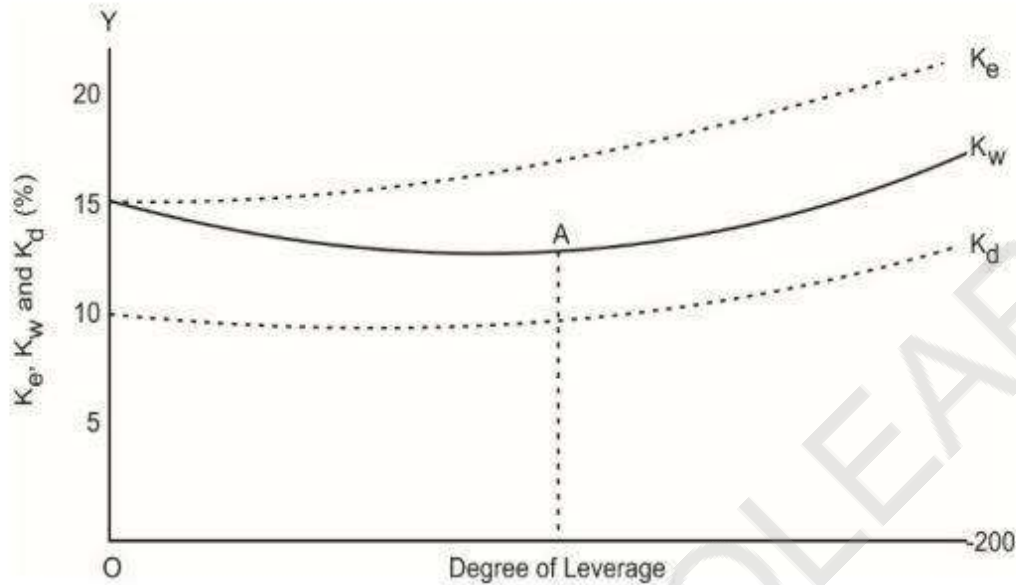
Thus, according to this approach, the firm can increase its total value by decreasing its overall cost of capital through increasing the degree of leverage. The significant conclusion of this approach is that it pleads for the firm to employ as much debt as possible to maximize its value.

## 2.2 Traditional Approach:

This approach favors that as a result of financial leverage up to some point, cost of capital comes down and value of firm increases. However, beyond that point, reverse trends emerges. The principle implication of this approach is that the cost of capital is dependent on the capital structure and there is an optimal capital structure which minimizes cost of capital.

Under this approach:

- The rate of interest on debt remains constant for a certain period and thereafter with an increase in leverage, it increases.
- The expected rate by equity shareholders remains constant or increase gradually. After that, the equity shareholders start perceiving a financial risk and then from the optimal point, the expected rate increases speedily.
- As a result of the activity of rate of interest and expected rate of return, the WACC first decreases and then increases.
- The lowest point on the curve is optimal capital structure.



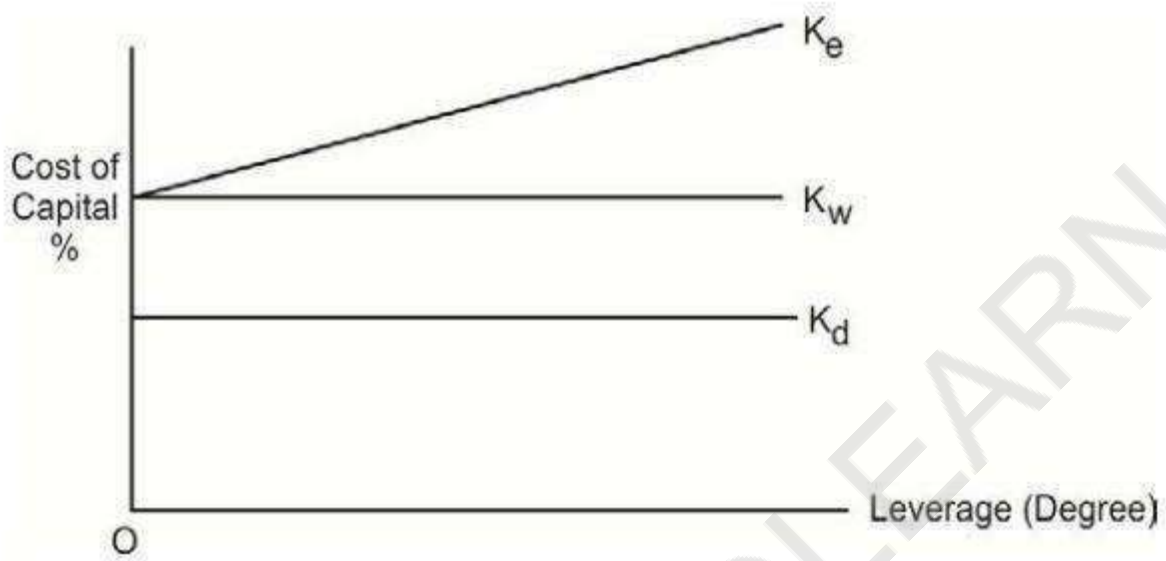
- Optimum capital structure occurs at the point where value of the firm is highest and the cost of capital is the lowest.
- According to net operating income approach, capital structure decisions are totally irrelevant. Modigliani - Miller supports the net operating income approach but provides behavioral justification.
- The traditional approach strikes a balance between these extremes.

### **Main Highlight of Traditional Approach:**

The firm should strive to reach the optimal capital structure and its total valuation through a judicious use of both the debt and equity in capital structure. At the optimal capital structure, the overall cost of capital will be minimum and the value of the firm will be maximum.

### **2.3 Net operating Income (NOI) Approach:**

- NOI means Earnings before interest and tax (EBIT). According to this approach, capital structure decisions of the firm are irrelevant.
- Any change in the leverage will not lead to any change in the total value of the firm and the market price of shares, as the overall cost of capital is independent of the degree of leverage.
- As a result, the division between debt and equity is irrelevant. As per this approach, an increase in the use of debt which is apparently cheaper is offset by an increase in the equity capitalization rate.
- This happens because equity investors seek higher compensation as they are opposed to greater risk due to the existence of fixed return securities in the capital structure.



Where,

$K_w$  = WACC

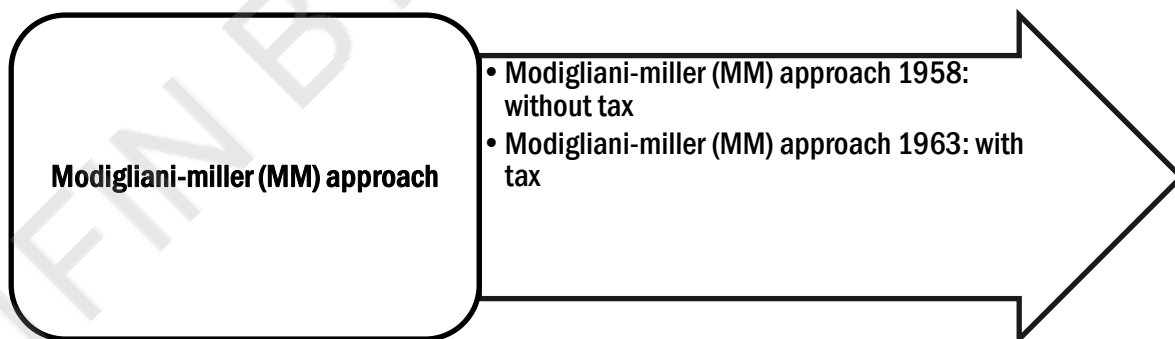
$K_d$  = Debt capitalization rate

$K_w$  and  $K_d$  are constant.

$K_e$  (cost of equity) increases with the leverage.

#### 2.4 Modigliani-miller (MM) Approach:

Modigliani-miller (MM) approach provides behavioral justification for constant overall cost of capital and therefore, total value of the firm.



**MM Approach - 1958 : without tax :**

This approach describes, in a perfect capital market where there is no transaction cost and no taxes, the value and cost of capital of a company remain unchanged irrespective of change in the capital structure.

This approach is based on further following additional assumptions:

- Capital markets are perfect.
- All information is freely available and there are no transaction costs.
- All investors are rational.
- Firms can be grouped into ' Equivalent risk classes ' on the basis of their business risk.
- Non-existence of corporate taxes.

Based on the above assumptions, Modigliani - Miller approach derived the following three propositions:

1. Total market value of a firm is equal to its expected net operating income divided by the discount rate appropriate to its risk class decided by the market.

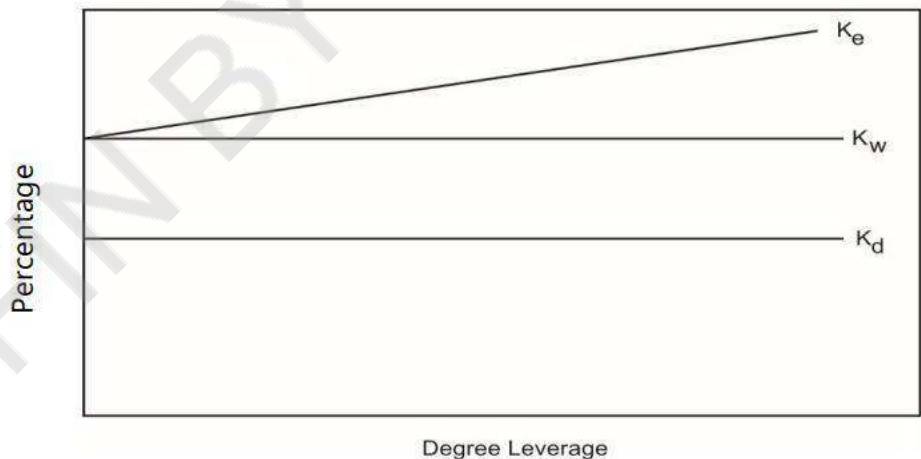
**Value of levered firm(Vg) = value of unlevered firm(Vu)**

$\text{Value of a firm} = \text{Net operating income(NOI)} / K_o$
---

2. A firm having debt in its capital structure has higher cost of equity than an unlevered firm. The cost of equity will include risk premium for the financial risk. The cost of equity in a levered firm is determined as under:

$K_e = K_o + (K_o - K_d) * (\text{Debt} / \text{equity})$
---

3. The structure of the capital (financial leverage) does not affect the overall cost of capital. The cost of capital is only affected by the business risk.



It is evident from the above diagram that the average cost of the capital ( $K_w$ ) is constant and is not affected by leverage.

- The value of the levered firm can neither be greater nor lower than that of an unlevered firm according to this approach.

- The two must be equal. There is neither advantage nor disadvantage in using debt in the firm's capital structure.
- This approach considers capital structure of a firm as a whole pie divided into equity, debt and other securities. No matter how the capital structure of a firm is divided (among debt, equity etc.), there is a conservation of investment value.
- Since the total investment value of a corporation depends upon its underlying profitability and risk, it is invariant with respect to relative changes in the firm's financial capitalization.

According to MM hypothesis, since the sum of the parts must be equal to the whole, therefore, regardless of the financing mix, the total value of the firm stays the same.

**The shortcoming of this approach** is that the suggested arbitrage process will fail to work because of imperfections in capital market, existence of transaction cost and presence of corporate income taxes

**MM Approach - 1963: with tax :**

- In 1963, MM model was amended by incorporating tax, they recognized that the value of the firm will increase, or cost of capital will decrease where corporate taxes exist.
- As a result, there will be some difference in the earnings of equity and debt holders in levered and unlevered firm and value of levered firm will be greater than the value of unlevered firm by an amount equal to amount of debt multiplied by corporate tax rate.

MM has developed the following formulae for computation of cost of capital (K<sub>o</sub>). Cost of equity (K<sub>e</sub>) for the levered firm.

<p>1) Value of a levered company = value of an unlevered company + tax benefit</p> <p>Or</p> $V_g = V_u + TB$
<p>2) Cost of equity in a levered company (K<sub>eg</sub>) = <math>K_{eu} + (K_{eu} - K_d) * \text{debt} / (\text{debt} + \text{equity})</math></p> <p>Where,</p> <p>K<sub>eg</sub> = cost of equity in a levered company</p> <p>K<sub>eu</sub> = cost of equity in a Unlevered company</p> <p>K<sub>d</sub> = cost of debt</p> <p>TB = present value of tax shields</p>
<p>3) WACC in a levered company (K<sub>og</sub>) = <math>K_{eu} (1-tL)</math></p> <p>Where,</p> <p>K<sub>og</sub> = WACC of a levered company</p> <p>K<sub>eu</sub> = cost of equity in an unlevered company</p> <p>t = tax rate</p>

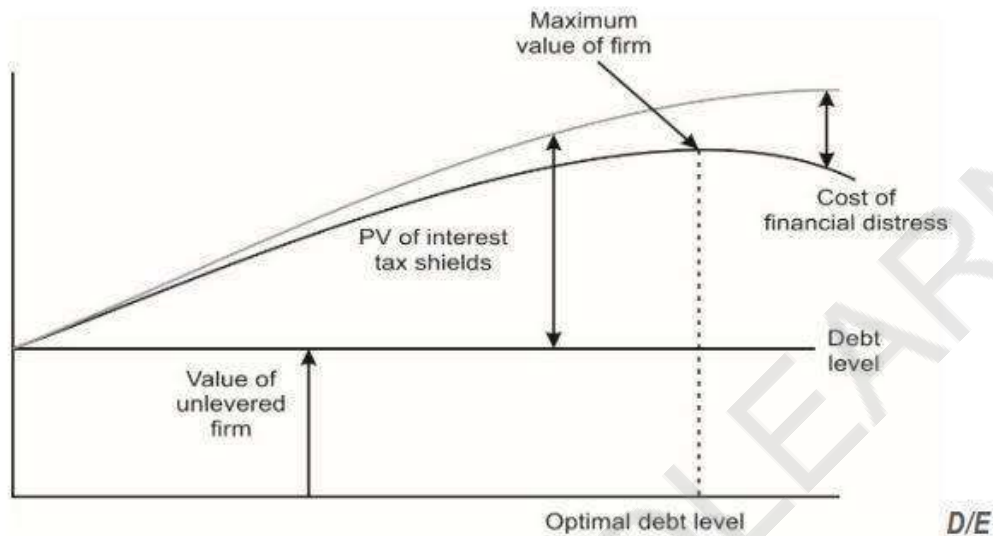
$$L = \text{debt} / (\text{debt} + \text{equity})$$

## 2.5 The trade-off theory:

- The trade - off theory of capital structure refers to the idea that a company chooses how much debt finance and how much equity finance to use by balancing the costs and benefits.
- Trade - off theory of capital structure basically entails offsetting the costs of debt against the benefits of debt. Trade - off theory of capital structure primarily deals with two concepts cost of financial distress and agency costs.
- An important purpose of the trade - off theory of capital structure is to explain the fact that corporations usually are financed partly with debt and partly with equity.
- It states that there is an advantage to financing with debt, the tax benefits of debt.
- And there is a cost of financing with debt, the costs of financial distress including bankruptcy costs of debt and non - bankruptcy costs (e.g. staff leaving, suppliers demanding disadvantageous payment terms, bondholder / stockholder infighting. etc).
- The marginal benefit of further increases in debt declines as debt increases , while the marginal cost increases , so that a firm that is optimizing its overall value will focus on this trade - off when choosing how much debt and equity to use for financing .
- Modigliani and Miller in 1963 introduced the tax benefit of debt. Later. Work led to an optimal capital structure which is given by the trade - off theory.
- According to Modigliani and Miller, the attractiveness of debt decreases with the personal tax on the interest income.
- A firm experiences financial distress when the firm is unable to cope with the debt holders ' obligations.
- If the firm continues to fail in making payments to the debt holders, the firm can even be insolvent.
- The first element of Trade - off theory of capital structure, considered as the cost of debt is usually the financial distress costs or bankruptcy costs of debt.
- The direct cost of financial distress refers to the cost of insolvency of a company.
- Once the proceedings of insolvency start, the assets of the firm may be needed to be sold at distress price, which is generally much lower than the current values of the assets.
- A huge amount of administrative and legal costs is also associated with the insolvency. Even if the company is not insolvent, the financial distress of the company may include a number of indirect costs like cost of employees, cost of customers, cost of suppliers, cost of investors, cost of managers and cost of shareholders.
- The firms may often experience a dispute of interests among the management of the firm, debt holders and shareholders.
- These disputes generally give birth to agency problems that in turn give rise to the agency costs.
- The agency costs may affect the capital structure of a firm. There may be two types of conflicts - shareholders - managers' conflict and shareholders - debt holders conflict.
- The introduction of a dynamic Trade - off theory of capital structure makes the predictions of this theory a lot more accurate and reflective of that in practice.



## Value of Firm



As the debt-equity ratio (i.e. leverage) increases, there is a trade-off between the interest tax shield and bankruptcy, causing an optimum capital structure.

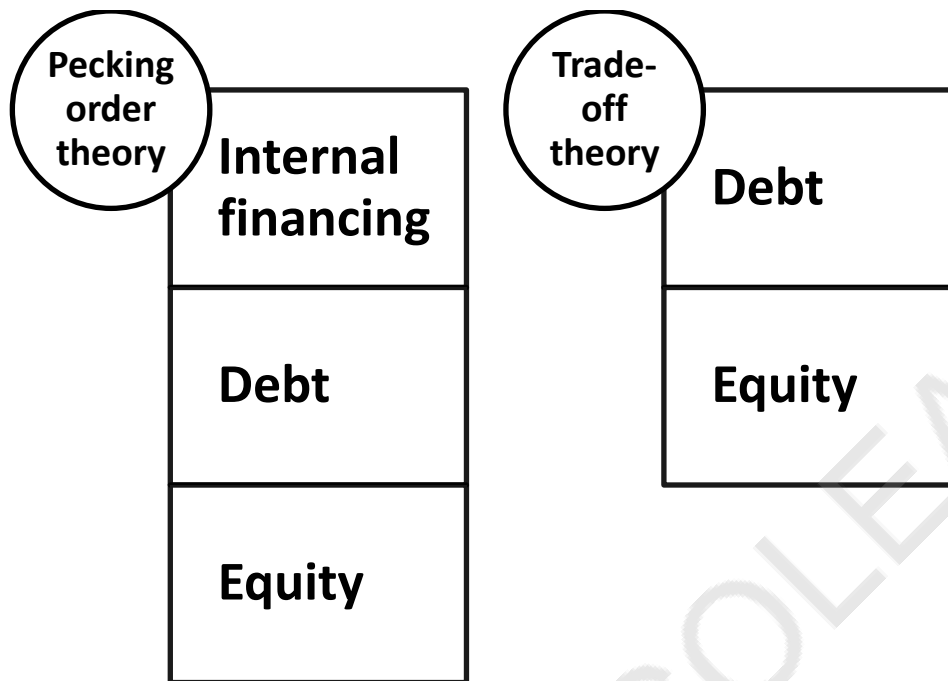
### 2.6 Pecking order theory:

This theory is based on Asymmetric information, which refers to a situation in which different parties have different information. In a firm, managers will have better information than investors. This theory states that firms prefer to issue debt when they are positive about future earnings. Equity is issued when they are doubtful and internal finance is insufficient.

- The pecking order theory argues that the capital structure decision is affected by manager's choice of a source of capital that gives higher priority to sources that reveal the least amount of information.
- Myers has given the name ' PECKING ORDER ' theory as here is no well - defined debt equity target and there are two kind of equity internal and external.
- Now Debt is cheaper than both internal and external equity because of interest. Further internal equity is less than external equity particularly because of no transaction / issue cost, no tax etc.

Pecking order theory suggests that managers may use various sources for rising of fund in the following order:

1. Managers first choice is to use internal finance.
2. In absence of internal finance, they can use secured debt, unsecured debt, hybrid debt etc.
3. Managers may issue new equity shares as a last option.



### 3. Factors determining capital structure:

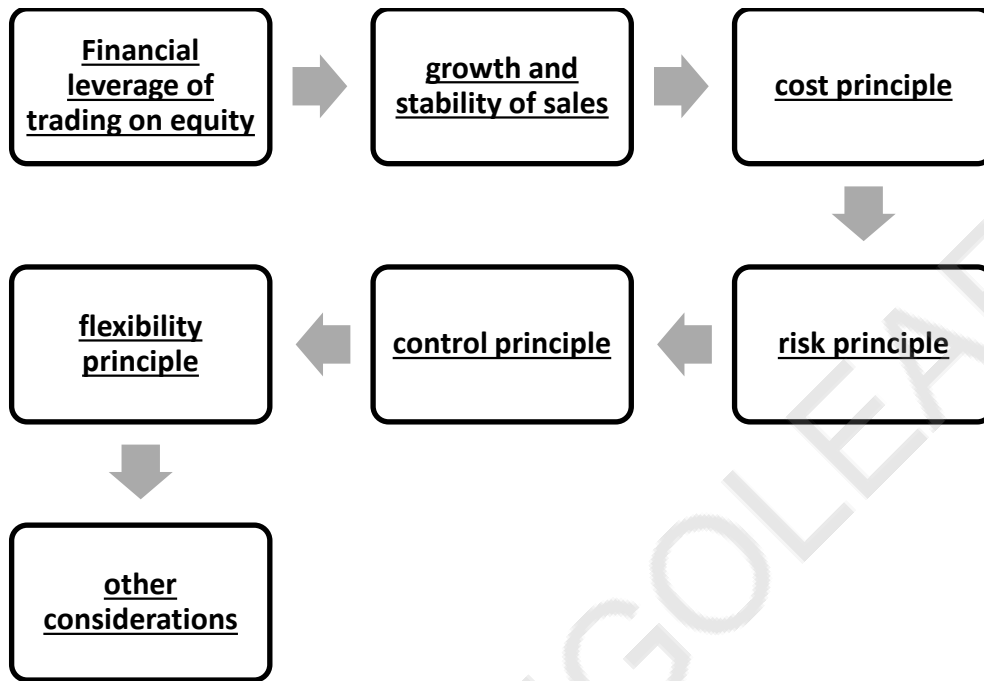
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#### 3.1 Choice of source of funds:

A firm has the choice to raise funds for financing its investment proposals from different sources in different proportions. It can :

- Exclusively use debt ( in case of existing company ) , or
- Exclusively use equity capital, or
- Exclusively use preference share capital (in case of existing company) , or
- Use a combination of debt and equity in different proportions, or
- Use a combination of debt, equity and preference capital in different. Proportions, or
- Use a combination of debt and preference capital in different proportion (in case of existing company).

### 3.2 Factors affecting capital structure:



#### 1) Financial leverage or trading on equity:

- The use of long - term fixed interest bearing debt and preference share capital along with equity share capital is called financial leverage or trading on equity.
- The use of long - term debt increases the earnings per share if the firm yields a return higher than the cost of debt.
- The earnings per share also increase with the use of preference share capital but due to the fact that interest is allowed to be deducted while computing tax, the leverage impact of debt is much more.
- However, leverage can operate adversely also if the rate of interest on long - term loan is more than the expected rate of earnings of the firm. Therefore, it needs caution to plan the capital structure of a firm.

#### 2) Growth and stability of sales:

- The capital structure of a firm is highly influenced by the growth and stability of its sales.
- If the sales of a firm are expected to remain fairly stable, it can raise a higher level of debt.
- Stability of sales ensures that the firm will not face any difficulty in meeting its fixed commitments of interest repayments of debt.
- Similarly, the rate of the growth in sales also affects the capital structure decision.
- Usually, greater the rate of growth of sales, greater can be the use of debt in the financing of firm.
- On the other hand, if the sales of a firm are highly fluctuating or declining, it should not employ, as far as possible, debt financing in its capital structure.

#### 3) Cost Principle:

- According to this principle, an ideal pattern or capital structure is one that minimizes cost of capital structure and maximizes earnings per share (EPS).
- For e.g. Debt capital is cheaper than equity capital from the point of its cost and interest being deductible for income tax purpose, whereas no such deduction is allowed for dividends.

#### 4) **Risk Principle:**

- According to this principle, reliance is placed more on common equity for financing capital requirements than excessive use of debt.
- Use of more and more debt means higher commitment in form of interest payout.
- This would lead to erosion of shareholders' value in unfavorable business situation. With increase in amount of Debt, financial risk increase. And vice versa.

#### 5) **Control Principle:**

- While designing a capital structure, the finance manager may also keep in mind that existing management control and ownership remains undisturbed.
- Issue of new equity will dilute existing control pattern and it also involves higher cost.
- Issue of more debt causes no dilution in control but causes a higher degree of financial risk.

#### 6) **Flexibility Principle:**

- By flexibility, it means that the management chooses such a combination of sources of financing which it finds easier to adjust according to changes in need of funds in future too.
- While debt could be interchanged ( If the company is loaded with a debt of 18 % and funds are available at 15 % , it can return old debt with new debt , at a lesser interest rate ) , but the same option may not be available in case of equity investment.

#### 7) **Other considerations:**

- Besides above principles, other factors such as nature of industry, timing of issue and competition in the industry should also be considered.
- Industries facing severe competition also resort to more equity than debt.

### **4. Optimal capital structure:**

Objective of financial management is to maximize wealth. Therefore, one should choose a capital structure which maximizes wealth. For this purpose, following analysis should be done:

- I. EBIT - EPS - MPS analysis: Choose a capital structure which maximizes market price per share. For that, start with same EBIT for all capital structures and calculate EPS. Thereafter, either multiply EPS by price earnings ratio or divide it by cost of equity to arrive at MPS.
- II. Indifference Point analysis: In above analysis, we have considered value at a given EBIT only. What will happen if EBIT changes? Will it change your decision also? To answer this question, you can do indifference point analysis.
- III. Financial Break - Even Point (BEP) analysis: With change in capital structure, financial risk also changes. Though this risk has already been considered in PE ratio or in cost of equity in point one above, but one may calculate and consider it separately also by calculating Financial BEP.

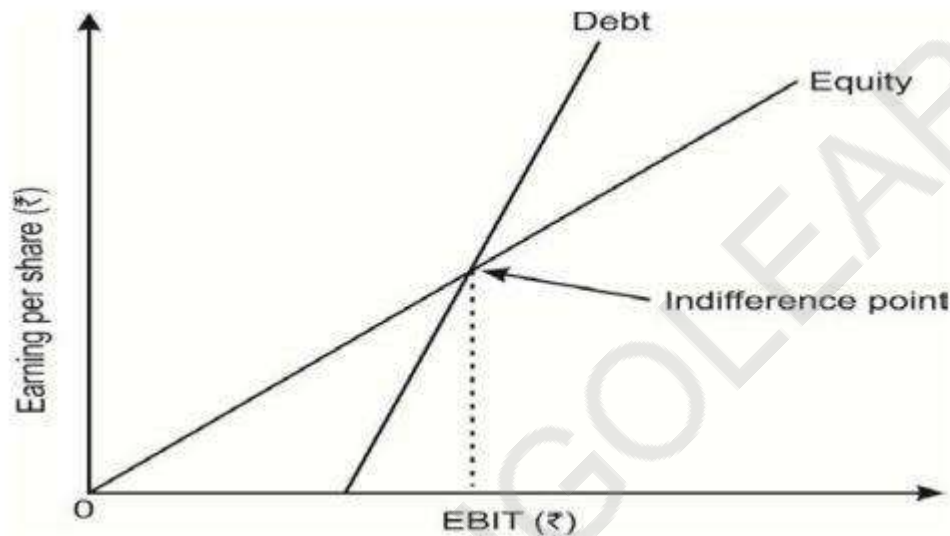
### **5. BIT-EPS-MPS analysis:**

#### **Relationship between EBIT-EPS-MPS:**

- The basic objective of financial management is to design an appropriate capital structure which can provide the highest wealth, i.e., highest MPS, which in turn depends on EPS.

- The analysis of the different types of capital structure and the effect of leverage on the expected EPS and eventually MPS will provide a useful guide to selection of a particular level of debt financing.
- The EBIT - EPS analysis is of significant importance and if undertaken properly, can be an effective tool in the hands of a financial manager to get an insight into the planning and designing of the capital structure of the firm.

### 5.1 Financial break-even point (BEP) and Indifference Point Analysis:



Financial break - even point is the minimum level of EBIT needed to satisfy all the fixed financial charges i.e. interests and preference dividends. It denotes the level of EBIT for which the company's EPS equals zero.

Financial breakeven point (BEP) can be calculated as:

$$\text{Financial breakeven point} = \frac{\text{Interest} + \text{preference dividend}}{(1 - \text{tax rate})}$$

- If the EBIT is less than the financial break - even point, then the EPS will be negative but if the expected level of EBIT is more than the break - even point, then more fixed costs financing instruments can be taken in the capital structure, otherwise, equity would be preferred.
- EBIT - EPS break - even analysis is used for determining the appropriate amount of debt a company might carry.
- Another method of considering the impact of various financing alternatives on earnings per share is to prepare the EBIT chart or the range of Earnings chart.
- This chart shows the likely EPS at various probable EBIT levels. Thus, under one particular alternative, EPS may be ₹ 2 at a given EBIT level.
- However, the EPS may go down if another alternative of financing is chosen even though the EBIT remains at the same level. At a given EBIT, earnings per share under various alternatives of financing may be plotted.
- A straight line representing the EPS at various levels EBIT under the alternative may be drawn. Wherever this line intersects, it is known as breakeven point.
- This point is a useful guide in formulating the capital structure.

- This is known as EPS equivalency point or indifference point since this shows that, between the two given alternatives of financing (i.e., 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 algebraically in the following manner:

$$[(EBIT-I_1)(1-t)] / E_1 = [(EBIT-I_2)(1-t)] / E_2$$

Where,

EBIT = Indifference point

E<sub>1</sub> = Number of equity shares in alternatives 1

E<sub>2</sub> = Number of equity shares in alternatives 2

I<sub>1</sub> = Interest charges in Alternatives 1

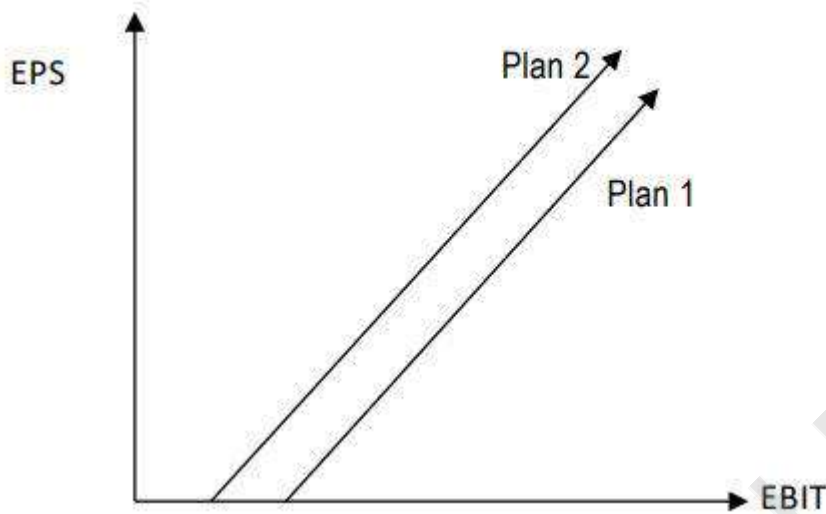
I<sub>2</sub> = Interest charges in Alternatives 2

T = tax rate

if amount of equity share capital is same under two financial plans , then one of the following two situations will arise :

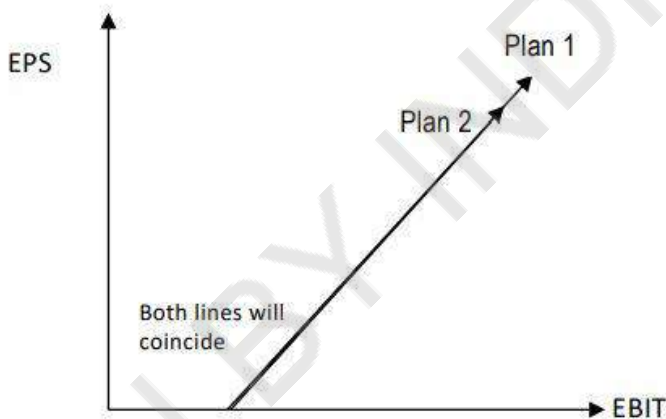
**No indifference point:**

- If after tax cost of the source other than equity shares is not same under both plans then there will be no indifference point between the two.
- Because one plan will be better than other at all levels of EBIT.
- For example, if two plans have equity shares of 1, 00,000 each. Plan 1 has 10 % debentures of 50,000 while plan 2 has 8 % Term loan of \* 50,000. Then plan 2 will be better than plan 1 at any level of EBIT and there will be no indifference point.



**Many indifference points:**

If after tax cost of the source other than equity shares is same under both plans then each EBIT will be an indifference point.



**Debt-Equity Indifference Point**

**6. Over capitalization and under capitalization:**

**Over capitalization:**

It is a situation where a firm has more capital than it needs or in other words assets are worth less than its issued share capital, and earnings are insufficient to pay dividend and interest. This situation mainly arises when the existing capital is not effectively utilized on account of fall in earning capacity of the company while company has raised funds more than its requirements. The chief sign of over capitalization is the fall in payment of dividend and interest leading to fall in value of the shares of the company.

**Causes of over capitalization:**

- Raising more money through issue of shares or debentures than company can employ profitably.
- Borrowing huge amount at higher rate than rate at which company can earn.

- Excessive payment for the acquisition of fictitious assets such as goodwill etc.
- Improper provision for depreciation, replacement of assets and distribution of dividends at a higher rate.
- Wrong estimation of earnings and capitalization.

#### **Consequences for over capitalization:**

- Considerable reduction in the rate of dividend and interest payments.
- Reduction in the market price of shares.
- Resorting to "window dressing".
- Some companies may opt for reorganization. However, sometimes the matter gets worse and the company may go into liquidation.

#### **Remedies for Over - Capitalization:**

Following steps may be adopted to avoid the negative consequences of over - capitalization:

- Company should go for thorough reorganization.
- Buyback of shares.
- Reduction in claims of debenture - holders and creditors.
- Value of shares may also be reduced. This will result in sufficient funds for the company to carry out replacement of assets.

#### **Under capitalization:**

It is just reverse of over capitalization. It is a state, when its actual capitalization is lower than its proper capitalization as warranted by its earning capacity. This situation normally happens with companies which have insufficient capital but large secret reserves in the form of considerable appreciation in the values of the fixed assets not brought into the books.

#### **Consequences of Under - Capitalization:**

Under - capitalization results in the following consequences:

- The dividend rate will be higher in comparison to similarly situated companies.
- Market value of shares will be higher than value of shares of other similar companies because their earning rate being considerably more than the prevailing rate on such securities.
- Real value of shares will be higher than their book value.

#### **Effects of Under - Capitalization:**

Under - capitalization has the following effects:

- It encourages acute competition. High profitability encourages new entrepreneurs to come into same type of business.
- High rate of dividend encourages the workers ' union to demand high wages.
- Normally common people (consumers) start feeling that they are being exploited.
- Management may resort to manipulation of share values.
- Invite more government control and regulation on the company and higher taxation also.



### **Remedies for Under - Capitalization:**

Following steps may be adopted to avoid the negative consequences of under - capitalization:

- The shares of the company should be split up. This will reduce dividend per share, though EPS shall remain unchanged.
- Issue of Bonus Shares is the most appropriate measure as this will reduce both dividend per share and the average rate of earning.
- By revising upward the par value of shares in exchange of the existing shares held by them.

### **Over - Capitalization vis - à - vis Under – Capitalization:**

- From the above discussion it can be said that both over - capitalization and under capitalization are not good. However, over - capitalization is more dangerous to the company, shareholders and the society than under - capitalization.
- The situation of under - capitalization can be handled more easily than the situation of over capitalization.
- Moreover, under - capitalization is not an economic problem but a problem of adjusting capital structure.

Thus, under - capitalization should be considered less dangerous but both situations are bad and every company should strive to have a proper capitalization.

## CHAPTER 5 – FINANCIAL DECISIONS – CAPITAL STRUCTURE ILLUSTRATIONS

### Illustration-1 (Net Income Approach)

Rupa Ltd.'s EBIT is Rs 5,00,000. The company has 10%, 20 lakhs 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

### Illustration-2 (Net Income approach)

Indra Ltd. has EBIT of Rs 1,00,000. The company makes use of debt and equity capital. The firm has 10% debentures of Rs 5,00,000 and the firm's equity capitalization rate is 15%.

You are required to compute:

- (i) Current value of the firm
- (ii) Overall cost of capital.

### Illustration-3 (NOI Approach)

Amita Ltd.'s operating income is Rs 5,00,000. The firm's cost of debt is 10% and currently the firm employs Rs 15,00,000 of debt. The overall cost of capital of the firm is 15%.

You are required to determine:

- (i) Total value of the firm.
- (ii) Cost of equity.

### Illustration – 4 (NOI Approach)

Z Ltd.'s operating income (before interest and tax) is Rs. 9,00,000. The firm's cost of debt is 10 per cent and currently firm employs Rs. 30,00,000 of debt. The overall cost of capital of firm is 12%.

Required:

Calculate cost of equity

### Illustration – 5 (NOI Approach- 2 firms)

Alpha Limited and Beta Limited are identical except for capital structures. Alpha Ltd. has 50 per cent debt and 50 per cent equity, whereas Beta Ltd. has 20 per cent debt and 80 per cent equity. (All percentages are in market-value terms). The borrowing rate for both companies is 8 per cent in a no-tax world, and capital markets are assumed to be perfect.

(a) (i) If you own 2 per cent of the shares of Alpha Ltd., what is your return if the company has net operating income of Rs 3,60,000 and the overall capitalization rate of the company,  $K_0$  is 18 per cent?

(ii) What is the implied required rate of return on equity?

(b) Beta Ltd. has the same net operating income as Alpha Ltd.

(i) What is the implied required equity return of Beta Ltd.?

(ii) Why does it differ from that of Alpha Ltd.?

#### **Illustration 6 (MM Approach- without tax)**

One-third of the total market value of Sanghmani Limited consists of loan stock, which has a cost of 10 per cent. Another company, Samsui Limited, is identical in every respect to Sanghmani Limited, except that its capital structure is all-equity, and its cost of equity is 16 per cent. According to Modigliani and Miller, if we ignored taxation and tax relief on debt capital, what would be the cost of equity of Sanghmani Limited?

#### **Illustration 7 (MM Approach- with tax)**

There are two firms P and Q which are identical except P does not use any debt in its capital structure while Q has Rs. 8,00,000, 9% debentures in its capital structure. Both the firms have earnings before interest and tax of Rs. 2,60,000 p.a. and the capitalization rate are 10%. Assuming the corporate tax of 30%, calculate the value of these firms according to MM Hypothesis

#### **Illustration 8 (MM Approach- with tax)**

RES Ltd. is an all equity financed company with a market value of Rs. 25,00,000 and cost of equity  $K_e = 21\%$ . The company wants to buyback equity shares worth Rs. 5,00,000 by issuing and raising 15% perpetual debt of the same amount.

Rate of tax may be taken as 30%. After the capital restructuring and applying MM Model (with taxes), you are required to calculate:

- (i) Market value of RES Ltd.
- (ii) Cost of Equity  $K_e$
- (iii) Weighted average cost of capital and comment on it.

#### **Illustration 9 (Arbitrage)**

There are two company N Ltd. and M Ltd., having same earnings before interest and taxes i.e. EBIT of Rs. 20,000. M Ltd. is a levered company having a debt of Rs.1,00,000 @ 7% rate of interest. The cost of equity of N Ltd. is 10% and of M Ltd. is 11.50%. Find out how arbitrage process will be carried on?

#### **Illustration 10 (Arbitrage)**

There are two companies U Ltd. and L Ltd., having same NOI of Rs. 20,000 except that L Ltd. is a levered company having a debt of Rs. 1,00,000 @ 7% and cost of equity of U Ltd. & L Ltd. are 10% and 18% respectively. Show how the arbitrage process will work.

#### **Illustration 11 ( Capital structure decisions-existing and new)**

Best of Luck Ltd., a profit making company, has a paid-up capital of Rs. 100 lakhs consisting of 10 lakhs ordinary shares of Rs. 10 each. Currently, it is earning an annual pre-tax profit of Rs. 60 lakhs. The company's shares are listed and are quoted in the range of Rs. 50 to Rs. 80. The management wants to diversify production and has approved a project which will cost Rs. 50 lakhs and which is expected to yield a pre-tax income of Rs. 40 lakhs per annum.

To raise this additional capital, the following options are under consideration of the management:

- (a) To issue equity share capital for the entire additional amount. It is expected that the new shares (face value of Rs. 10) can be **sold at a premium of Rs.15.**
- (b) To issue 16% non-convertible debentures of Rs.100 each for the entire amount.
- (c) To issue equity capital for Rs.25 lakhs (face value of Rs. 10) and 16% non-convertible debentures for the balance amount. In this case, the company can issue shares **at a premium of Rs. 40 each.**

You are required to advise the management as to how the additional capital can be raised, keeping in mind that the management wants to maximise the earnings per share to maintain its goodwill. The company is paying income tax at 50%.

### **Illustration 12 ( Capital structure decisions-Debt 3 options)**

Shahji Steels Limited requires Rs.25,00,000 for a new plant. This plant is expected to yield EBIT of Rs.5,00,000. While deciding about the financial plan, the company considers the objective of maximizing 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 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 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?

### **Illustration 13 (EPS under different options)**

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.

### **Illustration 14 (Indifference point)**

Ganesha Limited is setting up a project with a capital outlay of Rs. 60,00,000. It has two alternatives in financing the project cost.

Alternative-I: 100% equity finance by issuing equity shares of Rs. 10 each

Alternative-II: Debt-equity ratio 2:1 (issuing equity shares of Rs. 10 each)

The rate of interest payable on the debts is 18% p.a. The corporate tax rate is 40%. Calculate the indifference point between the two alternative methods of financing.

### Illustration 15 (Indifference point)

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 Rs.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.

### Illustration 16 (Indifference point)

Alpha Limited requires funds amounting to Rs 80 lakhs for its new project. To raise the funds, the company has following two alternatives:

(i) To issue Equity Shares of Rs 100 each (at par) amounting to Rs 60 lakhs and borrow the balance amount at the interest of 12% p.a.; (or)

(ii) To issue Equity Shares of Rs 100 each (at par) and 12% Debentures in equal proportion,

The Income-tax rate is 30%.

Find out the point of indifference between the available two modes of financing and state which option will be beneficial in different situations.

### Illustration 17 (EPS, indifference point, BEP)

Ganapati Limited is considering three financing plans. The key information is as follows:

(a) Total investment to be raised Rs 2,00,000

(b) Plans of Financing Proportion:

Plans	Equity	Debt	Preference Shares
A	100%	-	-
B	50%	50%	-
C	50%	-	50%

(c) Cost of debt 8% Cost of preference shares 8%

(d) Tax rate 50%

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

(f) Expected EBIT is Rs 80,000.

You are required to determine for each plan: -

(i) Earnings per share (EPS) (ii) The financial break-even point.

(iii) Indicate if any of the plans dominate and compute the EBIT range among the plans for indifference.

### Illustration 18 (Indifference point)

1FIN by IndigoLearn

X Ltd. is considering the following two alternative financing plans:

	<b>Plan - I</b>	<b>Plan – II</b>
	Rs.	Rs.
Equity shares of Rs. 10 each	4,00,000	4,00,000
12% Debentures	2,00,000	-
Preference Shares of Rs. 100 each	-	2,00,000
	<b>6,00,000</b>	<b>6,00,000</b>

The Indifference point between the plans is Rs. 2,40,000. Corporate tax rate is 30%. Calculate the rate of dividend on preference share.

### Illustration 19 ( effect on EPS- 3 options)

Suppose that a firm has an all equity capital structure consisting of 100,000 ordinary shares of Rs 10 per share. The firm wants to raise Rs 250,000 to finance its investments and is considering three alternative methods of financing –

- (i) to issue 25,000 ordinary shares at Rs10 each,
- (ii) to borrow Rs 2,50,000 at 8 per cent rate of interest,
- (iii) to issue 2,500 preference shares of Rs100 each at an 8 per cent rate of dividend.

If the firm's earnings before interest and taxes after additional investment are Rs 3,12,500 and the tax rate is 50 per cent. Show the effect on the earnings per share under the three financing alternatives.

### Illustration 20

Yoyo Limited presently has Rs 36,00,000 in debt outstanding bearing an interest rate of 10%. It wishes to finance a Rs 40,00,000 expansion programme and is considering three alternatives:

- Additional debt at 12% interest;
- Preference stock with an 11% dividend; and
- The issue of common stock at Rs 16 per share.

The company presently has 8,00,000 shares outstanding and is in a 40% tax bracket.

- a) If earnings before interest and taxes are presently Rs 15,00,000, what would be earnings per share for the three alternatives, assuming no immediate increase in profitability?
- b) Develop an indifference chart for these alternatives. What are the approximate indifference points? To check one of these points, what is the indifference point mathematically between debt and common?

Which alternative do you prefer? How much would EBIT need to increase before the next alternative would be best?

### Illustration 21 – 1(a) Nov 2018

Y Ltd. Requires Rs 5000000 for a new project. This project is expected to yield earnings before interest and taxes of Rs 1000000. While deciding about the financial plan the company considers the objective of maximizing earnings per share. It has two alternatives to finance the project

- **By raising debt**
- Rs 500000 or
- Rs 2000000
- **By issuing equity shares**

The company's share is currently selling at Rs 300 but is expected to decline to Rs 250 in case the funds are borrowed in excess of Rs 20 lakhs. The funds can be borrowed at the rate of 12% upto Rs 500000 and 10% over Rs 500000. The Tax rate applicable to the company is 25%.

### Illustration 22 - Nov 2018

The following data relates to two companies belonging to same risk class:

Particulars	A Ltd.	B Ltd.
Expected Net Operating Income	'18,00,000	'18,00,000
12% Debt	'54,00,000	–
Equity Capitalization Rate	–	18%

Required:

- a) Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming No taxes as per M.M. approach.
- b) Determine the total Market value, Equity Capitalization rate and weighted average cost of capital for each company assuming 40% taxes as per M.M. approach.

### Illustration 23 ( Q3 RTP Nov 2020)

Xylo Ltd. is considering two alternative financing plans as follows:

Particulars	Plan – A (Rs.)	Plan – B (Rs.)
Equity shares of Rs. 10 each	8,00,000	8,00,000
Preference Shares of Rs. 100 each	–	4,00,000
12% Debentures	4,00,000	–
	12,00,000	12,00,000

The indifference point between the plans is Rs.4,80,000. Corporate tax rate is 30%. Calculate the rate of dividend on preference share

### Illustration 24 ( Q2 May 2019)

RM Steels Limited requires Rs. 10,00,000 for construction of a new plant. It is considering three financial plans:

- i. The company may issue 1,00,000 ordinary shares at Rs. 10 per share.
- ii. The company may issue 50,000 ordinary shares at Rs. 10 per share and 5000 debentures of Rs. 100 denominations bearing an 8 per cent rate of interest; and
- iii. The company may issue 50,000 ordinary shares at Rs. 10 per share and 5,000 preference shares at Rs. 100 per share bearing an 8 per cent rate of dividend.

If RM Steels Limited's earnings before interest and taxes are Rs. 20,000; Rs. 40,000; Rs. 80,000; Rs. 1,20,000 and Rs. 2,00,000.

- (a) You are required to compute the earnings per share under each of the three financial plans?  
 (b) Which alternative would you recommend for RM steels and why? Tax rate is 50%

**Illustration 25 ( Q 1(a) May 2018)**

Stopgo Ltd, an all equity financed company, is considering the repurchase of Rs. 200 lakhs equity and to replace it with 15% debentures of the same amount.

- Current market Value of the company is Rs. 1140 lakhs and it's cost of capital is 20%.
- It's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future.
- It's entire earnings are distributed as dividend.
- Applicable tax rate is 30 per cent.

You are required to calculate the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Hypothesis:

- (i) The market value of the company  
 (ii) It's cost of capital, and  
 (iii) It's cost of equity

**Illustration 26 ( Q 1(d) May 2018)**

Sun Ltd. is considering two financing plans. Details of which are as under:

- (i) Fund's requirement – Rs. 100 Lakhs  
 (ii) Financial Plan

Plan	Equity	Debt	
I	100%	-	Rs. 100 Lakhs Equity
II	25%	75%	Rs. 25 lakhs Equity and Rs. 75 Lakhs Debt

- (iii) Cost of debt – 12% p.a.  
 (iv) Tax Rate – 30%  
 (v) Equity Share Rs. 10 each, issued at a premium of Rs. 15 per share  
 (vi) Expected Earnings before Interest and Taxes (EBIT) Rs. 40 Lakhs

You are required to compute:

- (i) EPS in each of the plan  
 (ii) The Financial Break-Even Point  
 (iii) Indifference point between Plan I and plan II

**Illustration 27 ( Q 3 May 2018 RTP)**

Company P and Q are identical in all respects including risk factors except for debt/equity,

- company P having issued 10% debentures of ₹ 18 lakhs while company Q is unlevered.
- Both the companies earn 20% before interest and taxes on their total assets of ₹ 30 lakhs.
- Assuming a tax rate of 50% and capitalization rate of 15% from an all-equity company

CALCULATE the value of companies P and Q using

- (i) Net Income Approach and  
 (ii) Net Operating Income Approach.

**Illustration 28 (Q 3 May 2019 RTP)**



Akash Limited provides you the following information:

(₹)	
Profit (EBIT)	2,80,000
Less: Interest on Debenture @ 10%	(40,000)
EBT	2,40,000
Less Income Tax @ 50%	(1,20,000)
	1,20,000
No. of Equity Shares (₹ 10 each)	30,000
Earnings per share (EPS)	4
Price /EPS (PE) Ratio	10

- The company has reserves and surplus of ₹ 7,00,000 and required ₹ 4,00,000 further for modernisation.
- Return on Capital Employed (ROCE) is constant.
- Debt (Debt/ Debt + Equity) Ratio higher than 40% will bring the P/E Ratio down to 8 and increase the interest rate on additional debts to 12%.

You are required to ascertain the probable price of the share

- If the additional capital are raised as debt; and
- If the amount is raised by issuing equity shares at ruling market prices.

#### Illustration 29 (May 2019)

Vikalp Ltd. provides you the following information for the year ending 31.03.2019:

		Amount (Rs)
Earnings before interest and tax		28,80,000
Less:	Interest on long-term loans @12%	2,70,000
Interest on Debentures @10% (Debentures issued on 01.08.2018)		3,60,000
Earnings before tax		22,50,000
Less:	Tax @ 30%	6,75,000
Earnings after tax		15,75,000
6,30,000 equity shares (of Rs. 10 each)		
Ruling market price per share		24
Undistributed reserves and surplus		60,50,000

The company needs to raise Rs. 30,00,000 for modernisation of its plants and has the following options of raising the funds:

- Raise the entire funds by 13% long-term loan or
- Raise partly by issue of 75,000 equity shares @ Rs. 20 per share and the balance by 11% debentures.

The company expects the rate of return on funds employed to be improved by 3% because of modernisation and that if Debt Equity ratio  $[\text{Debt} / (\text{Debt} + \text{Equity})]$  exceeds 45%, then price earnings ratio is to go down by 15%.

Required: If the company is to follow policy of maximising the market value of equity share, which option should it choose?

### Illustration 30 (RTP Nov 21)

Blue Ltd., an all equity financed company is considering the repurchase of Rs. 275 lakhs equity shares and to replace it with 15% debentures of the same amount. Current market value of the company is Rs. 1,750 lakhs with its cost of capital of 20%. The company's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future years. The company also has a policy of distributing its entire earnings as dividend.

Assuming the corporate tax rate as 30%, you are required to CALCULATE the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Approach: (i) Market value of the company (ii) Overall Cost of capital (iii) Cost of equity

### Illustration 31

Leo Ltd. has a net operating income of ₹ 21,60,000 and the total capitalisation of ₹ 120 lakhs. The company is evaluating the options to introduce debt financing in the capital structure and the following information is available at various levels of debt value.

Debt value (₹)	Interest rate (%)	Equity Capitalisation rate (%)
0	N.A.	12.00
10,00,000	7.00	12.50
20,00,000	7.00	13.00
30,00,000	7.50	13.50
40,00,000	7.50	14.00
50,00,000	8.00	15.00
60,00,000	8.50	16.00
70,00,000	9.00	17.00
80,00,000	10.00	20.00

You are required to COMPUTE the equity capitalization rate if MM approach is followed. Assume that the firm operates in zero tax regime and calculations to be based on book values.

### Illustration 32

Axar Ltd. has a Sales of ₹ 68,00,000 with a Variable cost Ratio of 60%.

The company has fixed cost of ₹16,32,000. The capital of the company comprises of 12% long term debt, ₹ 1,00,000 Preference Shares of ₹ 10 each carrying dividend rate of 10% and 1,50,000 equity shares.

The tax rate applicable for the company is 30%.

At current sales level, DETERMINE the Interest, EPS and amount of debt for the firm if a 25% decline in Sales will wipe out all the EPS.

### Illustration 33

The financial advisor of Sun Ltd. is confronted with following two alternative financing plans for raising ₹ 10 lakhs that is needed for plant expansion and modernization

**Alternative I:** Issue 80% of funds with 14% Debenture [Face value (FV) ₹ 100] at par and redeem at a premium of 10% after 10 years and balance by issuing equity shares at 33.33% Premium.

**Alternative II:** Raise 10% of funds required by issuing 8% Irredeemable Debentures [Face value (FV) ₹ 100] at par and the remaining by issuing equity shares at current market price of ₹125

Currently, the firm has an Earnings per share (EPS) of ₹ 21

The modernization and expansion programme is expected to increase the firm's Earnings before Interest and Taxation (EBIT) by ₹ 200,000 annually.

The firm's condensed Balance Sheet for the current year is given below:

**Balance Sheet as on 31.3.2022**

<b>Liabilities</b>	<b>(₹)</b>	<b>Assets</b>	<b>(₹)</b>
Current Liabilities	5,00,000	Current Assets	16,00,000
10% Long Term Loan	15,00,000	Plant & Equipment (Net)	34,00,000
Reserves & Surplus	10,00,000		
Equity Share Capital (FV: ₹ 100 each)	20,00,000		
<b>TOTAL</b>	<b>50,00,000</b>	<b>TOTAL</b>	<b>50,00,000</b>

However, the finance advisor is concerned about the effect that issuing of debt might have on the firm. The average debt ratio for firms in industry is 35%. He believes if this ratio is exceeded, the P/E ratio of the company will be 7 because of the potentially greater risk.

If the firm increases its equity capital by more than 10 %, he expects the P/E ratio of the company will increase to 8.5 irrespective of the debt ratio.

Assume Tax Rate of 25%. Assume target dividend pay-out under each alternative to be 60% for the next year and growth rate to be 10% for the purpose of calculating Cost of Equity.

SUGGEST with reason which alternative is better on the basis of each of the below given criteria:

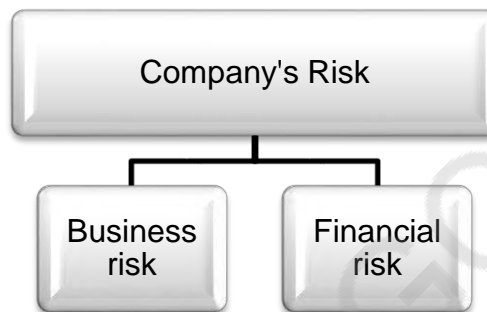
- I. Earnings per share (EPS) & Market Price per share (MPS)
- II. Financial Leverage
- III. Weighted Average Cost of Capital & Marginal Cost of Capital (using Book Value weights)

## CHAPTER 6

### Financing decisions- LEVERAGE

#### 1 Introduction

Value is directly related to performance of company & inversely related to investor's return. Investor's return based on Risk of the company



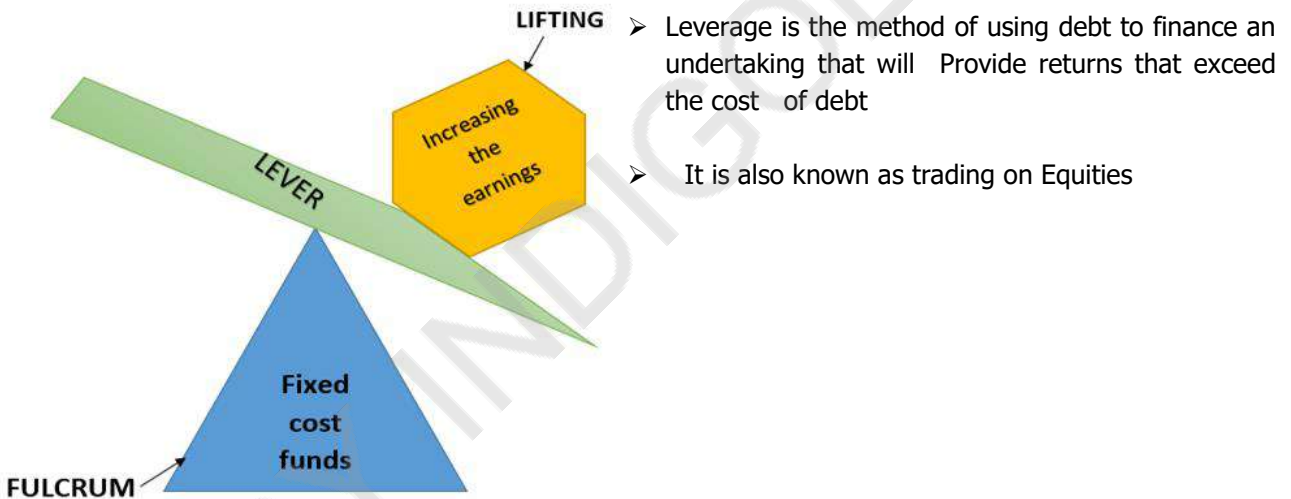
Business risk vs Financial risk

Basis of differences	Business Risk	Financial Risk
<b>Meaning</b>	The risk of insufficient profit, to meet out the expenses is known as Business Risk.	Financial Risk is the risk arising due to the use of debt financing in the capital structure.
<b>Evaluation</b>	Variability is EBIT	Leverage Multiplier and Debt to asset ratio.
<b>Connected with</b>	Economic environment	Use of debt capital
<b>Minimization</b>	The risk cannot be minimized.	If the firm does not use debt funds, there will be no risk.

<b>Types</b>	Compliance risk, operational risk, reputation risk, financial risk, strategic risk etc.	Credit risk, Market risk, Liquidity risk, exchange rate risk, etc.
<b>Disclosed by</b>	Difference in net operating income and net cash flows.	Difference in the return of equity shareholders.

## 2 Meaning of Leverage

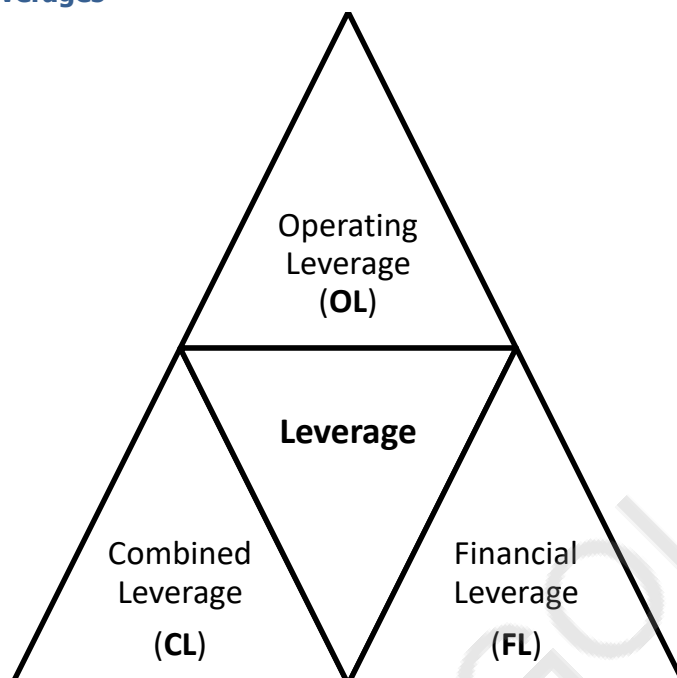
- The concept of leverage has its origin in science. It means influence of one force over another.
- In the context of financial management, the term 'leverage' means sensitiveness of one financial variable to change in another.



**Example-** If the business used 2 Lacs of its money of its money & 2 Lacs of borrowed cash to buy the piece of land; the company is using financial leverage  
 If same business borrows the entire sum of % Lacs to purchase the property, that business is considered to be highly leveraged.

$$\text{Leverage} = \frac{\text{Change in Y} \div \text{Y}}{\text{Change in X} \div \text{X}}$$

## 2.1 Types of Leverages



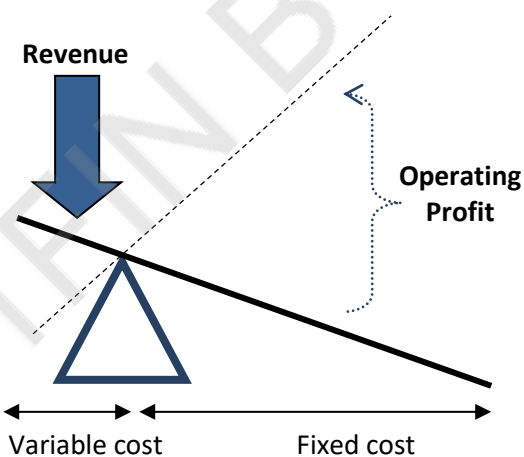
### 3 Relationship between Operating leverage (OL), Financial leverage (FL), Combined leverage (CL)

COMPARISON	OPERATING LEVERAGE	FINANCIAL LEVERAGE
<b>Meaning</b>	Use of such assets in the company's operations for which it has to pay fixed costs is known as Operating Leverage.	Use of debt in a company's capital structure for which it has to pay interest expenses is known as Financial Leverage.
<b>Measures</b>	Effect of Fixed operating costs.	Effect of Interest expenses
<b>Relates</b>	Sales and EBIT	EBIT and EPS
<b>Ascertained by</b>	Company's Cost Structure	Company's Capital Structure
<b>Preferable</b>	Low	High, only when ROCE is higher
<b>Formula</b>	$DOL = \text{Contribution} / \text{EBIT}$	$DFL = \text{EBIT} / \text{EBT}$
<b>Risk</b>	It gives rise to business risk.	It gives rise to financial risk.

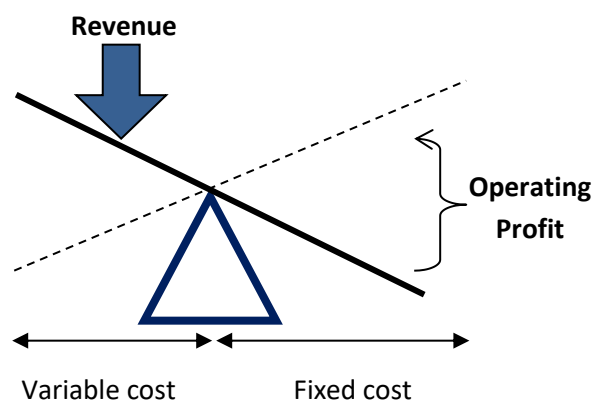
Sales	XXX	}	<b>Operating Leverage</b>	}	<b>Combined Leverage</b>
(-)Variable cost	XXX				
<b>Contribution</b>	<b>XXX</b>				
(-)Fixed cost	XXX	}	<b>Financial Leverage</b>		
<b>Operating Profit/EBIT</b>	<b>XXX</b>				
(-)Interest	XXX				
<b>Earnings before Tax (EBT)</b>	<b>XXX</b>	}	<b>Financial Leverage</b>		
(-)Tax	XXX				
<b>Profit after Tax (PAT)</b>	<b>XXX</b>				
(-)Preference Dividend (if any)	XXX	}	<b>Financial Leverage</b>		
<b>Net earnings available to Equity shareholders/PAT</b>	<b>XXX</b>				
No. Of Equity shares (N)	XXX	}	<b>Financial Leverage</b>		
<b>Earnings per Share (EPS) = PAT ÷ N</b>	<b>XXX</b>				

#### 4 Operating Leverage

- ✓ It may be defined as the employment of an asset with a fixed cost so that enough revenue can be generated to cover all the fixed and variable costs.
- ✓ Operating leverage is **a measure the degree to which a firm can increase operating income by increasing revenue..**



**Low level Leverage**



**High level Leverage**

- ✓ It is the Relationship between Sales & EBIT and indicates business risk

$$\text{Operating Leverage} = \text{Contribution} / \text{EBIT}$$

- ✓ Some companies earn less profit on each sale but can have a lower sales volume and still generate enough to cover fixed costs.
- ✓ **For example**, a software business has greater fixed costs in developers' salaries and lower variable costs in software sales. As such, the business has high operating leverage.

### Degree of Operating leverage (DOL)

The degree of operating leverage measures how much a company's operating income changes in response to a change in sales. The DOL ratio assists analysts in determining the impact of any change in sales on company earnings.



**Degree of Operating Leverage Formula**

$$= \frac{\% \text{ Change in EBIT}}{\% \text{ Change in Sales}}$$


Degree of Operating Leverage can never be zero and one. It can be zero and less or it can be one or more.

$$DOL = \frac{\frac{\Delta EBIT}{EBIT}}{\frac{\Delta Q}{Q}}$$

Here EBIT= Q(S-V)-F ; Q=Sales Quantity; S=Selling price per unit; V=Variable cost per unit; Δ denotes change

#### 4.1 Operating Leverage connection with Break-even point

$$\text{Break-even Point} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}}$$

Operating leverage & Break-even point is directly proportioned to each other.

Firm with High leverage↑	-	Higher Break-even Point	↘
Firm with Low leverage↓	-	Lower Break-even Point	↘

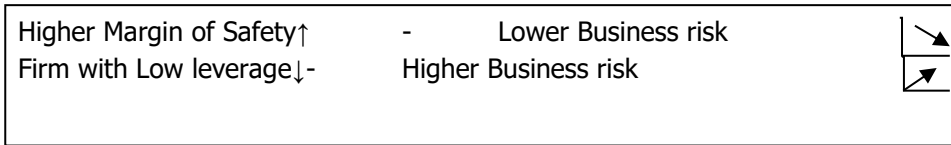
High Fixed cost -> High DOL  
 Low Fixed cost -> Low DOL

#### 4.2 Operating Leverage connection with Margin of Safety

$$\text{Margin of Safety} = \frac{\text{Sales} - \text{Break even sales}}{\text{Sales}} \times 100$$

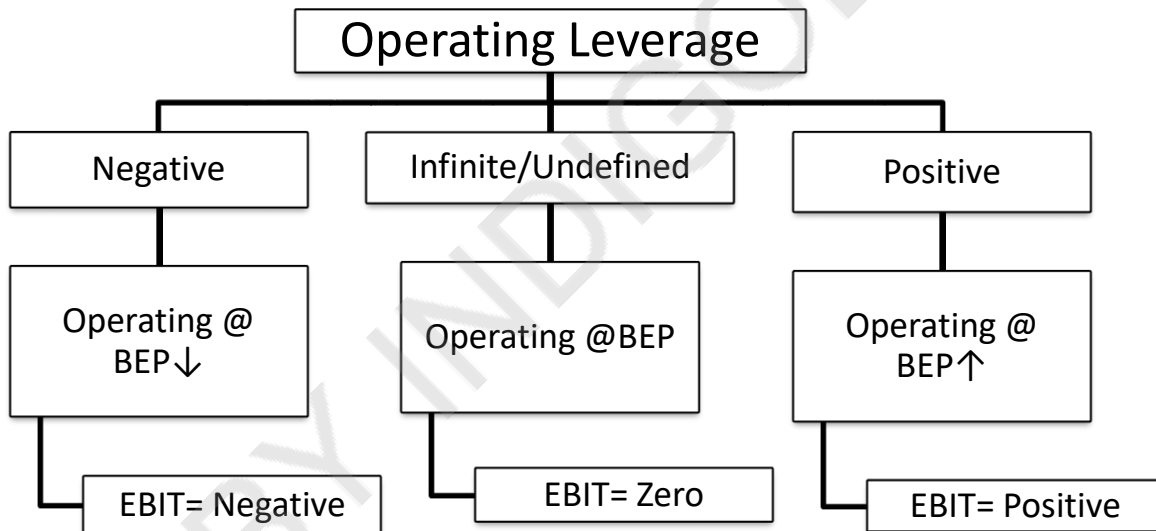


Operating leverage & Margin of Safety is inversely proportioned to each other.



$$\text{MOS} = \frac{\text{Contribution} - \text{Fixed cost}}{\text{Contribution}} = \frac{\text{EBIT}}{\text{Contribution}}$$

Degree of Operating Leverage	=	$\frac{1}{\text{Margin of Safety}}$	=	$\frac{\text{Contribution}}{\text{EBIT}}$
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## 5 Financial Leverage

The utilization of such sources of funds which carry fixed financial charges in company's financial structure, to earn more return on investment is known as Financial Leverage.

$$\text{Financial Leverage} = \text{EBIT} / \text{EBT}$$

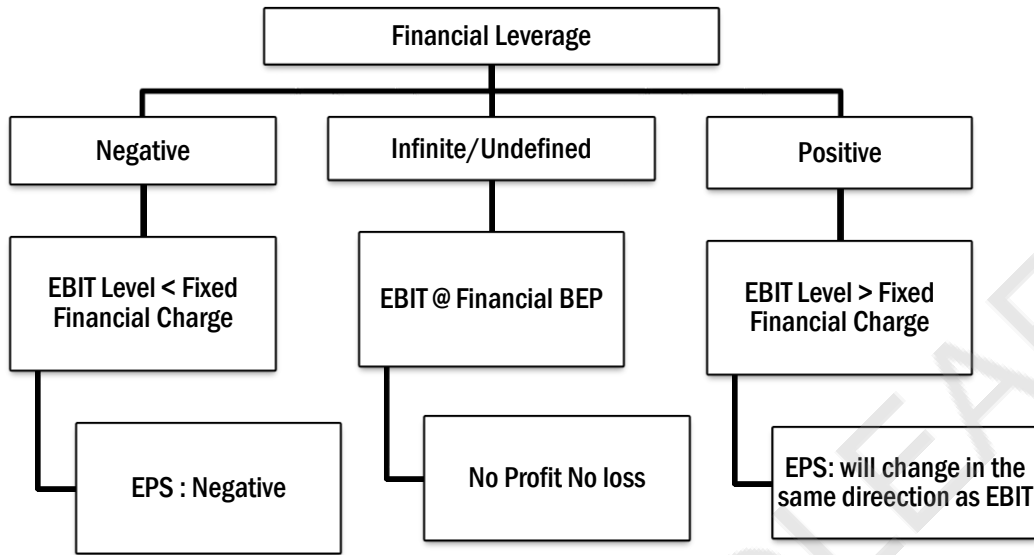
The Degree of Financial Leverage (DFL) is used to measure the effect on Earnings per Share (EPS) due to the change in firms operating profit i.e. EBIT.

**Degree of** = **% Change in EPS**

**Financial Leverage**                      **% Change in EBT**

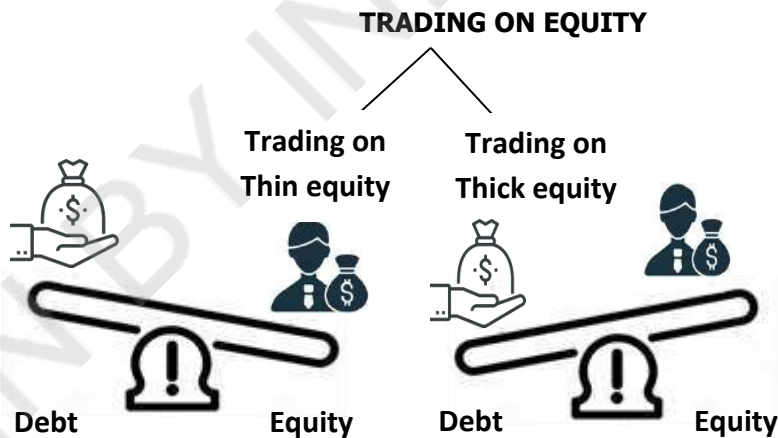
**Analysis and Interpretation of Financial Leverage**

Situation		Result	
	No fixed financial cost		No financial Leverage
	Higher Financial cost		High financial Leverage
	EBIT > Financial BEP		+ve Financial Leverage
	EBIT < Financial BEP		-ve Financial Leverage



### 5.1 Financial Leverage as 'Trading of Equity'

- ✓ It means taking advantage of the stock of equity capital to secure more borrowed funds with a view to ultimately benefiting the equity shareholders; it is the equity that is traded upon.
- ✓ To procure debt and enhance the earnings of shareholders. A company utilises its equity strength to avail debts from creditors



When the proportion of equity capital to total capital is low, its 'THIN', the reverse position is to be 'THICK'.

## 5.2 Financial Leverage as 'Double Edge Sword'

- ✓ When cost of 'Fixed cost fund' is less than Return on Investment (ROI), financial leverage will help to increase return on equity and EPS. The firm will benefit from the saving of tax on interest on debts etc.
- ✓ When cost of debt will be more than return, it will affect return of equity and EPS unfavourably and as a result firm can be under financial distress.



also

That's why financial leverage is known as DOUBLE EDGED SWORD.

## 6 Combined Leverage

It is defined as the potential use of fixed costs, both operating and financial, which magnifies the effect of sales volume change on the earning per share of the firm.

$$\begin{aligned}\text{Combined Leverage (CL)} &= \text{Operating Leverage (OL)} \times \text{Financial Leverage (FL)} \\ &= \frac{C}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} \\ &= C \div \text{EBIT}\end{aligned}$$

### Degree of Combined Leverage

It is the ratio of Percentage change in earning per share to the percentage change in sales. It indicates the effect the changes in sales will have on EPS

$$\begin{aligned}\text{DCL} &= \text{DOL} \times \text{DFL} \\ &= \frac{\% \text{ Change in EBIT}}{\% \text{ Change in Sales}} \times \frac{\% \text{ Change in EPS}}{\% \text{ Change in EBIT}} \\ &= \frac{\% \text{ Change in EPS}}{\% \text{ Change in Sales}}\end{aligned}$$

### Analysis and Interpretation of Combined Leverage

DOL	DFL	Remarks
↓	↓	Total Risk is Low but can't take advantage of trading on equity
↑	↑	Total Risk is high. Very risky combination.
↑	↓	Total Risk is Moderate. Not a good Combination. Low EBIT due to higher DOL and lower advantage of trading on equity due to low DFL.
↓	↑	Total Risk is Moderate. Best Combination. Higher financial risk is balanced by lower total business risk

### FINANCIAL DECISIONS – LEVERAGES ILLUSTRATIONS

A firm has Sales of Rs. 40 lakhs; Variable cost of Rs. 25 lakhs; Fixed cost of Rs. 6 lakhs; 10% debt of Rs. 30 lakhs; and Equity Capital of Rs. 45 lakhs.

**Required:**

Calculate operating and financial leverage.

**Illustration 2 (OL, FL, CL)**

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 are Rs.10,00,000 (Rs. 100 each).

**Calculate:**

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

### Illustration 3 (EPS vs sales)

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

Balance Sheet as on March 31<sup>st</sup>

Liabilities	Rs	Assets	Rs
Equity capital (Rs. 10 per share)		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>Total Liabilities</b>	<b>19,00,000</b>	<b>Total Assets</b>	<b>19,00,000</b>

Income Statement for the year ending March 31<sup>st</sup>:

Particulars	Rs
Sales	3,40,000
Operating expenses (including 60,000 depreciation)	1,20,000
EBIT	2,20,000
Less: Interest	60,000
Earnings before tax (EBT)	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,

what will be the **earnings per share** at the new sales level?

### Illustration 4 (EPS,OL,FL,CL)

A Company had the following Balance Sheet as on 31<sup>st</sup> March 2014:

Liabilities	(Rs in Crores)	Assets	(Rs in crores)
Equity Share Capital (50 lakh shares of Rs 10 each)	5	Fixed Assets (Net)	12.5
Reserves and Surplus	1	Current Assets	7.5
15% Debentures	10		
Current Liabilities	4		
	<b>20</b>		<b>20</b>

The additional information is given as under:

Fixed cost per annum (excluding interest)	4 crores
Variable operating cost ratio	65%
Total assets turnover ratio	2.5

Income Tax rate	30%
-----------------	-----

Calculate the following and comment:

- i. Earnings per share
- ii. Operating Leverage
- iii. Financial Leverage
- iv. Combined Leverage

### Illustration 5 (OL,FL,CL)

The following information related to XL Company Ltd. for the year ended 31st March 2013 are available to you:

Equity share capital of Rs.10 each	Rs.25 lakh
11% Bonds of Rs.1000 each	Rs.18.5 lakh
Sales	Rs.42 lakh
Fixed cost (Excluding Interest)	Rs.3.48 lakh
Financial leverage	1.39
Profit-Volume Ratio	25.55%
Income Tax Rate Applicable	35%

You are required to calculate: (i) Operating Leverage; (ii) Combined Leverage; and (iii) Earning per Share.

### Illustration 6 (OL,FL,CL)

Calculate the operating leverage, financial leverage and combined leverage from the following data under Situation I and II and Financial Plan A and B":

Installed Capacity	4,000 units
Actual Production and Sales	75% of the Capacity
Selling Price	Rs 30 per unit
Variable Cost	Rs 15 per unit

Fixed Cost:

Under Situation – I	Rs 15,000
Under Situation – II	Rs 20,000

Capital Structure:

	Plan A	Plan B
	(Rs)	(Rs)
Equity	10,000	15,000
Debt (Rate of Interest at 20%)	10,000	5,000
	<b>20,000</b>	<b>20,000</b>

### Illustration 7 ( Degree of operating leverage)

X Ltd has estimated that for a new product its break-even point is 20,000 units if the item is sold for Rs. 14 per unit and variable cost is Rs. 9 per unit. Calculate the degree of operating leverage for sales volume is 25,000 units and 30,000 units.

### Illustration 8 (OL,FL,CL)

Z Limited is considering the installation of a new project costing Rs. 80,00,000. Expected Annual Sales from the project is Rs. 90,00,000. Variable costs are 60% of sales.

Expected annual fixed cost other than interest is Rs. 10,00,000. Corporate tax rate is 30%. Company wants to arrange the funds through issuing 4,00,000 equity shares of Rs. 10 each and 12% debentures of Rs. 40,00,000.

You are required to:

- Calculate the operating, financial and combined leverages and Earnings per Share (EPS).
- Determine the likely level of EBIT, if EPS is (i) Rs. 4, (ii) Rs. 2, (iii) Rs. 0

### Illustration 9 (Change in EPS)

Consider the following information for Strong Ltd.

	Rs. in lakh
EBIT	1,120
PBT	320
Fixed Cost	700

Calculate % change in earnings per share, if sales increase by 5%.

### Illustration 10 ( Earnings calculation)

A company operates at a production level of 1,000 units. The contribution is `60 per unit, operating leverage is 6, combined leverage is 24. If tax rate is 30%, what would be its earnings after tax?

### Illustration 11 (Income statement)

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

### Illustration 12 (FL,EPS)

The following details of RST Limited for the year ended 31st March 2006 are given below:

Operating leverage	1.4
Combined leverage	2.8
Fixed Cost (Excluding interest)	Rs.2.04 lakhs
Sales	Rs. 30.00 lakhs



12% Debentures of Rs. 100 each	Rs. 21.25 lakhs
Equity Share Capital of Rs. 10 each	Rs. 17.00 lakhs
Income tax rate	30 percent

Required:

- Calculate Financial leverage
- Calculate P/V ratio and Earning per Share (EPS)
- If the company belongs to an industry, whose assets turnover is 1.5, does it have a high or low assets leverage?

At what level of sales, the Earning before Tax (EBT) of the company will be equal to Zero?

### Illustration 13 (FL, Cover for dividend, PE, net fund flow)

The capital structure of JCPL Ltd. is as follows:

Particulars	Rs.
Equity Share Capital of Rs. 10 each	8,00,000
8% Preference Share Capital of Rs. 10 each	6,25,000
10% Debentures of Rs. 100 each	<u>4,00,000</u>
	18,25,000

#### Additional Information:

- Profit after tax (Tax Rate 30%) is Rs. 1,82,000
- Operating Expenses (including depreciation Rs. 90,000) being 1.5 times of EBIT
- Equity Share dividend paid 15%
- Market Price per Equity Share Rs.20

#### Required to calculate:

- Operating and Financial Leverage
- Cover for the preference and equity share of dividends
- The earning yield and price earnings ratio
- The net fund flow

### Illustration 14 (Q2 Nov 2018)

Following is the Balance Sheet of Soni Ltd. as on 31st March, 2018 :

Liabilities	Amount in Rs.
Shareholder's Funds :	
Equity Share Capital (Rs.10 each)	25,00,000
Reserves and Surplus	5,00,000
Non-Current Liabilities (12% Debentures)	50,00,000
Current Liabilities	20,00,000
Total	1,00,00,000
Assets	Amount in Rs.
Non-current Assets	60,00,000
Current Assets	40,00,000
Total	1,00,00,000

Additional Information:

- (i) Variable Cost is 60% of Sales.
- (ii) Fixed Cost p.a. excluding interest ` 20,00,000.
- (iii) Total Asset Turnover Ratio is 5 times.
- (iv) Income Tax Rate 25%

You are required to:

- (1) Prepare Income Statement
- (2) Calculate the following and comment:
  - (a) Operating Leverage
  - (b) Financial Leverage
  - (c) Combined Leverage

### Illustration 15 (Q4 RTP Nov 2020)

The capital structure of PS Ltd. for the year ended 31st March, 2020 consisted as follows:

Particulars	Amount in Rs.
Equity share capital (face value Rs. 100 each)	10,00,000
10% debentures (Rs. 100 each)	10,00,000

During the year 2019-20, sales decreased to 1,00,000 units as compared to 1,20,000 units in the previous year. However, the selling price stood at Rs. 12 per unit and variable cost at Rs. 8 per unit for both the years. The fixed expenses were at Rs. 2,00,000 p.a. and the income tax rate is 30%.

You are required to calculate the following:

- (a) The degree of financial leverage at 1,20,000 units and 1,00,000 units.
- (b) The degree of operating leverage at 1,20,000 units and 1,00,000 units.
- (c) The percentage change in EPS.

### Illustration 16 (Q2 Nov 2019)

The Balance Sheet of Gitashree Ltd. is given below:

	Liabilities	(Rs. )	(Rs. )
	Shareholders' fund		
	Equity share capital of Rs. 10 each	1,80,000	
	Retained earnings	60,000	2,40,000
	Non-current liabilities 10% debt		2,40,000
	Current liabilities		1,20,000
			6,00,000
	Assets		
	Fixed Assets		4,50,000
	Current Assets		1,50,000
			6,00,000

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The company's total asset turnover ratio is 4.

Its fixed operating cost is Rs. 2,00,000 and its variable operating cost ratio is 60%.

The income tax rate is 30%.

Calculate:

- (i) (a) Degree of Operating leverage.  
(b) Degree of Financial leverage.  
(c) Degree of Combined leverage.
- (ii) Find out EBIT if EPS is (a) Rs. 1 (b) Rs. 2 and (c) Rs. 0.

### Illustration 17 (Q1(b) May 2018)

The following data have been extracted from the books of LM Ltd:

Sales	Rs. 100 lakhs
Interest Payable per annum	Rs. 10 lakhs
Operating leverage	1.2
Combined leverage	2.16

You are required to calculate:

- (i) The financial leverage,
- (ii) Fixed cost and
- (iii) P/V ratio

### Illustration 18 (Q4 RTP May 2018-New)

#### Question 4: (Leverage)

Calculate the operating leverage, financial leverage and combined leverage from the following data under Situation I and II and Financial Plan A and B:

Installed Capacity	4,000 units
Actual Production and Sales	75% of the Capacity
Selling Price	₹ 30 per unit
Variable Cost	₹ 15 per unit

Fixed Cost:

Under Situation I	₹ 15,000
Under Situation II	₹ 20,000

Capital Structure:

	Financial Plan	
	A (₹)	B (₹)
Equity	10,000	15,000
Debt (Rate of Interest at 20%)	10,000	5,000
	20,000	20,000

### Illustration 19 (Q4 RTP Nov 2018-New)

A firm has sales of ₹ 75,00,000 variable cost is 56% and fixed cost is ₹ 6,00,000.

It has a debt of ₹ 45,00,000 at 9% and equity of ₹ 55,00,000. You are required to INTERPRET:

- (i) The firm's ROI?
- (ii) Does it have favourable financial leverage?
- (iii) If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover?
- (iv) The operating, financial and combined leverages of the firm?
- (v) If the sales is increased by 10% by what percentage EBIT will increase?
- (vi) At what level of sales the EBT of the firm will be equal to zero?
- (vii) If EBIT increases by 20%, by what percentage EBT will increase?

#### Illustration 20 (Q4 May 2019)

The capital structure of the Shiva Ltd. consists of;  
Equity share capital of Rs. 20,00,000 (Share of Rs.100 per value)

Rs. 20,00,000 of 10% Debentures

Sales increased by 20% from 2,00,000 units to 2,40,000 units

Selling price	Rs. 10 per unit
Variable costs	Rs. 6 per unit
Fixed expenses	Rs. 4,00,000

The income tax rate is assumed to be 50%.

a. You are required to calculate the following:

- I. The percentage increase in earnings per share;
- II. Financial leverage at 2,00,000 units and 2,40,000 units.
- III. Operating leverage at 2,00,000 units and 2,40,000 units.

b. Comment on the behaviour of operating and Financial leverages in relation to increase in production from 2,00,000 units to 2,40,000 units.

#### Illustration 21 (Q4 RTP Nov 2019-New)

The following summarises the percentage changes in operating income, percentage changes in revenues, and betas for four listed firms.

Firm	Change in revenue	Change in operating income	Beta
A Ltd.	35%	22%	1.00
B Ltd.	24%	35%	1.65
C Ltd.	29%	26%	1.15
D Ltd.	32%	30%	1.20

Required:

- (i) Calculate the degree of operating leverage for each of these firms. Comment also.
- (ii) Use the operating leverage to explain why these firms have different beta.

#### Illustration 22 (May 2018, Old)

Following are the selected financial information of A Ltd. and B Ltd. for the year ended March 31, 2018:

	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

### Illustration -23

The following information is related to Yizi company limited for the year ended 31<sup>st</sup> March 2021

Equity Share Capital (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

- (i) Operating Leverage
- (ii) Combined Leverage
- (iii) Earnings per share

### Illustration - 24

Following are the selected financial year information of A Ltd. And B Ltd. For the year ended 31st March 2021

	A Ltd.	B. Ltd
Variable Cost Ratio	60%	50%
Interest	₹ 20,000	₹ 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.

### Illustration -25

The following particulars relating to Navya Ltd. for the year ended 31st March 2021 is given:

Output	1,00,000 units at normal capacity
Selling price per unit	₹ 40
Variable cost per unit	₹ 20
Fixed cost	₹ 10,00,000

The capital structure of the company as on 31st March, 2021 is as follows

Particulars	Rs.
Equity share capital (1,00,000 shares of ₹ 10 each)	10,00,000
Reserves and surplus	5,00,000
7% debentures	10,00,000
Current liabilities	5,00,000
Total	30,00,000

Navya Ltd. has decided to undertake an expansion project to use the market potential, that will involve ₹ 10 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by ₹ 5,00,000 and variable cost per unit will be decreased by 10%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion programme are planned:

1. Entirely by equity shares of ₹ 10 each at par.
2. ₹ 5 lakh by issue of equity shares of ₹ 10 each and the balance by issue of 6% debentures of ₹ 100 each at par.
3. Entirely by 6% debentures of ₹ 100 each at par

FIND out which of the above-mentioned alternatives would you recommend for Navya Ltd. with reference to the risk and return involved, assuming a corporate tax of 40%.

#### Illustration - 26

You are given the following information of 5 firms of the same industry

Name of the Firm	Change in Revenue	Change in Operating Income	Change in Earning per share
M	28%	26%	32%
N	27%	34%	26%
P	25%	38%	23%
Q	23%	43%	27%
R	25%	40%	28%

You are required to CALCULATE for all firms:

1. Degree of operating leverage and
2. Degree of Combined leverage.

#### Illustration 27 (RTP May 22)

Company P and Q are having same earnings before tax. However, the margin of safety of Company P is 0.20 and, for Company Q, is 1.25 times than that of Company P. The interest expense of Company P is Rs. 1,50,000 and, for Company Q, is 1/3rd less than that of Company P. Further, the financial leverage of Company P is 4 and, for Company Q, is 75% of Company P. Other information is given as below:

Particulars	Company P	Company Q
Profit Volume Ratio	25%	33.33%
Tax rate	45%	45%

You are required to PREPARE Income Statement for both the companies

# CHAPTER 7

## INVESTMENT DECISIONS

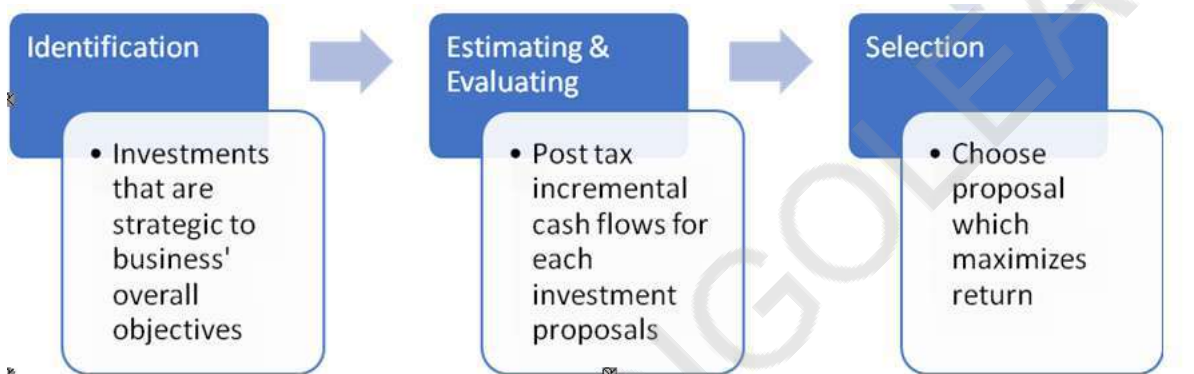
### 1 Introduction

Investment decision concerned with optimum utilisation of fund to maximize the wealth of the organisation. Investment decisions also known as Capital budgeting.

Capital Budgeting is the process of evaluating investments and huge expenditure in order to obtain the best returns on Investment.

E.g. Construction of New plant or big investments in an outside venture is examples of Capital Budgeting

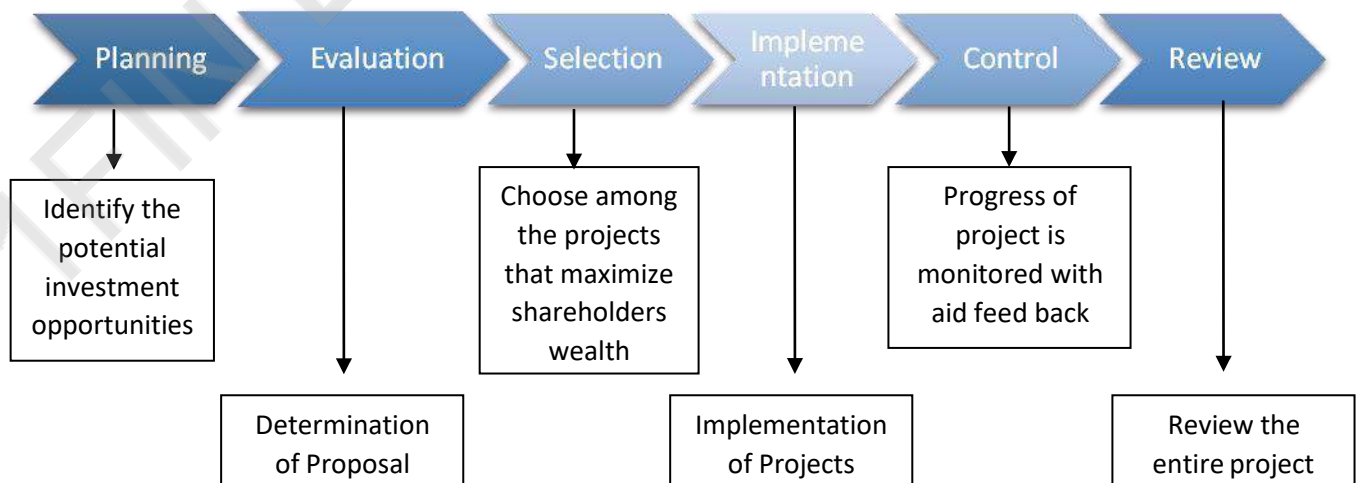
**Capital Budgeting involves-**



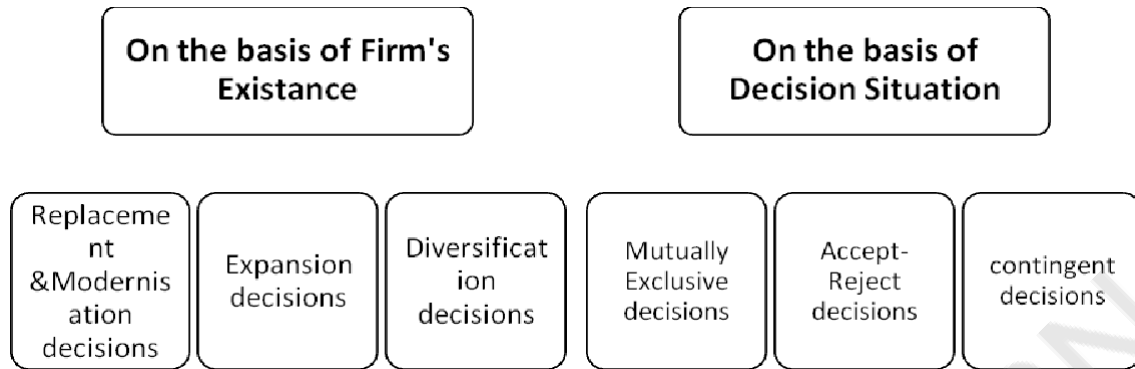
### Purpose of Capital Budgeting

- Substantial Expenditure
- Long term period
- Irreversibility
- Complex Decisions

### Process of Capital Budgeting



## 2 Types of Investment Decisions



**Replacement & Modernisation decisions-** It aims to improve operating efficiency and reduce cost. This method widely used in Replacement of Plant & machinery because it has become technologically out-dated. They are also called as Cost reduction decisions

**Expansion decisions-** These decisions are helpful to existing successful firms which experience growth in demand of their product line.

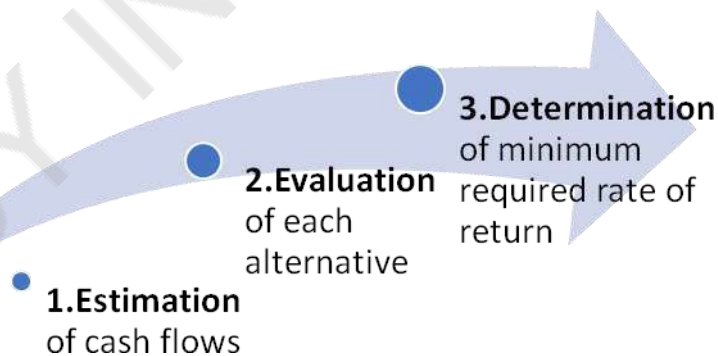
**Diversification decisions-** It requires in evaluating proposals to diversify into new product lines or markets etc.

**Mutually exclusive decisions-** Two or more alternative proposals are there, if Acceptance of one proposal will exclude the acceptance of other alternative proposals. These are said to be mutually exclusive.

**Accept-Reject decisions-** In these decisions, proposals are independent and don't compete with each other. The firm may accept or reject a proposal on the basis of a higher return on the required investment.

**Contingent decisions-** When the proposals are dependable, they are contingent decisions. Investment in one proposal requires investment in one or more other proposals. E.g. If company accepts a proposal to invest in infrastructure facilities.

### Steps of Capital Budgeting Procedure





### 3 Estimation of Project cash flows

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Generally Project cash flows consists of Cash outflows & Cash inflows. Cashoutflows denote Cost and Cash inflows denotes Benefits.

Considering items for calculation of Cash flows:-

#### 1. Depreciation

It is a non-cash item which doesn't affect the cash flow. But we should consider it for tax shield. This benefit reduces cash outflow for taxes. Thus it considered as cash inflow

**E.g.** If the profit of the organisation is 5 Lacs before depreciation and depreciation is 2 Lacs and the applicable tax rate is 20%. So, the depreciation tax shield will be  $2 \text{ lacs} \times 20\% = \text{Rs.}40,000$

#### 2. Opportunity cost

It means next best alternative forgone due to choosing an alternative investment option.

**E.g.** If you would have invested money in Stocks, and after a year, 50,000 would become 60,000. On the other hand, if you keep this money idle instead of investing in cash, then your opportunity cost will be the difference between 60000 and 50000, i.e., Rs. 10,000

#### 3. Sunk Cost

It's a cash outlay that has already been incurred in the past and can't be reversed in present

**E.g.** Sum of 1 lacs paid for advisory fees for evaluating project appraisal. Then such fee paid is irrelevant and isn't considered for estimating cashflows.

#### 4. Working capital

Every big project requires working capital because for every business, investment in working capital is must.

Initial working capital requirement

- CASH OUTFLOW

At the end of the project its release

- CASH INFLOW

Additional working capital

- CASH OUTFLOW

during Project

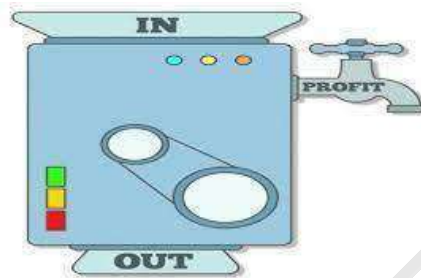
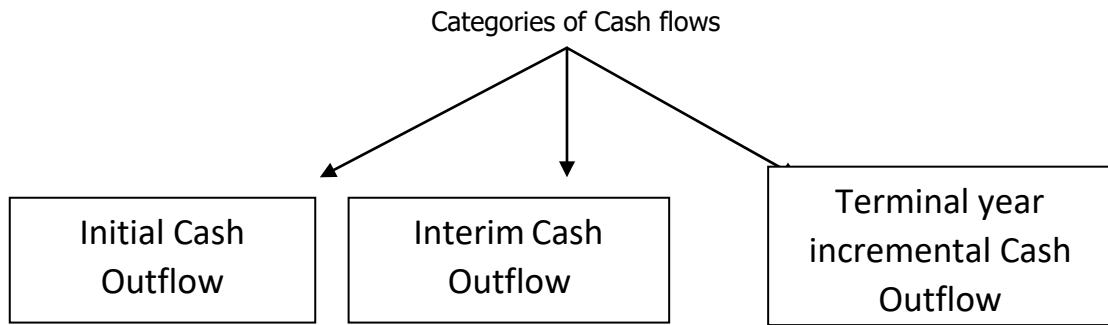
Release of project not mentioned assume full amount to be realized

#### 5. Allocated Overheads

Overheads are charged on the basis of some rational basis.

#### 6. Additional capital Investment

Capital investment shall not require in the beginning of the project. It can require during the continuance of the project. In such cases, it treated as Cash Outflows.



### 3.1 Calculation of Initial cash flows

#### Fresh Proposal

	Cost of New Asset	XXX
(+)	Installation/Set up cost	XXX
(+)	Investment in working capital	<u>XXX</u>
	<b>Initial Cash Outflow</b>	<b>XXX</b>

#### Replacement Decision

(-)	Net proceeds from Sale of old assets (XXX)	
(+)/(-)	Tax expense (Saving/Loss) due to Sale of Old asset	<u>XXX</u>
	<b>Initial Cash Outflow</b>	<b>XXX</b>

### 3.2 Calculation of Interim cash flows

Profit after Tax	XXX
(+) Non-Cash Expenses (E.g. Depreciation)	XXX
(+)/(-) Net Decrease (Increase) in working capital	<u>XXX</u>
<b>Interim Net Cash flow for the period</b>	<b>XXX</b>
Net increase (Decrease) in Operating Revenue	XXX
(+)/ (-) Net Decrease (Increase) in operating expenses	<u>XXX</u>
Net changes in income before taxes	XXX
(+)/ (-) Net Decrease (Increase) in Taxes	<u>XXX</u>
Net changes in income after taxes	XXX
(+)/ (-) Net Decrease (Increase) in depreciation charges	<u>XXX</u>
<b>Incremental net cash flow for the period</b>	<b>XXX</b>

### 3.3 Calculation of Terminal Year Incremental cash flows

Final Salvage Value (Disposal costs) of asset	XXX
(+) Interim Cash Flow	XXX
(+)/(-) Tax Savings (Tax expenses) due to sale or disposal of asset (Including depreciation)	XXX
(+) Release of Net working Capital	<u>XXX</u> <u>XXX</u>
<b>Terminal Year incremental net cash flow</b>	<b>XXX</b>

## 4 Basic Principle of measuring project cash flow

'Block of Assets' concept to be used for treatment of depreciation, which means group of assets falling within a particular class of assets

Normal treatment for depreciation

Purchase Price of Asset	XXX
(-) Depreciation for the years	XXX
<b>WDV @ end</b>	<b>XXX</b>

**Case 1:** No other asset in the block

WDV @ end	XXX
(-) Sale value of asset	XXX
Short term capital loss (STCL)	XXX
<b>Tax Benefit on STCL @30%</b>	<b>XXX</b>

**Case 2:** More than one asset exists in the block

WDV @ end	XXX
(-) Sale value of asset	XXX
WDV	XXX
Depreciation	XXX
<b>Tax Benefit on DEP @ 30%</b>	<b>XXX</b>

**Case 3:** Sale value more than WDV

Sale value	XXX
(-) WDV of asset	XXX
Short term Capital gain (STCG)	XXX
<b>Tax loss on Gain @ 30%</b>	<b>XXX</b>

### Exclusions of finance costs Principle

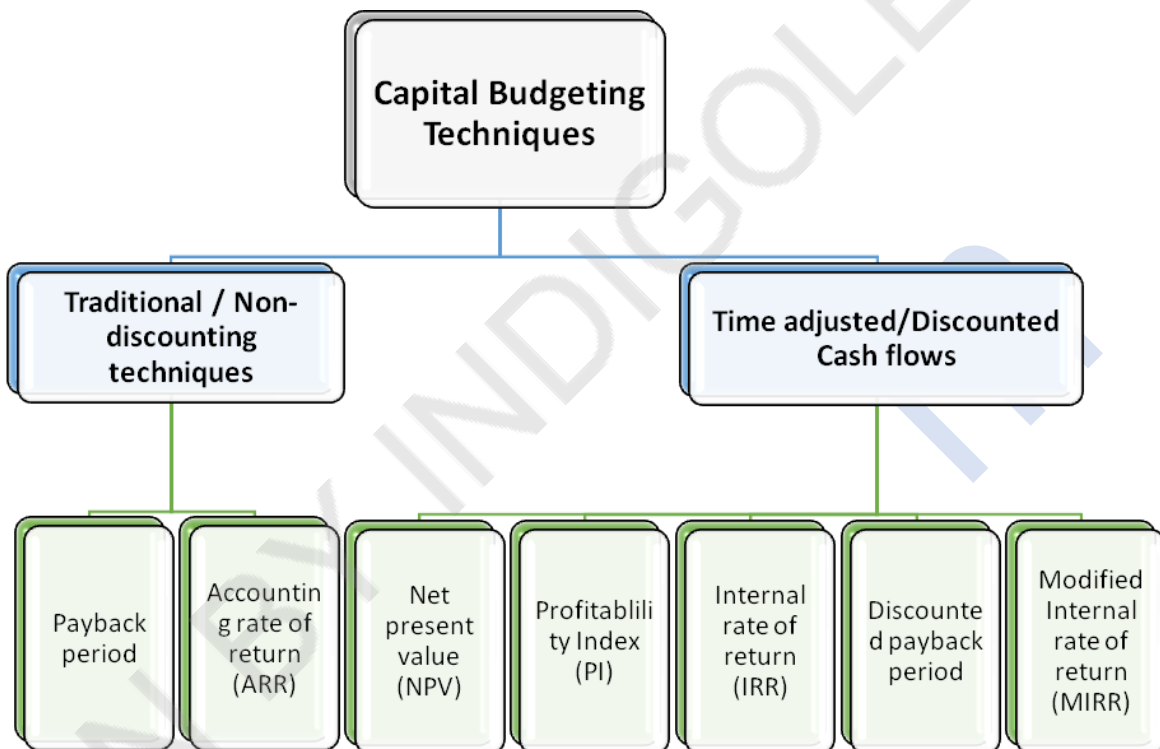
- Interest on Long term debt is ignored
- Expected dividends are deemed as irrelevant in cash flow analysis

### Post Tax principle

Cash flow to be defined in post-tax principle. It means Tax payment to be properly deducted in deriving cash flows.

Sales	XXX
(-) Variable cost	XXX
Contribution	XXX
(-) Fixed cost	XXX
Earnings before tax	XXX
(-) Tax	XXX
Earnings after tax	XXX
(+) Depreciation	XXX
<b>Cash inflow after Tax</b>	<b>XXX</b>

## 5 Capital budgeting and its Techniques



### 5.1 Traditional or Non-discounting techniques

These techniques don't discount the future cash flows. There are two techniques of traditional techniques such as Payback period and Accounting rate of return.

#### 5.1.1 Payback Period

$$\text{Payback Period} = \frac{\text{Total initial capital investment}}{\text{Annual expected after-tax net cash flow}}$$

Time required to recover the initial cash outflow is called Payback period. It's the length of the time required for the cumulative total net cash flows from the investment = Total initial cash outlays

### Advantages

- ✓ Easy to compute
- ✓ Provide quick estimate
- ✓ Payback period serves as an estimate of a project's risk

### Disadvantages

- It ignores the time value of money
- It ignores cash flows after the payback period
- Ignoring Long term project

#### 5.1.1.1 Payback Reciprocal

A major drawback in Payback period is that it doesn't indicate any cut-off period for the purpose of investment decision. For that reciprocal of the payback would be close approximation of IRR if the life of project is at least twice of payback period and the project generates equal amount of the annual cash inflows.

$$\text{Payback reciprocal} = \frac{\text{Average annual cash inflow}}{\text{Initial Investment}}$$

#### 5.1.2

#### Accounting (Book) Rate of Return or Average Rate of return (ARR)

It measures the average annual net income of the project (increment income) as a percentage of the investment.

$$\text{Accounting rate of return} = \frac{\text{Average annual net income}}{\text{Investment}}$$

**Average annual income** generated by the project over its useful life

**Investment** is initial investment (Including installation cost) or the average investment over the useful life of the project or average investment

**Average investment** -> Average amount of fund remained blocked during project lifetime.

### Advantages of ARR

- ✓ Uses readily available data
- ✓ Evaluate performance on the operating results
- ✓ Considers all net incomes over the entire life of the project

### Disadvantages of ARR

- Ignoring the time value of money
- Choice of accounting procedures
- Uses net income rather than cash flows
- Ignores the fact that require commitments of working capital

## 5.2 Discounting Techniques

It considers time value of money and discount the cash flow to their Present value. These techniques are also known as Present value techniques. These are namely Net present value (NPV), Internal Rate of return (IRR) and Profitability Index (PI)

### 5.2.1 Net Present value Technique (NPV)

It is a discounted cash flow method that considers the time value of money in evaluating capital investments. It uses specified discount rate to bring all subsequent cash inflows after the initial investment to their present values.

$$\text{NPV} = \text{Present value of net cash inflow} - \text{Total net initial investment}$$

$$\text{NPV} = \frac{C_1}{(1+k)^1} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \dots + \frac{C_n}{(1+k)^n} - I$$

$$\text{NPV} = \sum_{t=1}^n \frac{C_t}{(1+k)^t} - I$$

Where,

C = Cash flow of various years  
K = Discount rate

N = Life of the project  
I = Investment

#### Steps to calculating NPV

1. Determine the net cash inflow in each year
2. Select the desired rate of return or discounting rate (WACC)
3. Find the discount factor each year based desired ROR selected
4. Determines the present values of the net cash flows by multiplying the cash flows by respective discount factors of respective period called Present value
5. Total amt of all PVs of cash flows

#### Decision Rule

NPV  $\geq$  0 – Accept the proposal

NPV  $\leq$  0 – Reject the proposal



NPV method can be used to select between mutually exclusive projects; the one with the higher NPV should be selected

### Advantages

- ✓ Time value of money
- ✓ Cash flows is considered
- ✓ Addition to the wealth of Shareholders.
- ✓ Discounted cash flows

### Disadvantages

- Difficult calculations
- Accuracy of NPV depends on accurate estimation
- Ignores the difference in initial outflows

### 5.2.2 Profitability Index

It is known as the 'Desirability factor' or 'Profitability index' or 'Present value Index Method'.

#### Advantages

#### Disadvantages

$$\text{PI} = \frac{\text{Sum of discounted cash inflows}}{\text{Initial cash outlay or total discounted cash outflow}}$$

(As the case may)

- ✓ Concept of time value of money
- ✓ Relative measure of a project's profitability
- Fails as a guide
- Single project is excluded
- Cannot be used indiscriminately

In case of mutually exclusive projects, Project with higher PI should be selected

#### Decision Rule

$\text{PI} \geq$  Accept the proposal

$\text{PI} \leq$  Reject the proposal

### 5.2.3 Internal Rate of return (IRR)

IRR considers the time value of money, the initial cash investment, and all cash flows from the investment. But unlike NPV method, IRR method doesn't use the desired rate of return but estimates the discount rate that makes PV of subsequent cash inflows = Initial investment. This discount rate is called IRR.



IRR (Discount rate) = Present value of the expected cash inflows with initial cash outflow

$$\text{IRR} = \text{LR} + \frac{\text{NPV at LR}}{\text{NPV at LR} - \text{NPV at HR}} \times (\text{HR} - \text{LR})$$

**Or**

$$\text{LR} + \frac{\text{PV at LR} - \text{CI}}{\text{PV at LR} - \text{PV at HR}} \times (\text{HR} - \text{LR})$$

Where,

LR= Lower rate HR Higher rate

CI= Capital Investment



IRR ≥ WACC- Accept the proposal  
IRR < WACC- Reject the proposal

### **Calculation of IRR**

**Step 1:** Total initial investment = Annual cash inflow x Annuity discount factor of the discount rate for the number of periods of the investment's useful life

$$\text{A} = \frac{\text{Total initial cash disbursements \& commitment for the investment}}{\text{Annual (equal) cash inflows from the investment}}$$

A=Annuity discount factor

**Step 2:** A calculated, the interest rate corresponding to project's life, the value of A is searched in Present value annuity factor Table. Exact value of A is found the respective interest rate shall be IRR

**Step 3:** Compute approximate payback period also called fake period

**Step 4:** Locate this value in PVAF table

**Step 5:** Discount cash flow these two discounting rates

**Step 6:** Use interpolation formula

#### **Advantages**

- ✓ Considers time value of money
- ✓ All cash flows are considered
- ✓ IRR is easier to use
- ✓ Helps in achieving objective

#### **Disadvantages**

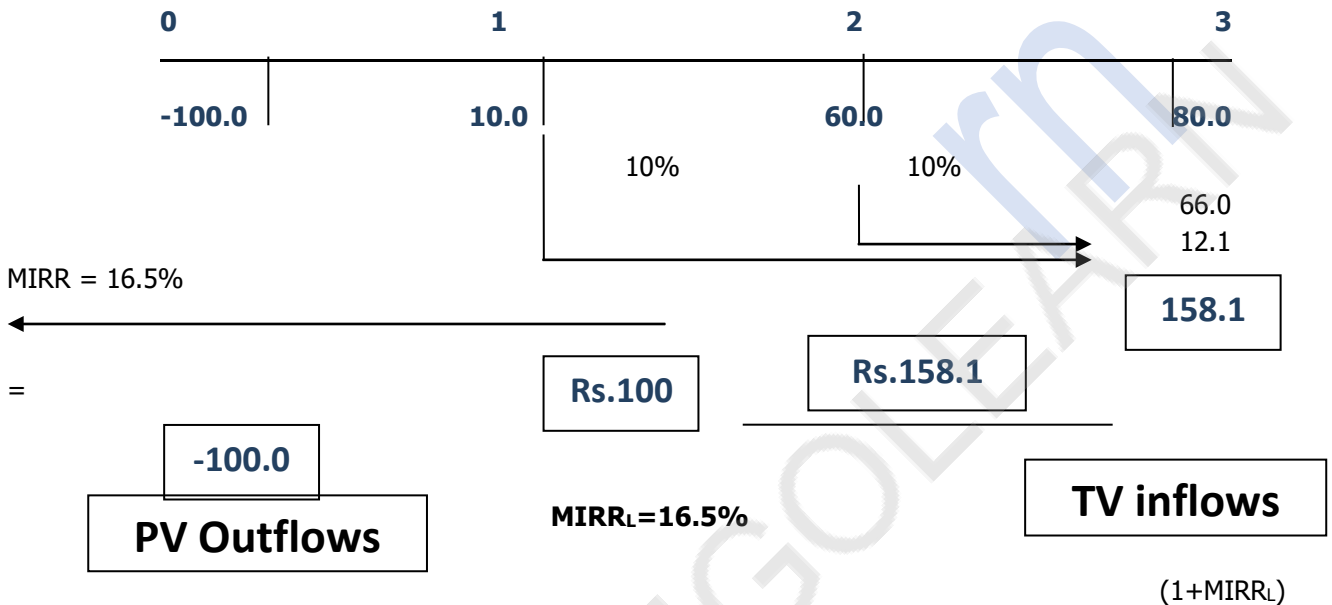
- Process is tedious
- Creates a peculiar situation
- Ignores firm's ability to re-invest
- Decisions based only on IRR criterion, it may not be correct

### 5.2.4 Modified IRR

It is the discount rate that causes the PV of a project's terminal value(TV) to equal the PV of costs. TV is found by compounding inflows at WACC

MIRR assumes cash flows are reinvested at the WACC

$$\sum_{t=0}^N \frac{COE_t}{(1+r)^t} = \frac{\sum_{t=0}^N CIF_t(1+r)^{N-t}}{(1+MIRR)^N}$$



3

### Reinvestment rate assumptions

- NPV method assumes CFs are reinvested at the WACC
- IRR method assumes CFs are reinvested at IRR
- Assuming CFs is reinvested @ opportunity cost of capital is more realistic, so NPV method is the best. NPV method should be used to choose between mutually exclusive projects.
- Perhaps a hybrid of the IRR that assumes cost of capital reinvestment is needed.

### 5.2.5 Discounted Payback Period Method

It is similar to Payback period as discussed under the non- discounting method expect the cash flows are discounted at predetermined rate and the payback period so calculated is called 'Discounted Payback period'. It is the time required for cumulative cash flows to recover the cash outflows of the projects. This is considered superior to simple payback period method because it takes into account time value of money.

<b>Discounted payback period</b>	=	Year before the discounted payback period occurs	+	Cumulative Cash flow in <u>year before recovery</u> Discounted cash flow in Year after Recovery
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### Similarities of NPV & IRR Methods

- Both NPV & IRR are discounted cash flow methods which considers time value of money

- Both the techniques consider all cash flows over the expected useful life of the investment

### Differences of NPV & IRR Methods

Basis of differences	NPV	IRR
<b>Meaning</b>	The total of all the present values of cash flows (Both positive & negative) of the project is known as NPV	The rate at which the sum of discounted cash inflows equates discounted cash outflows.
<b>Size disparity</b>	Absolute measure in terms	Relative measure in percentage
<b>Time Disparity in cash flows</b>	Will not affect NPV	Will show negative or multiple IRR
<b>Represents</b>	Surplus from the project	Point of no Profit no loss (Break even point)
<b>Disclosed by</b>	Difference in net operating income and net cash flows.	Difference in the return of equity shareholders.

### 5.3 Special Cases

#### 5.3.1 Capital budgeting under capital rationing

If NPV positive, it should be accepted with an objective of maximisation of wealth of shareholders. But, there may be a situation due to resource, constraints, A firm may have to select some projects among various projects, all having positive NPVs. Broadly two scenarios may influence the method of evaluation to be adopted.

- Projects are independent of each other and are divisible in nature**- NPV rule should be modified and ranked on basis of NPV per rupee of capital method

- Projects are not divisible**- Here projects are ranked on the basis of Absolute NPV basis

#### 5.3.2 Projects with unequal lives

Firm may be faced with any of the following problems:

- Retaining an old asset or replace it with new one
- Choosing one proposal among two proposals (Mutually exclusive)

Although, while evaluating the proposals in the above scenarios, do not pose any special problem if they have same life period. In such situation, any of the following methods to be used

- Replacement Chain method
- Equivalent annualized criterion

These methods can be understood with the help of following illustration:

#### Replacement chain Method

Year	0	1	2	3
<b>Project S</b>	(1000)	700	700	-
<b>Project L</b>	(1000)	500	500	500

As per Traditional analysis;

$NPV_S => Rs.215$

$NPV_L => Rs.243$

- Is project L better?

Need replacement chain /Equivalent annuity criterion

- Use the replacement chain to calculate extended NPVs to a common life.
- Since Project S has 2-year life and L has a 3-Year life, the common life is 6 years

Year	0	1	2	3	4	5	6
------	---	---	---	---	---	---	---

<b>Project S</b>	(1000)	700	700	700	700	700	700
			(1000)		(1000)		
<b>Project L</b>	(1000)	500	500	500	500	500	500
				(1000)			

**NPV<sub>s</sub>=Rs.539.5**

**NPV<sub>L</sub>=Rs.425.6**

In this method, as comparing S & L, S yields better than L

**Equivalent Annualized criterion Method**

Using the previously solved project NPV<sub>s</sub>, the EAA is the annual payment that the project would provide if it were an annuity (annualized NPV)

$$EAA = \frac{NPV (n)}{PVIFA (r, n)}$$

**Project S**

$$EAA_s = 215/1.7355$$

Rs.123.8

**Project L**

$$EAA_L = 243/2.489 = Rs.97.7$$

In this method, as comparing S & L, S yields better than L

## INVESTMENT DECISIONS ILLUSTRATIONS

### Illustration-1 (Relevant cash flows)

ABC Limited is evaluating the purchase of a new project with

- a depreciable base of Rs 1,00,000;
- expected economic life of 4 years and
- change in earnings before taxes and depreciation of
  - o Rs 45,000 in year 1,
  - o Rs 30,000 in year 2,
  - o Rs 25,000 in year 3, and
  - o Rs 35,000 in year 4.

Assume straight-line depreciation and a 20% tax rate. You are required to compute the relevant cash flows.

### Illustration-2 (Payback period)

Suppose a project costs Rs. 20,00,000 and yields annually a profit of Rs. 3,00,000 after depreciation @ 12½% (straight line method) but before tax @50%,  
Compute the Payback Period.

### Illustration-3 (Payback period-uneven cash flows)

Suppose XYZ Ltd. is analyzing a project requiring an initial cash outlay of 2,00,000 and expected to generate cash inflows as follows:

Year	Annual cash Inflows
1	80,000
2	60,000
3	60,000
4	20,000

- i. Find out Payback period.
- ii. Suppose in above case, if the initial outlay had been Rs.2,05,000 ,what would be payback period?

### Illustration-4 (ARR)

Suppose Times Ltd. is going to invest in a project a sum of 3,00,000 having a life span of 3 years. Salvage value of machine is 90,000. The profit before depreciation for each year is 1,50,000.

Compute Average ARR based on:

1. Annual basis,
2. Initial Investment,
3. Average Investment.

### Illustration-5 (ARR)

A project requiring an investment of Rs.10,00,000 and it yields profit after tax and depreciation which is as follows:

Years	Profit after tax and depreciation
1	50,000
2	75,000
3	1,25,000
4	1,30,000
5	80,000

<b>Total</b>	4,60,000
--------------	----------

Suppose further that at the end of the 5th year, the plant and machinery of the project can be sold for Rs. 80,000.

Determine Average Rate of Return.

### Illustration-6 (NPV)

Compute the Net present value for a project with a net investment of Rs.1,00,000 and net cash flows year one is Rs. 55,000; for year two is Rs. 80,000 and for year three is Rs.15,000. Further, the company's cost of capital is 10%.

### Illustration-7 (NPV Different projects)

ABC Ltd is a small company that is currently analyzing capital expenditure proposals for the purchase of equipment; the company uses the net present value technique to evaluate projects. The capital budget is limited to Rs.500,000 which ABC Ltd believes is the maximum capital it can raise.

The initial investment and projected net cash flows for each project are shown below. The cost of capital of ABC Ltd is 12%.

You are required to compute the NPV of the different projects.

	<b>Project A</b>	<b>Project B</b>	<b>Project C</b>	<b>Project D</b>
<b>Initial Investment</b>	200,000	190,000	250,000	210,000
<b>Project Cash Inflows</b>				
<b>Year 1</b>	50,000	40,000	75,000	75,000
<b>2</b>	50,000	50,000	75,000	75,000
<b>3</b>	50,000	70,000	60,000	60,000
<b>4</b>	50,000	75,000	80,000	40,000
<b>5</b>	50,000	75,000	100,000	20,000

### Illustration – 8 (Project evaluation using NPV)

Cello Limited is considering buying a new machine which would have a useful economic life of five years, a cost of Rs. 1,25,000 and a scrap value of Rs. 30,000, with 80% of the cost being payable at the start of the project and 20% at the end of the first year.

The machine would produce 50,000 units per annum of a new project with an estimated selling price of Rs. 3 per unit. Direct costs would be Rs. 1.75 per unit and annual fixed costs, including depreciation calculated on a straight- line basis, would be Rs. 40,000 per annum.

In the first year and the second year, special sales promotion expenditure, not included in the above costs, would be incurred, amounting to Rs. 10,000 and Rs. 15,000 respectively.

Evaluate the project using the NPV method of investment appraisal, assuming the company's Cost of capital to be 10%.

### Illustration – 9 (Profitability Index)

Suppose we have three projects involving discounted cash outflow of Rs.5,50,000, Rs.75,000 and Rs.1,00,20,000 respectively. Suppose further that the sum of discounted cash inflows for these projects are Rs.6,50,000, Rs.95,000 and Rs.1,00,30,000 respectively.

Calculate the desirability factors for the three projects.

### Illustration – 10 (NPV & PI)

A hospital is considering purchasing 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 8years.

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? (Tax @30%)

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

### Illustration – 11 (Mutually exclusive projects)

Elite Cooker Company is evaluating three investment situations:

1. produce a new line of aluminium skillets,
2. expand its existing cooker line to include several new sizes, and
3. develop a new, higher-quality line of cookers.

If only the project in question is undertaken, the expected present values and the amounts of investment required are:

Project	Investment Required (Rs)	Present value of Future Cash-Flows (Rs)
1	2,00,000	2,90,000
2	1,15,000	1,85,000
3	2,70,000	4,00,000

- If projects 1 & 2 are jointly undertaken, there will be no economies; the investments required, and present values will simply be the sum of the parts.
- With projects 1 & 3 the economies are possible in investment because one of the machines acquired can be used in both production processes. The total investment for the projects 1 & 3 combined would be Rs.4,40,000.
- If projects 2 & 3 are undertaken, there are economies to be achieved in marketing and producing the products but not in investment. The expected present value of future cash flows for the combination of projects 2 & 3 would be Rs. 6,20,000.
- If all three projects are undertaken simultaneously, the economies noted will still hold good. However, a Rs.1,25,000 extension on the plant will be necessary, as space is not sufficient for all the three projects.

Which project or projects should be chosen?

### Illustration 12 (Mutually exclusive projects)

Shiva Limited is planning its capital investment program for next year. It has five projects all of which give a positive NPV at the company cut-off rate of 15 percent, the investment outflows and present values being as follows

(Rs in '000)

Project	Investment	NPV @15%
A	-50	15.4
B	-40	18.7
C	-25	10.1
D	-30	11.2
E	-35	19.3

The company is limited to a capital spending of Rs.1,20,000.

You are required to optimize the returns from a package of projects within the capital spending limit.

- If the projects are independent of each other and are divisible (i.e., part-project is possible)
- What would be your answer if the projects are indivisible
- Had the projects been Mutually Exclusive, which project would you select?

### Illustration 13 (PBP,ARR,PI)

A Ltd. is considering the purchase of a machine which will perform some operations which are at present performed by workers. Machines X and Y are alternative models.

The following details are available:

(Rs.)

	Machine (X)	Machine (Y)
<b>Cost of Machine</b>	1,50,000	2,40,000
<b>Estimated life of machine</b>	5 years	6 years
<b>Estimated cost of maintenance p.a.</b>	7,000	11,000
<b>Estimated cost of indirect material p.a.</b>	6,000	8,000
<b>Estimated savings in scrap p.a.</b>	10,000	15,000
<b>Estimated cost of supervision p.a.</b>	12,000	16,000
<b>Estimated savings in wages p.a.</b>	90,000	1,20,000

Depreciation will be charged on straight line basis. The tax rate is 30%.

Assuming cost of capital being 10%, evaluate the alternatives according to:

- Pay Back period,
- Average rate of return method and
- Present value index method

(The present value of Rs. 1.00 @ 10% p.a. for 5 years is 3.79 and for 6 years is 4.354)

### Illustration 14 (DPBP,NPV,PI)

PQR Company Ltd. is considering selecting a machine out of two **mutually exclusive** machines. The company's **cost of capital is 12 per cent** and **corporate tax rate is 30 per cent**. Other information relating to both machines is as follows:

Particulars	Machine I	Machine II
<b>Cost of Machine</b>	Rs. 15,00,000	Rs. 20,00,000
<b>Expected life</b>	5 Yrs.	5 Yrs.
<b>Annual Income (before tax and Depreciation)</b>	Rs 6,25,000	Rs. 8,75,000

Depreciation is to be charged on straight line basis: You are required to calculate:

- Discounted Pay Back Period
- Net Present Value
- Profitability Index

Year	1	2	3	4	5
<b>PV factor @ 12%</b>	0.893	0.797	0.712	0.636	0.567



### Illustration 15 (Replacement)

Lockwood Limited wants to replace its old machine with a new automatic machine. Two models A and B are available at the same cost of Rs. 5 lakhs each. Salvage value of the old machine is Rs. 1 lakh. The utilities of the existing machine can be used if the company purchases A. Additional cost of utilities to be purchased in that case are Rs. 1 lakh. If the company purchases B, then all the existing utilities will have to be replaced with new utilities costing Rs. 2 lakhs. The salvage value of the old utilities will be Rs. 0.20 lakhs. The **earnings after taxation** are expected to be:

Year	(cash in-flows of)		
	A Rs.	B Rs.	P.V.F @ 15%
1	1,00,000	2,00,000	0.87
2	1,50,000	2,10,000	0.76
3	1,80,000	1,80,000	0.66
4	2,00,000	1,70,000	0.57
5	1,70,000	40,000	0.50
Salvage Value at the end of Year 5	50,000	60,000	

The targeted return on capital is 15%.

You are required to

- Compute, for the two machines **separately**, net present value, discounted payback period and desirability factor
- Advice which of the machines is to be selected

### Illustration 16 (PBP vs DPBP)

Consider the following **mutually exclusive** projects:

Cash flows (Rs.)					
Projects	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:

- Calculate the payback period for each project.
- If the standard payback period is 2 years, which project will you select? Will your answer differ, if standard payback period is 3 years?
- 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?
- 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%	0.9091	0.8264	0.7513	0.6830

### Illustration 17 (Repair vs Replacement)

A company wants to invest in machinery that would cost Rs.50,000 at beginning of year 1.

It is estimated that the net cash inflows from operations will be Rs. 18,000 per annum for 3 years, if the company opts to service a part of the machine at the end of year 1 at Rs. 10,000. In such a case, the scrap value at the end of year 3 will be Rs. 12,500.

However, if the company decides not to service the part, then it will have to be replaced at the end of year 2 at Rs. 15,400. But in this case, the machine will work for the 4th year also and get operational cash inflow of Rs.18,000 for the 4th year. It will have to be scrapped at the end of year 4 at Rs. 9,000.

Assuming cost of capital at 10% and ignoring taxes, will you recommend the purchase of this machine based on the net present value of its cash flows?

If the supplier gives a discount of Rs.5,000 for purchase, what would be your decision?

(The present value factors at the end of years 0, 1, 2, 3, 4, 5 and 6 are 1, 0.9091, 0.8264, 0.7513, 0.6830, 0.6209 and 0.5644 respectively).

### Illustration 18 (Project evaluation)

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 Rs.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
<b>Expenditure in Rs. lakhs each year</b>	30	15	10	4

- The company is subjected to 50% tax, straight-line method of depreciation (permissible for tax purpose also) and taking 12% as appropriate after-tax cost of capital, should the project be accepted?

### Illustration 19 (IRR)

Calculate the internal rate of return of an investment of Rs.1,36,000 which yields the following cash inflows:

Year	Cash Inflows Rs.
1	30,000
2	40,000
3	60,000

<b>4</b>	30,000
<b>5</b>	20,000

### Illustration 20 (IRR)

A company proposes to install 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%. If the Net Present Value Annuity 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

Calculate the Internal Rate of Return of the proposal.

### Illustration 21 (NPV,IRR,PBP)

Hind lever Company is considering a new product line to supplement its range line. It is anticipated that the new product line will involve cash investments of Rs. 7,00,000 at time 0 and Rs. 10,00,000 in year 1.

After-tax cash inflows of Rs. 2,50,000 are expected in year 2, Rs. 3,00,000 in year 3, Rs. 3,50,000 in year 4 and Rs. 4,00,000 each year thereafter through year 10. Although the product line might be viable after year 10, the company prefers to be conservative and end all calculations at that time. If the required rate of return is 15 per cent,

- What is the NPV of the project? Is it acceptable?
- What would be the case if the required rate of return were 10%?
- What is its internal rate of return?
- What is the project's payback period?

### Illustration 22 (ARR,NPV,IRR)

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:

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:

- Calculate Payback Period and Average Rate of Return (ARR)
- Calculate Net Present Value and Net Present Value Index, if cost of capital is 10%.
- Calculate Internal Rate of Return (IRR).

PVF Table

Year	10%	37%	38%	40%
<b>1</b>	.909	.730	.725	.714
<b>2</b>	.826	.533	.525	.510
<b>3</b>	.751	.389	.381	.364
<b>4</b>	.683	.284	.276	.260
<b>5</b>	.621	.207	.200	.186

### Illustration-23 (Comprehensive)

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:

**Before-tax Cash inflows (Rs. in '000)**

Year	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

- i. Discounted Payback Period,
- ii. Payback Period,
- iii. Net Present Value and
- iv. Internal Rate of Return.

The PV factors at 12%, 14% and 15% are:

Year	1	2	3	4	5
<b>PV factor at 12%</b>	0.8929	0.7972	0.7118	0.6355	0.5674
<b>PV factor at 14%</b>	0.8772	0.7695	0.6750	0.5921	0.5194
<b>PV factor at 15%</b>	0.8696	0.7561	0.6575	0.5718	0.4972

**Illustration-24 (NPV vs IRR)**

Suppose there are two Project A and Project B are under consideration. The cash flows associated with these projects are as follows:

Year	Project A	Project B
<b>0</b>	(1,00,000)	(3,00,000)
<b>1</b>	50,000	1,40,000
<b>2</b>	60,000	1,90,000
<b>3</b>	40,000	1,00,000

Assuming Cost of Capital equal to 10% which project should be accepted as per NPV Method and IRR Method.

**Illustration-25 (NPV vs IRR)**

Suppose ABC Ltd. is considering two Project X and Project Y for investment. The cash flows associated with these projects are as follows:

Year	Project X	Project Y
<b>0</b>	(2,50,000)	(3,00,000)
<b>1</b>	2,00,000	50,000
<b>2</b>	1,00,000	1,00,000
<b>3</b>	50,000	3,00,000

Assuming Cost of Capital be 10%, which project should be accepted as per NPV Method and IRR Method.

**Illustration-26 (NPV vs IRR)**

Suppose MVA Ltd. is considering two Project A and Project B for investment. The cash flows associated with these projects are as follows:

Year	Project A (In Rs.)	Project B (In Rs.)
0	(5,00,000)	(5,00,000)
1	7,50,000	2,00,000

2		2,00,000
3		7,00,000

Assuming Cost of Capital equal to 12%, which project should be accepted as per NPV Method and IRR Method?

### Illustration-27 (Rankings)

The cash flows of project C and D are reproduced below:

Project	Cash Flow				NPV at 10%	IRR
	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>		
C	-Rs. 10,000	+ 2,000	+ 4,000	+ 12,000	+ Rs. 4,139	26.5%
D	-Rs. 10,000	+ 10,000	+ 3,000	+ 3,000	+ Rs. 3,823	37.6%

- Why is there a conflict of rankings?
- Why should you recommend project C in spite of lower internal rate of return?

### Illustration-28 (MIRR)

An investment of Rs.1,36,000 yields the following cash inflows (profits before depreciation but after tax). Determine MIRR considering 8% cost of capital.

Year	Cash Inflows (in Rs)
1	30,000
2	40,000
3	60,000
4	30,000
5	20,000
<b>Total</b>	<b>1,80,000</b>

### Illustration – 29 (Replacement chain)

R plc is considering modernizing its production facilities and it has two proposals under consideration. The expected cash flows associated with these projects and their NPV as per discounting rate of 12% and IRR is as follows:

Year	Cash Flow (in Rs.)	
	Project A	Project B
0	(40,00,000)	(20,00,000)
1	8,00,000	7,00,000
2	14,00,000	13,00,000
3	13,00,000	12,00,000
4	12,00,000	
5	11,00,000	
6	10,00,000	
NPV@12%	6,49,094	5,15,488
IRR	17.47%	25.20%

Which project should R plc accept?

### Illustration-30 (Mutually exclusive projects)

The cash flows of two mutually exclusive Projects are as under:

Project	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>
P	(40,000)	13,000	8,000	14,000	12,000	11,000	15,000
J	(20,000)	7,000	13,000	12,000	-	-	-

**Required:**

- Estimate the net present value (NPV) of the Project 'P' and 'J' using 15% as the hurdle rate.
- Estimate the internal rate of return (IRR) of the Project 'P' and 'J'.
- Why there is a conflict in the project choice by using NPV and IRR criterion?
- 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	0.4230	0.3411	0.2751
0.26	1.00	0.7937	0.6299	0.4999	0.3968	0.3149	0.2499

**Illustration-31 (Equivalent Annualized Cost)**

APZ Limited is considering selecting a machine between two machines 'A' and 'B'. The two machines have identical capacity, do exactly the same job, but designed differently. Machine 'A' costs Rs.8,00,000, having useful life of three years. It costs Rs.1,30,000 per year to run. Machine 'B' is an economy model costing Rs.6,00,000, having useful life of two years. It costs Rs.2,50,000 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 10%.

Year	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>
PVIF <sub>10%, t</sub>	0.9091	0.8264	0.7513
PVAF <sub>10%, 2</sub> =			
1.7355			
PVAF <sub>10%, 3</sub> =			
2.4868			

Which machine would you recommend the company to buy?

**Illustration – 32 (Comprehensive)**

Alpha Company is considering the following investment projects:

Projects	Cash Flows (in Rs)			
	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>
A	-10,000	+10,000		
B	-10,000	+7,500	7,500	
C	-10,000	+2,000	4,000	+12,000
D	-10,000	+10,000	3,000	+3,000

- Rank the projects according to each of the following methods: (i) Payback, (ii) ARR, (iii) IRR and (iv) NPV, assuming discount rates of 10 and 30 per cent.

- b. Assuming the projects are independent, which one should be accepted? If the projects are mutually exclusive, which project is the best?

### Illustration-33 (Comprehensive)

The expected cash flows of three projects are given below. The cost of capital is 10 per cent.

- a. Calculate the payback period, net present value, internal rate of return and accounting rate of return of each project.  
b. Show the rankings of the projects by each of the four methods.

Period	Project A (Rs)	Project B (Rs)	Project C (Rs)
0	(5,000)	(5,000)	(5,000)
1	900	700	2,000
2	900	800	2,000
3	900	900	2,000
4	900	1,000	1,000
5	900	1,100	
6	900	1,200	
7	900	1,300	
8	900	1,400	
9	900	1,500	
10	900	1,600	

### Illustration – 34 (Missing Values)

Given below are the data on a capital project 'M':

<b>Annual cost of savings</b>	<b>Rs. 60,000</b>
<b>Useful Life</b>	4 years
<b>Internal rate of return</b>	15%
<b>Profitability index</b>	1.064
<b>Salvage value</b>	0

You are required to calculate for this project M:

- Cost of project
- Payback period
- Cost of capital
- Net present value.

Given the following table of discount factors:

Year	15%	14%	13%	12%
1	0.869	0.877	0.885	0.893
2	0.756	0.769	0.783	0.797
3	0.658	0.675	0.693	0.712
4	0.572	0.592	0.613	0.636
<b>Total</b>	2.855	2.913	2.974	3.038

### Illustration-35 (Replacement decision)

WX Ltd. has a machine which has been in operation for 3 years. Its remaining estimated useful life is 8 years with no salvage value in the end. Its current market value is Rs. 2,00,000. The company is considering a proposal to purchase a new model of machine to replace the existing machine.

The relevant information is as follows:

	Existing Machine	New Machine
<b>Cost of machine</b>	Rs. 3,30,000	Rs.10,00,000
<b>Estimated life</b>	11 years	8 years
<b>Salvage value</b>	Nil	Rs. 40,000
<b>Annual output</b>	30,000 units	75,000 units
<b>Selling price per unit</b>	Rs.15	Rs.15
<b>Annual operating hours</b>	3,000	3,000
<b>Material cost per unit</b>	Rs. 4	Rs. 4
<b>Labour cost per hour</b>	Rs.40	Rs. 70
<b>Indirect cash cost per annum</b>	Rs.50,000	Rs. 65,000

- The company follows the straight-line method of depreciation.
- The corporate tax rate is 30 per cent and WX Ltd. does not make any investment, if it yields less than 12 per cent.
- Present value of annuity of Re. 1 at 12% rate of discount for 8 years is 4.968. Present value of Re. 1 at 12% rate of discount, received at the end of 8th year is 0.404.
- Ignore capital gain tax.

**Advise WX Ltd. whether the existing machine should be replaced or not.**

### Illustration-36 (Replacement decision)

ABC Company Ltd. has been producing a chemical product by using machine Z for the last two years. Now the management of the company is thinking to replace this machine either by X or by Y machine. The following details are furnished to you.

	Z	X	Y
<b>Book value (Rs.)</b>	1,00,000	-	-
<b>Resale Value now (Rs.)</b>	1,10,000	-	-
<b>Purchase Price (Rs.)</b>	-	1,80,000	2,00,000
<b>Annual fixed costs (including depreciation) (Rs.)</b>	92,000	1,08,000	1,32,000
<b>Variable running cost (including labour) per unit (Rs.)</b>	3	1.50	2.50
<b>Production per hour (unit)</b>	8	8	12
<b>Further Details</b>			
<b>Selling price per unit</b>	Rs. 20		
<b>Cost of materials per unit</b>	Rs. 10		
<b>Annual operating hours</b>	2,000		

- Working life of each of the three machines (as from now) is 5 years
- Salvage value of machines Z is Rs. 10,000, X is Rs. 15,000 and Y is Rs.18,000
- The company charges depreciation using straight line method.
- It is anticipated that an additional cost of Rs. 8,000 per annum would be incurred on special advertising to sell the extra output of machine Y.
- Assume tax rate of 50% and cost of capital 10%.

The Present value of Re.1 to be received at the end of the year at 10% is as under:

Year	1	2	3	4	5
<b>Present value</b>	.909	.826	.751	.683	.621

### Required

Using NPV method, you are required to analyse the feasibility of the proposal and make recommendations.



### Illustration- 37 (Q3 Nov 2018)

PD Ltd. An existing company, is planning to introduce a new product with projected life of 8 years. Project cost will be 2,40,00,000. At the end of 8 years no residual value will be realized. The 100% capacity of the project is 2,00,000 units p.a. but the production and sales volume is expected as under:

Year	Number of units
1	60,000 units
2	80,000 units
3-5	1,40,000 units
6-8	1,20,000 units

#### Other information:

- Selling price per unit 200
- Variable cost is 40% of sales
- Fixed cost p.a. 30,00,000
- In addition to these advertisement expenditure will have to be incurred as under:

Year	1	2	3-5	6-8
Expenditure	50,00,000	25,00,000	10,00,000	5,00,000

- Income tax is 25%
- Straight line method of depreciation is permissible for tax purpose.
- Cost of capital is 10%
- Assume that loss cannot be carried forward.

#### Present value table

Year	1	2	3	4	5	6	7	8
PVF @10%	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467

Advice the project acceptable?

### Illustration- 38 (Q5 RTP-Nov 2020)

A large profit making company is considering the installation of a machine to process the waste produced by one of its existing manufacturing process to be converted into a marketable product.

At present the waste is removed by a contractor for disposal on payment by the company of Rs.150 lakh per annum for the next four years. The contract can be terminated upon installation of the aforesaid machine on payment of a compensation of Rs.90 lakh before the processing operation starts. This compensation is not allowed as deduction for tax purposes.

The machine required for carrying out the processing will cost Rs.600 lakh to be financed by a loan repayable in 4 equal instalments commencing from end of year 1. The interest rate is 14% per annum. At the end of the 4<sup>th</sup> year, the machine can be sold for Rs.60 lakh and the cost of dismantling and removal will be Rs.45 lakh.

Sales and direct costs of the product emerging from waste processing for 4 years are estimated as under:

Year	1	2	3	4
Sales	966	966	1254	1254
Material consumption	90	120	255	255
Wages	225	225	255	300
Other expenses	120	135	162	210
Factory overheads	165	180	330	435
Depreciation (as per income tax rules)	150	114	84	63

Initial stock of materials required before commencement of the processing operations is Rs. 60 lakh at the start of year 1. The stock levels of materials to be maintained at the end of year 1, 2 and 3 will be Rs. 165 lakh and the stocks at the end of year 4 will be nil. The storage of materials will utilize space which would otherwise

have been rented out for Rs. 30 lakh per annum. Labour costs include wages of 40 workers, whose transfer to this process will reduce idle time payments of Rs. 45 lakh in the year - 1 and Rs. 30 lakh in the year - 2. Factory overheads include apportionment of general factory overheads except to the extent of insurance charges of Rs. 90 lakh per annum payable on this venture. The company's tax rate is 30%.

Present value factors for four years are as under:

Year	1	2	3	4
PV factors @14%	0.877	0.769	0.674	0.592

Advise the management on the desirability of installing the machine for processing the waste. All calculations should form part of the answer.

### Illustration-39 (Q 1(c) May-2019)

Kanoria Enterprises wishes to evaluate two mutually exclusive projects X and Y.

The particulars are as under :

		Project X (₹)	Project Y (₹)
Initial Investment		1,20,000	1,20,000
Estimated cash inflows (per annum for 8 years)			
Pessimistic		26,000	12,000
Most Likely		28,000	28,000
Optimistic		36,000	52,000

- The cut off rate is 14%.
- The discount factor at 14% are :

Year	1	2	3	4	5	6	7	8	9
Discount factor	0.877	0.769	0.675	0.592	0.519	0.456	0.400	0.351	0.308

Advise management about the acceptability of projects X and Y.

### Illustration- 40 (Q4-May 2019)

AT Limited is considering three projects A, B and C.

The cash flows associated with the projects are given below:

Project	C0	C1	C2	C3	C4
A	(10,000)	2,000	2,000	6,000	0
B	(2,000)	0	2,000	4,000	6,000
C	(10,000)	2,000	2,000	6,000	10,000

You are required to :

- Calculate the payback period of each of the three projects.
- If the cut-off period is two years, then which projects should be accepted?
- Projects with positive NPVs if the opportunity cost of capital is 10 percent.
- "Payback gives too much weight to cash flows that occur after the cut-off date". True or false?
- "If a firm used a single cut-off period for all projects, it is likely to accept too many short-lived projects." True or false?

P.V. Factor @ 10 %

Year	0	1	2	3	4	5
P.V.	1.000	0.909	0.826	0.751	0.683	0.621

### Illustration 41 - (Q4-May 2018)

A company is evaluating a project that requires

- initial investment of Rs. 60 lakhs in fixed assets and
- Rs. 12 lakhs towards additional working capital
- The project is expected to increase annual real cash inflow before taxes by Rs. 24,00,000 during its life.
- The fixed assets would have zero residual value at the end of life of 5 years.
- The company follows straight line method of depreciation which is expected for tax purposes also.
- Inflation is expected to be 6% per year.
- For evaluating similar projects, the company uses discounting rate of 12% in real terms.
- Company's tax rate is 30%.

Advise whether the company should accept the project, by calculating NPV in real terms.

PVIF (12%, 5 years)		PVIF (6%, 5 years)	
Year 1	0.893	Year 1	0.943
Year 2	0.797	Year 2	0.890
Year 3	0.712	Year 3	0.840
Year 4	0.636	Year 4	0.792
Year 5	0.567	Year 5	0.747

### Illustration 42 -(Q 5 RTP May-2018)

company has to make a choice between two projects namely A and B.

- The initial capital outlay of two Projects are ₹ 1,35,000 and ₹ 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

Calculate for each project:

- Discounted payback period
- Profitability index
- Net present value

Decide which of these projects should be accepted?

### Illustration- 43 (Q 5 RTP Nov-2018)

- Shiv Limited is thinking of replacing its existing machine by a new machine which would cost ₹ 60 lakhs.

- The company's current production is 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 ₹ 200 per unit.
- The following is the cost of producing one unit of product using both the existing and new machine :

Unit cost (₹)			
	Existing Machine (80,000 units)	New Machine (1,00,000 units)	Difference
Materials	75.0	63.75	(11.25)
Wages & Salaries	51.25	37.50	(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	165.50	(17.75)

- The existing machine has an accounting book value of ₹ 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 ₹ 2,50,000.
- However, the market price of old machine today is ₹ 1,50,000 and it is expected to be ₹ 35,000 after 5 years.
- The new machine has a life of 5 years and a salvage value of ₹ 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:

- ESTIMATE net present value of the replacement decision.
- CALCULATE the internal rate of return of the replacement decision.
- Should Company go ahead with the replacement decision? ANALYSE.

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>	0.80	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	0.2230

#### Illustration- 44 (Q 1(b) Nov 2019)

- Door Ltd. is considering an investment of ₹ 4,00,000.
- This investment is expected to generate substantial cash inflows over the next five years.
- Unfortunately, the annual cash flows from this investment is uncertain, and the following profitability distribution has been established.

Annual Cash Flow (₹)	Probability

50,000	0.3
1,00,000	0.3
1,50,000	0.4

- At the end of its 5 years life, the investment is expected to have a residual value of ₹ 40,000.
- The cost of capital is 5%

- (i) Calculate NPV under the three different scenarios.  
(ii) Calculate Expected Net Present Value.  
(iii) Advise Door Ltd. on whether the investment is to be undertaken

Year	1	2	3	4	5
DF @ 5%	0.952	0.907	0.864	0.823	0.784

#### Illustration- 45 (Q 1(d) Nov 2019)

A company has ₹ 1,00,000 available for investment and has identified the following four investments in which to invest.

Project	Investment (₹)	NPV (₹)
C	40,000	20,000
D	1,00,000	35,000
E	50,000	24,000
F	60,000	18,000

You are required to optimize the returns from a package of projects within the capital spending limit if-

- (i) The projects are independent of each other and are divisible.  
(ii) The projects are not divisible

#### Illustration-46 (Q 5 RTP May-2019)

BT Pathology Lab Ltd. is using an X-ray machines which reached at the end of their useful lives.

- Following new X-ray machines are of two different brands with same features are available for the purchase

Brand	Cost of Machine (Rs. )	Life of Machine	Maintenance Cost (Rs. )			Rate of Depreciation
			Year 1-5	Year 6-10	Year 11-15	
XYZ	6,00,000	15 years	20,000	28,000	39,000	4%
ABC	4,50,000	10 years	31,000	53,000	--	6%

Residual Value of both of above machines shall be dropped by 1/3 of Purchase price in the first year and thereafter shall be depreciated at the rate mentioned above.

- Alternatively, the machine of Brand ABC can also be taken on rent to be returned back to the owner after use on the following terms and conditions:
  - Annual Rent shall be paid in the beginning of each year and for first year it shall be Rs. 1,02,000.
  - Annual Rent for the subsequent 4 years shall be Rs. 1,02,500.
  - Annual Rent for the final 5 years shall be Rs. 1,09,950.
  - The Rent Agreement can be terminated by BT Labs by making a payment of Rs. 1,00,000 as penalty. This penalty would be reduced by Rs. 10,000 each year of the period of rental agreement.

You are required to:

- (a) ADVISE which brand of X-ray machine should be acquired assuming that the use of machine shall be continued for a period of 20 years.
- (b) STATE which of the option is most economical if machine is likely to be used for a period of 5 years? The cost of capital of BT Labs is 12%

### Illustration- 47 (Q 2(b) May-2019)

Aar Cee Manufacturing Co. is considering a proposal to replace one of its existing machine by the CNC machine.

- In this connection, the following information is available:
- The existing machine was bought 3 years ago for Rs. 15,40,000.
- It was depreciated on straight line basis and has a remaining useful life of 7 years.
- It's annual maintenance cost is expected to increase by Rs. 40,000 from the sixth year of its installation.
- It's present realisable value is Rs. 6,50,000.
- The purchase price of CNC machine is Rs. 27,00,000 and installation expenses of Rs. 95,000 will be incurred.
- Subsidy equal to 15% of the purchase price will be received at the end of first year of its installation. It is subject to same rate of depreciation.
- It's realisable value after 7 years is Rs. 5,70,000.
- With the CNC machine, annual cash operating costs are expected to decrease by Rs. 2,16,000.
- In addition, CNC machine would increase productivity on account of which net cash revenue would increase by Rs. 2,76,000 per annum.
- The tax rate applicable to firm is 30% and cost of capital is 11%.

Required:

- Advise the firm whether to replace the existing machine with CNC machine on the basis of net present value.
- The present value factor at 11% are as follows :

Year	1	2	3	4	5	6	7
PV @ 11%	0.901	0.812	0.731	0.659	0.593	0.535	0.482

### Illustration 48 (RTP Nov 21)

HMR Ltd. is considering replacing a manually operated old machine with a fully automatic new machine. The old machine had been fully depreciated for tax purpose but has a book value of Rs. 2,40,000 on 31st March 2021. The machine has begun causing problems with breakdowns and it cannot fetch more than Rs. 30,000 if sold in the market at present. It will have no realizable value after 10 years. The company has been offered Rs. 1,00,000 for the old machine as a trade in on the new machine which has a price (before allowance for trade in) of Rs. 4,50,000. The expected life of new machine is 10 years with salvage value of Rs. 35,000. Further, the company follows straight line depreciation method but for tax purpose, written down value method depreciation @ 7.5% is allowed taking that this is the only machine in the block of assets.

Given below are the expected sales and costs from both old and new machine:

	Old Machine (Rs)	New machine (`)
Sales	8,10,000	8,10,000
Material cost	1,80,000	1,26,250
Labour cost	1,35,000	1,10,000
Variable overhead	56,250	47,500
Fixed overhead	90,000	97,500
Depreciation	24,000	41,500
PBT	3,24,750	3,87,250
Tax @ 30%	97,425	1,16,175
PAT	2,27,325	2,71,075

From the above information, ANALYSE whether the old machine should be replaced or not if required rate of return is 10%? Ignore capital gain tax.

PV factors @ 10%:

Year	1	2	3	4	5	6	7	8	9	10
PVF	0.90	0.82	0.75	0.683	0.621	0.564	0.513	0.467	0.424	0.386
	9	6	1							

### Illustration 49

An existing company has a machine which has been in operation for two years, its estimated remaining useful life is 4 years with no residual value in the end. Its current market value is Rs. 3 lakhs. The management is considering a proposal to purchase an improved model of a machine gives increase output. The details are as under:

Particulars	Existing Machine	New Machine
Purchase Price	Rs. 6,00,000	Rs.10,00,000
Estimated Life	6 years	4 years
Residual Value	0	0
Annual Operating days	300	300
Operating hours per day	6	6
Selling price per unit	Rs. 10	Rs. 10
Material cost per unit	Rs. 2	Rs. 2
Output per hour in units	20	40
Labour cost per hour	Rs. 20	Rs. 30
Fixed overhead per annum excluding depreciation	Rs. 1,00,000	Rs. 60,000
Working Capital	Rs. 1,00,000	Rs. 2,00,000
Income-tax rate	30%	30%

Assuming that - cost of capital is 10% and the company uses written down value of depreciation @ 20% and it has several machines in 20% block.

Advice the management on the Replacement of Machine as per the NPV method.

The discounting factors table given below:

Discounting Factors	Year 1	Year 2	Year 3	Year 4
10%	0.909	0.826	0.751	0.683

### Illustration 50

A & Co. is contemplating whether to replace an existing machine or to spend money on overhauling it. A & Co. currently pays no taxes. The replacement machine costs ₹ 90,000 now and requires maintenance of ₹ 10,000 at the end of every year for eight years. At the end of eight years it would have a salvage value of ₹ 20,000 and would be sold. The existing machine requires increasing amounts of maintenance each year and its salvage value falls each year as follows:

Year	Maintenance (₹)	Salvage (₹)
Present	0	40,000
1	10,000	25,000
2	20,000	15,000
3	30,000	10,000
4	40,000	0

The opportunity cost of capital for A & Co. is 15%.

REQUIRED:

When should the company replace the machine?

(Note: Present value of an annuity of Re. 1 per period for 8 years at interest rate of 15% : 4.4873; present value of Re. 1 to be received after 8 years at interest rate of 15% : 0.3269).

### Illustration 51

A chemical company is presently paying an outside firm ₹ 1 per gallon to dispose off the waste resulting from its manufacturing operations. At normal operating capacity, the waste is about 50,000 gallons per year. After spending ₹ 60,000 on research, the company discovered that the waste could be sold for ₹10 per gallon if it was processed further. Additional processing would, however, require an investment of ₹ 6,00,000 in new equipment, which would have an estimated life of 10 years with no salvage value. Depreciation would be calculated by straight line method.

Except for the costs incurred in advertising ₹ 20,000 per year, no change in the present selling and administrative expenses is expected, if the new product is sold. The details of additional processing costs are as follows:

Variable : ₹ 5 per gallon of waste put into process.  
Fixed : (Excluding Depreciation) ₹ 30,000 per year.

There will be no losses in processing, and it is assumed that the total waste processed in a given year will be sold in the same year. Estimates indicate that 50,000 gallons of the product could be sold each year.

The management when confronted with the choice of disposing off the waste or processing it further and selling it, seeks your ADVICE. Which alternative would you recommend? Assume that the firm's cost of capital is 15% and it pays on an average 50% Tax on its income.

You should consider Present value of Annuity of ₹1 per year @ 15% p.a. for 10 years as 5.019.

### Illustration 52

XYZ Ltd. is presently all equity financed. The directors of the company have been evaluating investment in a project which will require ₹ 270 lakhs capital expenditure on new machinery. They expect the capital investment to provide annual cash flows of ₹ 42 lakhs indefinitely which is net of all tax adjustments. The discount rate which it applies to such investment decisions is 14% net.

The directors of the company believe that the current capital structure fails to take advantage of tax benefits of debt and propose to finance the new project with undated perpetual debt secured on the company's assets. The company intends to issue sufficient debt to cover the cost of capital expenditure and the after tax cost of issue.

The current annual gross rate of interest required by the market on corporate undated debt of similar risk is 10%. The after-tax costs of issue are expected to be ₹ 10 lakhs. Company's tax rate is 30%.

You are REQUIRED to:

Calculate the adjusted present value of the investment,

Calculate the adjusted discount rate and

Explain the circumstances under which this adjusted discount rate may be used to evaluate future investments.

### Illustration 53

1. Manoranjan Ltd is a News broadcasting channel having its broadcasting Centre in Mumbai. There are total 200 employees in the organisation including top management. As a part of employee benefit expenses, the company serves tea or coffee to its employees, which is outsourced from a third-party. The company offers tea or coffee three times a day to each of its employees. 120 employees prefer tea all three times, 40 employees prefer coffee all three times and remaining prefer tea only once in a day. The third-party charges ₹ 10 for each cup of tea and ₹ 15 for each cup of coffee. The company works for 200 days in a year.

Looking at the substantial amount of expenditure on tea and coffee, the finance department has proposed to the management an installation of a master tea and coffee vending machine which will cost ₹ 10,00,000 with a useful life of five years. Upon purchasing the machine, the company will have to enter into an annual maintenance contract with the vendor, which will require a payment of

₹ 75,000 every year. The machine would require electricity consumption of 500 units p.m. and current incremental cost of electricity for the company is ₹ 12 per unit. Apart from these running costs, the company will have to incur the following consumables expenditure also:

1. Packets of Coffee beans at a cost of ₹ 90 per packet.
2. Packet of tea powder at a cost of ₹ 70 per packet.
3. Sugar at a cost of ₹ 50 per Kg.
4. Milk at a cost of ₹ 50 per litre.
5. Paper cup at a cost of 20 paise per cup.



Each packet of coffee beans would produce 200 cups of coffee and same goes for tea powder packet. Each cup of tea or coffee would consist of 10g of sugar on an average and 100 ml of milk.

The company anticipate that due to ready availability of tea and coffee through vending machines its employees would end up consuming more tea and coffee.

It estimates that the consumption will increase by on an average 20% for all class of employees. Also, the paper cups consumption will be 10% more than the actual cups served due to leakages in them.

The company is in the 25% tax bracket and has a current cost of capital at 12% per annum. Straight line method of depreciation is allowed for the purpose of taxation. You as a financial consultant is required to ADVISE on the feasibility of acquiring the vending machine.

PV factors @ 12%:

Year	1	2	3	4	5
PVF	0.8929	0.7972	0.7118	0.6355	0.5674

## 1 Introduction

Financial Management essentially refers to managing money to ensure adequate profitability and optimum cash flows, and involves three inter-related crucial decisions:

### 1.1 Investment Decisions:

The management of an enterprise decides allocate resources to various investment opportunities under this decision.

For example, how much money can be allocated to buy machinery, or how much money can be invested in acquisition of a new company or how much money should be used to start a new line of business/expand existing Business?

Investment decisions may be long-term or short-term and help to determine *commitment of available resources*

### 1.2 Financing Decisions:

These involves four key questions as listed below:

- i. How much money must be Raised? (Quantum)
- ii. What Should be the source of funds? (Equity, loans, debentures etc.)
- iii. What is the cost of raising funds? (Expected return by shareholders and creditors)
- iv. What are the terms of raising funds? (i.e. repayment terms, timeline etc.)

### 1.3 Dividend Decisions

This involves deciding the following:

- i. Whether dividends are to be paid?
- ii. How much of dividend is to be paid? How much of current year's profit are to be retained? (Quantum)
- iii. When should the dividend be paid? (Annual or interim)
- iv. Dividend should be paid in what form? (Cash or Stock)

## 2 Meaning of Dividend

Dividend is the part of profit which is distributed to the shareholders of the company.

Particulars	Reference	Amount (in ₹)
Profit before tax	A	500
Less: Taxes to be paid (at 30%)	$B=A*\text{tax rate}$	150

Profit after tax	$C=A-B$	350
Dividend to be distributed	D	250
Retained Earning	$E=C-D$	100

Further, Dividend can be paid out of accumulated profits- i.e., profits which were retained earnings in previous years.

Dividend can be paid annually, half-yearly or quarterly based on the management's discretion. When dividend is distributed half-yearly or quarterly or at any other point in time other than being declared at the Annual General Meeting (AGM) – It is known as Interim dividend

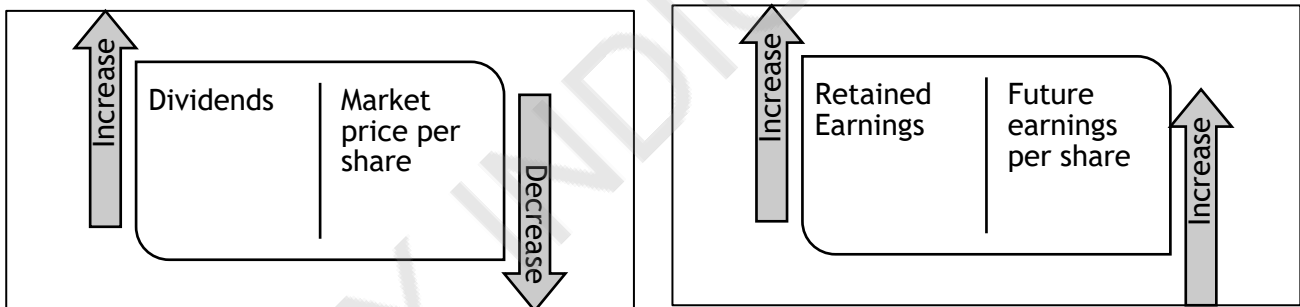
### 3 Significance of Dividend

The aforementioned dividend decisions are made by the Board keeping in mind the following key objectives

#### 3.1 Wealth Maximization:

Owing to volatility of the stock market, shareholders tend to assign more value to dividends in the near future than future dividends and capital gains. Dividend payouts also influence the market price of a share. More dividend payouts, increase the market price and vice-versa.

On the other hand, use of retained earnings in investment increases the future earnings per share. And, increased dividends decrease future earnings per share as less funds are available for investments.



Thus, the Board take dividend decisions which dividend net earnings into retained earnings and dividend payouts optimally so as to maximise the wealth of shareholders.

#### 3.2 Long term Financing

Every enterprise has multiple sources of funds – for example, loans, equity, accumulated profits etc. However, obtaining loans and raising equity by fresh issue of share capital involves floatation costs. Hence, many enterprises, thereby reducing its capacity to make further investments, the Board of Directors must consider the following before finalizing the dividend to be declared.

- i. Whether investment opportunities are available
- ii. Whether the return on investment (RoI) on such investments is higher than the cost of capital ( $K_e$ )

### Concept Capsule 1:

**Dividend Rate:** Dividends are typically expressed as a percentage of the face value of shares. The percentage is called Dividend Rate

#### Example

Face value per share 10

Dividend Per share 2

$$\text{Dividend Rate} = R = \frac{DPS}{FV \text{ per share}}, \text{Therefore here}$$

$$R = \frac{2}{10} = 20\%$$



*Floatation cost includes legal fees, certificate printing fees, registration fees, stock exchange listing fees, underwriting fees etc.*



In essence, The Board must find a balance between current income for shareholders (dividends) and growth of the company through retained earnings.

## Concept Capsule 2:

**Dividend Yield:** Dividend per share expressed as a percentage of the market value of shares. This percentage is called Dividend Rate.

### Example

Market Price per share = ₹100

Dividend Per share = ₹ 2

$$\text{Dividend Yield} = \text{DY} = \frac{\text{DPS}}{P_0}$$

$$\text{DY} = \frac{2}{100} = 2\%$$

**Dividend Payout:** Dividend Payout expresses as a percentage of earnings per share.

### Example

Earnings per share = ₹ 20

Dividend per share = ₹ 2

$$\text{Payout} = \frac{\text{DPS}}{\text{EPS}}, \text{Therefore here}$$

$$= \frac{2}{20} = 10\%$$

**Growth Rate:** Growth rate is a function of retained earnings and return on equity

b=retention (%)

r=return on equity (%)

g=growth rate of individual (%)

$$\text{DR} = \frac{\text{DV}}{\text{FV per Share}}, g = b \times r$$

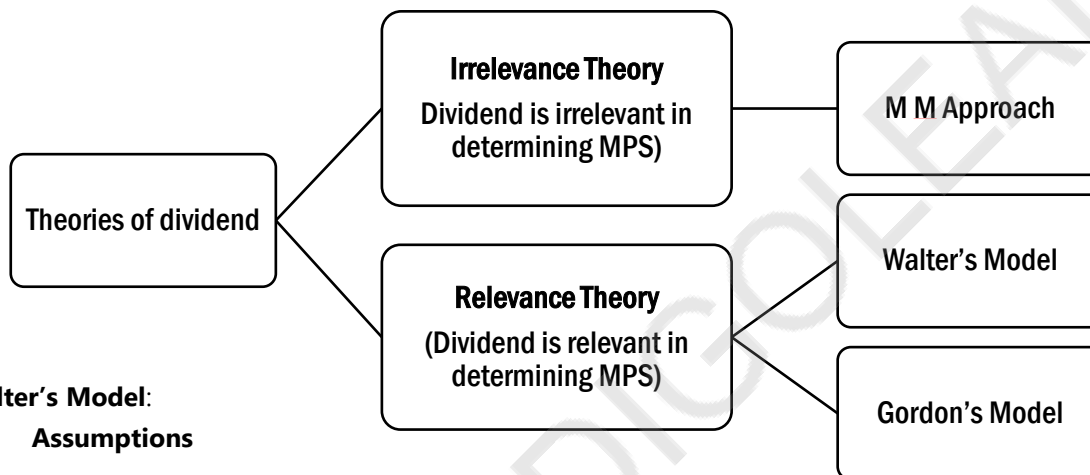
$$= \frac{10}{2} = 2\%$$

### Concept Capsule 3:

**Cost of Equity (Ke):** Cost of equity includes dividends distributed and applicable dividend

$$K_e = \frac{D_1}{P_0} + g$$

## 4 Theories of Dividend



### Walter's Model: Assumptions

1. **All equity:** The firm is an equity firm with no debt
2. **Fixed Investment Policy:** All investments should be financed through retained earnings
3. **Perfect Capital Markets:** The firm functions in a market where all the investors are rational and information is freely available to all.
4. **No taxes:** no tax discrimination between dividend income and capital gain. This assumption is necessary as the tax rates or provisions to tax income shall be different in different countries.
5. **No Transaction Cost:** The costs may differ from country to country and market to market.
6. **Perpetual Life:** The Firm has perpetual life

### Formula

$$P_0 = \frac{D}{K_e} + \frac{r}{K_e} (E-D)$$

P<sub>0</sub> = Current Market price per share

D = Dividend per share

E = Earnings per share

Ke = Cost of Equity

r = Rate of return

### Hypothesis

James E Walter propounded the theory that in the long run, the market price of shares reflects the present value of expected dividends and capital gains. Accordingly, the formula is an addition of present value of dividends and retained earnings.

$$= \frac{D}{K_e} + \frac{r}{K_e} (E-D)$$

Present value of dividends

Present value of Retained Earnings

In the aforesaid formula, retained earnings is represented by (E-D) i.e. earnings per share minus dividend per share, growing at the internal rate of return (r).

Walter explained that if the rate of return is higher than the market capitalization rate, the value of shares would be high even if dividends are low. However, if the rate of return is lower than the market capitalization rate, the value of the share will be low. He argued that if the rate of return is equal to the market capitalization rate, dividend at any rate would be considered optimum.

Thus, he concluded the following:

Firm	Condition of r and Ke	Correlation between Dividend and MPS	Optimum Dividend Payout Ratio
<b>Growth</b>	$r > K_e$	Negative	0%
<b>Constant/Normal</b>	$R = K_e$	No Correlation	<b>Any%</b> (Every payout ratio is optimum)
<b>Declining</b>	$R < K_e$	Positive	<b>100%</b>

### Limitations

- Other Factors:** The hypothesis does not consider all factors affecting dividend policy and share prices. Further, the formula ignores factors such as taxation, various legal and contractual obligations etc.
- No debt:** It assumes that the Firm shall not borrow money and merely be dependent upon retained earnings and fresh equity issue

- c) **Constant Ke:** It assumes that Ke will remain constant throughout the life of the Firm which means that the risk associated with the business of the Firm shall be the same. However, in reality, risks change over time.
- d) **Constant r:** Further, it assumes that the rate of return on all investment shall remain the same.

### Advantages

- a) The formula is simple to understand and easy to compute.
- b) It considers market capitalization rate, internal rate of return, and dividend payout ratio as factors to determine market value of a share.

### GORDEN'S Model (DIVIDEND DISCOUNT MODEL)

#### Assumptions

1. **All equity:** The firm is all equity firm with no debt
2. **Fixed Investment Policy:** All investment should be financed through retained earnings
3. **No taxes:** or no tax discrimination between dividend income and capital gain. This assumption is necessary as the tax rates or provisions to tax income shall be different in different countries.
4. **Perpetual Life:** The Firm has perpetual life
5. **Constant r & Ke:** Internal rate of return and market capitalization rate are assumed to be constant throughout the life of the firm.
6. **Constant dividend payout ratio:** Constant retention ratio is assumed and accordingly, growth rate is also constant since rate of return is also assumed to be constant. ( $g = b \times r$ )
7. **Ke > g:** Ke is assumed to be greater than growth.

#### Formula

$P_0$  = Current Market price per share

$$P_0 = \frac{D_1}{K_e - g}$$

$D_1$  = Dividend per share next year

$g$  = Growth rate of dividends

$K_e$  = Cost of Equity



## Hypothesis

Myron Gordon propounded the theory that the market price of share is the present value of expected dividends.

Since it assumed that the growth rate of dividends remains constant throughout the life of the Firm, the formula depicts that the market price is ascertained as the present value of a growing perpetuity.

The formula shows that when the rate of return is higher than the discount rate, the price per share increases as the dividend ratio decreases and if the return is less than the discount rate, the price per share decreases.

Accordingly, the price per share shall remain unchanged where the rate of return and discount rate are equal.

Consequently, the conclusion of Walter's and Gordon's model remains the same as tabulated below:

Firm	Condition of $r$ and $K_e$	Correlation between Dividend and MPS	Optimum Dividend Payout Ratio
Growth	$R > K_e$	Negative	0%
Constant/Normal	$R = K_e$	No correlation	Any % (Every Payout ratio is optimum)
Declining	$R < K_e$	Positive	100%

## Limitations

- Other Factors:** The hypothesis does not consider all factors affecting dividend policy and share prices. Further, the formula ignores factors such as taxation, various legal and contractual obligations etc.
- No debt:** It assumes that the Firm shall not borrow money and merely be dependent upon retained earnings and fresh equity issue.
- Constant  $K_e$ :** It assumes that  $K_e$  will remain constant throughout the life of the Firm which means that the risk associated with the business of the Firm shall be the same. However, in reality, risks change over time.
- Constant  $r$ :** Further, it assumes that the rate of return on all investment shall remain the same.
- $K_e > g$  assumption:** In case the growth rate is higher than the  $K_e$ , the price of the share shall be negative as per the formula given. In reality, the price of a share cannot be negative since growth rate is higher than  $K_e$ .

## Advantages

- The formula is simple to understand and easy to compute.
- It considers the market value of a share to be a reflection of present value of future cash flows.

## Important considerations for Gordon's Model

1. With dividends growing at constant rate of  $g$ , the share price also grows at  $g$ .  $P_0 = D_1/(r-g)$   
Multiplying both sides by  $(1+g)$  gives as follows:

$$P_0 (1+g) = D_1 (1+g)/(r-g)$$

$$P_1 = D_2/(r-g)$$

So, both dividend and price have grown at the rate of  $g$  given  $r$  is constant.

1. Growth rate  $g$  is also referred to as capital appreciation or capital yield.
2. The dividend yield which is  $D_1/P_0$  at  $t=0$  will be constant as both dividend and price are expected to grow at the same rate, leaving dividend yield unchanged.

## LINTERS MODEL

### Assumptions

1. **Long term dividend payout ratio:** Firms maintain a fixed dividend payout over a long term.
2. **Management Concern:** Managers are more concerned with changes in dividends than the absolute number of dividends. They are reluctant to effect dividend changes if the same have to be reversed.
3. **Dividend Changes in long run:** Dividend changes follow changes in long run sustainable earnings. This is also due to the fact that managers decide dividend changes only if they foresee that the same is maintainable in future years to manage investor expectations.

### Formula

$$D_1 = D_0 + [(EPS \times \text{Target Payout}) - D_0] \times AF$$

**$D_1$**  = Dividend per share next year

**$D_0$**  = Dividend per share in current year

**EPS** = Earnings per share

**AF** = Adjustment Factor

### Hypothesis

John Linter based his model on a series of interviews he conducted with corporate managers in mid 1950s. As per his theory, current year dividend is dependent upon current year's earnings and last year's dividend.

### Limitations

- a. The adjustment factor is an arbitrary number.
- b. The formula does not ascertain market price of the share.

## Advantages

The formula is simple to understand and easy to compute.

## MODIGLIANI AND MILLER (M.M) HYPOTHESIS (IRRELEVANCE THEORY)

This theory proposed by Franco Modigliani and Merton Miller in 1961 was an approach in the support of irrelevance of dividends in determining market value of a share.

### Assumptions of the M.M Hypothesis

1. **Perfect Capital Markets:** The firm functions in a market where all the investors are rational, and information is freely available to all.
2. **No taxes:** or no tax discrimination between dividend income and capital gain. This assumption is necessary as the tax rates or provisions to tax income may be different in different countries.
3. **Fixed Investment Policy:** It is necessary to assume that all investment should be financed through equity only as implication after using debt as a source of finance may be difficult to understand.
4. **No Transaction Cost:** The costs may differ from country to country and market to market.
5. **Risk of Uncertainty:** It does not exist as investors are able to forecast future prices and dividend with certainty and one discount rate is appropriate for all securities and time periods

### Formula

$$V_f \text{ or } nP_0 = \frac{(n + \Delta n)P_1 - I + E}{1 + K_e}$$

$V_f$  = Value of firm at the beginning of the period

$nP_0$  = number of shares in the beginning of the period X Current Market price per share

$n$  = number of shares in the beginning of the period

$\Delta n$  = number of shares issued

$P_1$  = Market price at end of the period

$I$  = Amount required for investment

$E$  = Total earnings during the period

$K_e$  = Cost of Equity

### Hypothesis

The model considers that the market value of equity shares of a firm depends only on its earning power and is not influenced by any manner in which its earnings are split between dividends and its retained earnings. It propounds that the market value of equity shares is not influenced by dividend size.

Consider this illustration to examine the hypothesis under this model:

**Facts:** A Ltd has outstanding 10,000 shares available at a market price of Rs. 100. The market capitalization rate is 10%. A Ltd. expects to have a net income of Rs. 100,000 at the end of the year and proposes to invest Rs. 200,000. The management intends to declare dividend of Rs. 5 per share at the end of the current year.

**Scenario 1: A Ltd does not pay any dividend**

**Step 1: Market price of the share at the end of the period**

$$P_0 = \frac{P_1 + D_1}{1 + Ke}$$

$$= 100 = P_1 + 0 / 1 + 0.10$$

$$= P_1 = 110$$

**Step 2: Computing funds required for proposed investment**

Particulars	Reference	Amount (in Rs)
Earnings	A	100,000
Less: Dividend distributed	B	Nil
Funds available for investment	C = A-B	100,000
Total Proposed Investment	D	200,000
Balance funds required	E = D-C	100,000

**Step 3: Number of shares to be issued for balance funds required:**

$$\Delta n = \text{Funds required} / \text{Price at end}$$

$$\Delta n = 100,000 / 110$$

**Step 4: Calculation of Value of Firm**

$$V_f \text{ or } nP_0 = \frac{(n + \Delta n)P_1 - I + E}{1 + Ke}$$

$$nP_0 = \frac{(10,000 + 1,00,000/110)110 - 200,000 + 100,000}{(1 + 0.1)}$$

$$= 10,00,000$$

**Scenario 2: A Ltd pays the proposed dividend**

**Step 1: Market price of the share at the end of the period**

$$P_0 = \frac{P_1 + D_1}{1 + Ke}$$

$$= 100 = P_1 + 5 / 1 + 0.10$$

$$= P_1 = 105$$

## Step 2: Computing funds required for proposed investment

Particulars	Reference	Amount (in Rs)
Earnings	A	100,000
Less: Dividend distributed	B	(50,000)
Funds available for investment	C = A-B	50,000
Total Proposed Investment	D	200,000
Balance funds required	E = D-C	150,000

## Step 3: Number of shares to be issued for balance funds required:

$\Delta n = \text{Funds required} / \text{Price at end}$

$\Delta n = 150,000 / 105$

## Step 4: Calculation of Value of Firm:

$$V_f \text{ or } nP_0 = \frac{(n + \Delta n)P_1 - I + E}{1 + K_e}$$

$$nP_0 = \frac{(10,000 + 1,50,000/105)105 - 200,000 + 100,000}{(1 + 0.1)}$$

= 10,00,000

Thus, it can be seen that the value of the firm remains the same irrespective of whether dividends are paid or not.

## Limitations

1. Validity of various assumptions is questionable.
2. It may not be valid under uncertainty.

## Advantages

1. This model is logically consistent.
2. It provides a satisfactory structure of the dividend policy with the concept of Arbitrage process.

## Forms of Dividends

- a. **Cash Dividend:** This is the most common of dividend. Firms pay dividends to their investors in cash through warrant / demand drafts / cheque / pay order / electronic clearing service etc.
- b. **Stock Dividend (Bonus Shares):** This is the allotment of shares by the enterprise for no consideration received from the investors. The reserves of the enterprise are reduced and converted to equity shares by issue of equity shares to the investors. The enterprise is benefitted as cash is not paid and investors benefit as bonus shares received are taxed only on sale. Receipt of bonus shares does not attract tax as per the extant income tax law in India.

Example: A 1:3 bonus means that for every 3 shares held; one share shall be allotted free of cost. The balance sheet shall be affected as tabulated below:

Before Bonus Share		Post Bonus Issue	
Particulars	Amount (in Rs)	Particulars	Amount (in Rs)
Equity Share capital (600,000 shares of Rs. 10 each)	60	Equity Share capital (800,000 shares of Rs. 10 each)	80
Reserves & Surplus	140	Reserves & Surplus	120
<b>Total</b>	<b>200</b>	<b>Total</b>	<b>200</b>

capital increases by 200,000 shares of Rs. 10 each since 1 share is issued for every 3 shares held.

Let's assume the market price of the share before bonus issue was Rs. 45. This would imply a market capitalization of Rs. 45 X 600,000 shares = Rs, 270,00,000.

Post the bonus issue, the market capitalization shall remain the same. However, the number of shares has now increased to 800,000. Accordingly, the market price of the share shall be Rs. 270,00,000 / 800,000 = 33.75 per share.

#### Formula

$$\text{Post Bonus Price} = \frac{S \times P_0}{S + N}$$

$P_0$  = Current Market price per share

$S$  = No. of shares outstanding before bonus issue

$N$  = Number of bonus shares issued.

#### Stock Split

Stock split means splitting one share into many. It essentially implies a reduction in the face value of shares. For example, one share of Rs. 500 shall be split into 5 shares of Rs. 100 each.

This is a tool often used by companies whose stock value per share increases beyond a point where it becomes less tradable. For example, if the stock price reaches Rs. 5,000 per share, the company may opt to split the stock to reduce the market price to Rs, 500 per share.

#### Advantages:

- Increases affordability:** Stock split increases the affordability of a share to small / medium investors.
- Increases Potential Investment:** Increase in number of shares increases the potential of investment as a greater number of investors can now invest.

#### Limitations:

- Additional Cost:** The exercise of splitting a stock shall involve cost to the company
- Increase in speculators:** Lower prices of shares attracts small investors and speculators which are generally not preferred by a company

#### Example:

Taking the same facts of the case as given in the bonus example above, a stock split ratio could be 4:3, which means that 4 shares for every 3 shares held. Consequently, the par value will be reduced to Rs. 7.5 since this is a 75% split (Computed as  $\frac{3}{4}$ ).

Accordingly, the number of shares will be increased to 800,000 shares  $[(4 \times 600,000) / 3]$  of Rs. 7.5 each. The market price of the share after the stock split shall also amount to Rs. 33.75 since the market capitalization of Rs. 270,00,000 shall remain unchanged for the 800,000 shares.

The balance sheet shall be appear as given below:

Before Stock Split		Post Stock Split	
Particulars	Amount (in Rs)	Particulars	Amount (in Rs)
Equity Share capital (600,000 shares of Rs. 10 each)	60	Equity Share capital (800,000 shares of Rs. 7.5 each)	60
Reserves & Surplus	140	Reserves & Surplus	140
<b>Total</b>	<b>200</b>	<b>Total</b>	<b>200</b>

#### Formula

$$\text{Post Stock Split Price} = \frac{S \times P_0}{S + N}$$

$P_0$  = Current Market price per share

$S$  = No. of shares outstanding before stock split

$N$  = Increase in shares on account of stock split

## DETERMINANTS OF DIVIDEND

**Dividend Decisions of a firm are based on the following key factors:**

- a. **Availability of Funds:** If a firm requires funds in the short-medium term, the firm shall prefer a low payout ratio to utilize the retained earnings available as the same does not involve floatation costs.
- b. **Cost of Capital:** In case the firm has access to debt (which is relatively a cheaper source of finance), the firm would prefer to distribute more dividend. However, in case the firm does not have access to external financing, it would be preferable to use retained earnings.
- c. **Capital Structure:** Firms should have an optimum debt-equity ratio. Accordingly, the firm would consider the existing debt-equity ratio prior to declaration of dividend.
- d. **Stock Price:** Higher dividends typically increase the market price of shares. Accordingly, the management would consider the impact on stock price on account of dividends declared.
- e. **Investment Opportunities available:** In case the firm has many viable investment opportunities, the firm would prefer to pay less dividends and invest retained earnings in projects.
- f. **Internal rate of return:** If the internal rate of return ( $r$ ) is more than the cost of retained earnings, it would be preferable to pay retain more.
- g. **Industry Trends:** Firm would strive to meet the industry standards as few industries receive investments from investors who are expecting a regular, stable source of income. Some investors invest in a few industries where the risk appetite is more, and hence even if dividends declared are not regular / stable, the same would be acceptable.
- h. **Investor's expectations:** Some investors invest for growth and some invest to earn regular income. The Firm must bear in minds the expectations of the investors before making dividend decisions.
- i. **Legal Constraints:** Section 123 of the Companies Act, 2013 and related rules must be followed by the firm while declaring dividend.
- j. **Taxation:** The Firm must be aware of the tax implications on dividend declaration and must comply with the same.



## Share Buyback

Meaning:

1. Buying/repurchasing own shares by the company resulting into decrease in share capital of the company
2. The shares bought back are cancelled leading reduction in outstanding number of shares.
3. Share buyback is also a form of shareholders dividend. As the number of circulating shares in the market fall, amount of dividend per share in the future increases.
4. There are two main types of buyback that can be performed by the companies

A. Through open market

B. Through tender offer

5. If company intends to buyback through open market it needs to go through secondary market.
6. If through tender offer, it can offers a fixed price where all the shareholders can participate or sell their shares.

## DIVIDEND DECISIONS ILLUSTRATIONS

### Illustration 1 (Walter's Model)

XYZ Ltd. which earns Rs.10 per share is capitalized at 10% and has a return on investment of 12% Dividend is Rs. 8 per share.

Determine the optimum dividend pay-out ratio and the price of the share at the pay-out as per Walter's model.

### Illustration 2 (Walter's Model)

The following information pertains to M/s XY Ltd.

<b>Earnings of the company</b>	Rs. 5,00,000
<b>Dividend Pay-out Ratio</b>	60%
<b>No. of shares outstanding</b>	Rs. 1,00,000
<b>Equity capitalization rate</b>	12%
<b>Rate of return on investment</b>	15%

1. What would be the market value per share as per Walter's model?
2. What is the optimum dividend pay-out ratio according to Walter's model and the market value of Company's share at that pay-out ratio?

### Illustration 3 (Walter's Model)

The following figures are collected from the annual report of XYZ Ltd.:

Particulars	
<b>Net Profit</b>	30 lakhs
<b>Outstanding 12% preference shares</b>	100 lakhs
<b>No. of equity shares</b>	3 lakhs
<b>Return on Investment</b>	20%
<b>Cost of capital i.e. (ke)</b>	16%

What should be the approximate dividend pay-out ratio to keep the share price at Rs. 42 by using Walter model?

### Illustration 4 (optimal dividend policy)

The following information is supplied to you:

Particulars	Value in Rs
<b>Total Earnings</b>	2,00,000
<b>No. of equity shares (of Rs. 100 each)</b>	20,000
<b>Dividend paid</b>	1,50,000
<b>Price/ Earnings ratio</b>	12.5
<b>r (rate of return)</b>	10%

Applying Walter's Model

1. Ascertain whether the company is following an optimal dividend policy.
2. Find out what should be the P/E ratio at which the dividend policy will have no effect on the value of the share,
3. Will your decision change, if the P/E ratio is 8 instead of 12.5?

### Illustration 5 (Walter's model)

- The earnings per share of a company are Rs. 8,
- The rate of capitalization applicable to the company is 10%.
- The company has before it an option of adopting a payout ratio of 25% or 50% or 75%.

Using Walter's formula of dividend payout, Compute the market value of the company's share if the productivity of retained earnings is (i) 15% (ii) 10% and (iii) 5%. Explain fully what inferences can be drawn from the above exercise?

### Illustration 6 (Walter & Gordan)

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
Dividends per share (DPS)	Rs.6
Cost of Capital	20%
Internal rate of return on investment	25%
Retention ratio	40%

### Illustration 7 ( Constant growth rate approach)

There are three different firms: Growth Firm, Normal Firm, Declining Firm -

Factors	Growth Firm $r > K_e$	Normal Firm $r = K_e$	Declining Firm $r < K_e$
<b>r (rate of return on retained earnings)</b>	15%	10%	8%
<b><math>K_e</math> (Cost of Capital)</b>	10%	10%	10%
<b>E (Earning Per Share)</b>	Rs.10	Rs.10	Rs.10
<b>b (Retained Earnings)</b>	0.6	0.6	0.6
<b>1- b</b>	0.4	0.4	0.4

- Compute the market price of these three Firms under Gordon's model
- Also compute the market price per share if the Retention ratio is 0.4, Explain the inference.

### Illustration 8 ( Variable growth model)

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

- rises to 8%, and
- 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%.

### Illustration 9 ( Graham & Dodd)

The following information regarding the equity shares of M ltd. is given:

<b>Market price</b>	<b>Rs.58.33</b>
<b>Dividend per share</b>	<b>Rs.5</b>

**Multiplier**

7

According to the Graham & Dodd approach to the dividend policy, compute the EPS.

### Illustration 10 ( Traditional model)

The dividend pay-out ratio of H Ltd. is 40%. If the company follows traditional approach to dividend policy with a multiplier of 9, what will be the P/E ratio?

### Illustration 11 (MM)

RST 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 of which the company belongs is 12%. What will be the market price of the share at the end of the year, if?

- i. a dividend is not declared?
- ii. a dividend is declared?
- iii. assuming that the company pays the dividend and has net profits 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.**

### Illustration 12 (MM)

AB Engineering Ltd. belongs to a risk class for which the capitalization rate is 10%. It currently has outstanding 10,000 shares selling at Rs.100 each. The firm is contemplating the declaration of a dividend of Rs.5 per share at the end of the current financial year.

It expects to have a net income of Rs.1,00,000 and has a proposal for making new investments of Rs. 2,00,000.

Using MM Hypothesis, prove that value of the firm remains constant irrespective of Dividend Policy.

### Illustration 13 (MM)

M Ltd. belongs to a risk class for which the capitalization rate is 10%. It has 25,000 outstanding shares and the current market price is Rs.100. It expects a net profit of Rs.2,50,000 for the year and the Board is considering dividend of Rs.5 per share. M Ltd. requires to raise Rs.5,00,000 for an approved investment expenditure.

Show, **how the MM approach affects the value of M Ltd. if dividends are paid or not paid.**

### Illustration 14 (1(b) Nov 2018)

Following information relating to Jee Ltd. is given:

Particulars	
Profit after tax	Rs. 10,00,000
Dividend pay-out ratio	50%
Number of Equity Shares	50,000
Cost of Equity	10%
Rate of return on Investment	12%

- i. What would be the market value per share as per Walter's Model?
- ii. What is the optimum dividend pay-out ratio according to Walter's Model and Market value of equity share at that pay-out ratio?

### Illustration 15 (1(d) May 2019)

The following information is supplied to you

Total Earning	Rs. 40 Lakhs
---------------	-----------------

No. of Equity Shares (of Rs. 100 each)	4,00,000
Dividend Per Share	Rs. 4
Cost of Capital	16%
Internal rate of return on investment	20%
Retention ratio	60%

Calculate the market price of a share of a company by using :

- Walter's Formula
- Gordon's Formula

### Illustration 16 (Q9 May 2018 RTP)

The following information relates to Navya Ltd:

Earnings of the company	₹ 20,00,000
Dividend pay-out ratio	60%
No. of Shares outstanding	₹ 4,00,000
Rate of return on investment	15%
Equity capitalization rate	12%

Required:

- Determine what would be the market value per share as per Walter's model.
- Compute optimum dividend pay-out ratio according to Walter's model and the market value of company's share at that pay-out ratio

### Illustration 17 [Q1(c) Nov 2019]

Following figures and information were extracted from the company A Ltd.

Earnings of the company	₹ 10,00,000
Dividend paid	₹ 6,00,000
No. of shares outstanding	2,00,000
Price Earnings Ratio	10
Rate of return on investment	20%

You are required to calculate:

- Current Market price of the share
- Capitalisation rate of its risk class
- What should be the optimum pay-out ratio?
- What should be the market price per share at optimal pay-out ratio? (use Walter's Model)

### Illustration 18

Mr H is currently holding 1,00,000 shares of HM Ltd, and currently the share of HM Ltd is trading on Bombay Stock Exchange at ` 50 per share. Mr A have a policy to re-invest the amount of any dividend received into the shared back again of HM Ltd. If HM Ltd has declared a dividend of ` 10 per share, please determine the no of shares that Mr A would hold after he re-invests dividend in shares of HM Ltd.

### Illustration 19

Following information is given pertaining to DG Ltd,

No of shares outstanding	1 lakh shares
Earnings Per share	25 per share
P/E Ratio	20
Book Value per share	400 per share

If company decides to repurchase 5,000 shares, at the prevailing market price, what is the resulting book value per share after repurchasing.

**Illustration 20**

X Ltd, is a no growth company, pays a dividend of Rs.5 per share. If the cost of capital is 10% , what should be the current market price of the share?

**Illustration 21**

XYZ is a company having share capital of Rs.10 Lakhs of Rs.10 each. It distributed current dividend of 20% per annum. Annual growth rate in dividend expected is 2%. The expected rate of return on its equity capital is 15%.

## 1 Working Capital

**Working Capital** is the Capital required for smooth and uninterrupted functioning of the business

$$\text{Working Capital} = \text{Current Assets} (-) \text{Current Liabilities}$$

### Current Assets

**Current Assets are those, which can be converted into cash within a short duration, i.e. generally less than one year. They are constantly being transformed into other forms, e.g., finished goods are transformed into debtors, debtors are converted into cash, etc.**

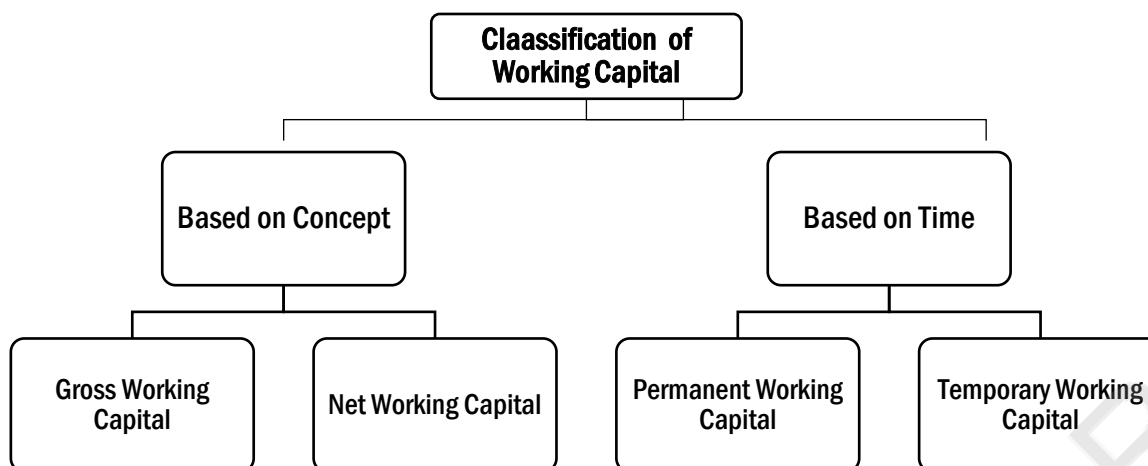
**Current Assets are -**  
Inventories, Debtors,  
Cash and Bank Balances,  
Prepaid Expenses, Loans  
and Advances,  
Marketable Investments.

### Current Liabilities

**Current Liabilities are those which fall due for payment or settlement within a short duration, i.e. generally less than one year.**

**Current Liabilities are -**  
Creditors, Outstanding  
Expenses, Tax Provision,  
Proposed and Unclaimed  
Dividend, Short Term  
Loans, Bank Overdraft,  
Cash Credit.

## 2 Various ways in which Working Capital Can be Classified



Working Capital can be classified based on (a) Concept or (b) Time Factor

### 2.1 Based on Concept - Gross and Net Working Capital:

2.1.1 Gross Working Capital = Current Assets only

2.1.2 Net Working Capital = Current Assets Less Current Liabilities. In general, whenever we use the term working capital, we mean net working capital only.

### 2.2 Based on Time Factor - Permanent and Temporary Working Capital

2.2.1 **Permanent Working Capital:** It is the minimum level of investment required in the business at any point of time and hence at all points of time. **It is also called Fixed or Hard-Core Working Capital**

- It remains constant for a period of time.
- It is required even during slack season.
- Permanent working capital can change
  1. with the growth of the firm.
  2. change in firm's policy regarding current assets.
  3. Change in technology where a new machine can reduce the conversion time of raw material into finished goods.
- **Financing of permanent working capital:** Permanent working capital is financed out of long-term funds.

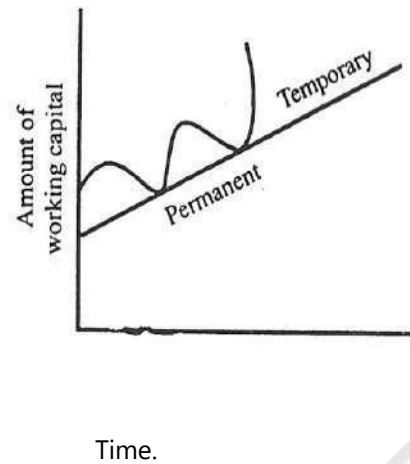
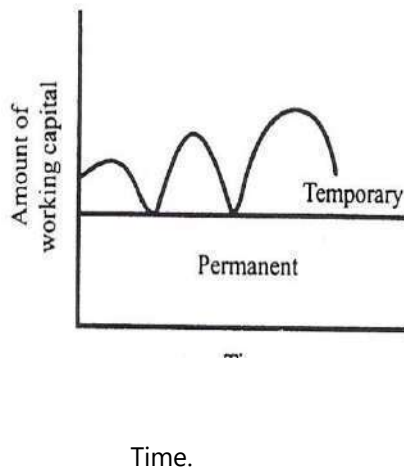
2.2.2 **Temporary Working Capital (TWC): Permanent working capital is financed out of long-term funds and It is dependent on factors like peak season, trade cycle, boom, recession, demand changes etc.**

- It is dependent on factors like peak season, trade cycle, boom, recession, demand changes etc.
- It is also called as Fluctuating or Variable Working Capital.
- Its requirement may complete decline during slack time
- **Financing of temporary working capital:** It is financed from short-term sources.

There are **two views as to amount the amount of working Permanent working Capital**. (Refer Diagram)

- The first view* is that the amount of Permanent Working Capital remains the same over all periods of time.
- The more logical second view* is that the Permanent Working Capital increases in amount (rupee value) based on the activity levels of the firm. For example, Working Capital of Rs. 10 lakhs maybe sufficient for a turnover level of Rs. 50 lakhs. But when the turnover increases to Rs. 100 Crores after a certain time period, the amount of Working Capital should rise proportionately.





### 3 Importance of Adequate Working Capital

The need for adequate investment in Working Capital can be understood from the following points:

1. Working Capital is required **to use fixed assets profitably**. For example, a machine cannot be used productively without raw materials.
2. Funds are **required for day-to-day operations and transactions**. These are provided by Cash and Cash Equivalents, forming part of Current Assets.
3. Adequate Working Capital **determines the short-term solvency of the firm**. Inadequate working capital means that the firm will be unable to meet its immediate payment commitments. This represents under-capitalization.
4. **Increase in activity levels and sales** should be backed up by suitable investment in working capital.
5. The aspects of **liquidity and profitability** should be suitably analyzed by the Finance Manager. Too much emphasis on profitability may affect liquidity.

Shortcomings of excessive working capital	Shortcomings of inadequate working capital
<ul style="list-style-type: none"> <li>• In case of too much debtors, risk of bad debt increases.</li> <li>• Excess inventory increases the risk of waste and theft and increases the carrying cost.</li> <li>• Excess funds blocked in working capital results in low rate of return on capital employed.</li> </ul> <p>It decreases profitability.</p>	<ul style="list-style-type: none"> <li>• Production may stop due to shortage of raw material.</li> <li>• Fixed assets are not efficiently utilized.</li> <li>• Firm may be unable to deliver on time due to insufficient finished goods, resulting in losing customers.</li> <li>• Firm may not be able to pay its short-term obligations, thus, losing goodwill.</li> </ul>

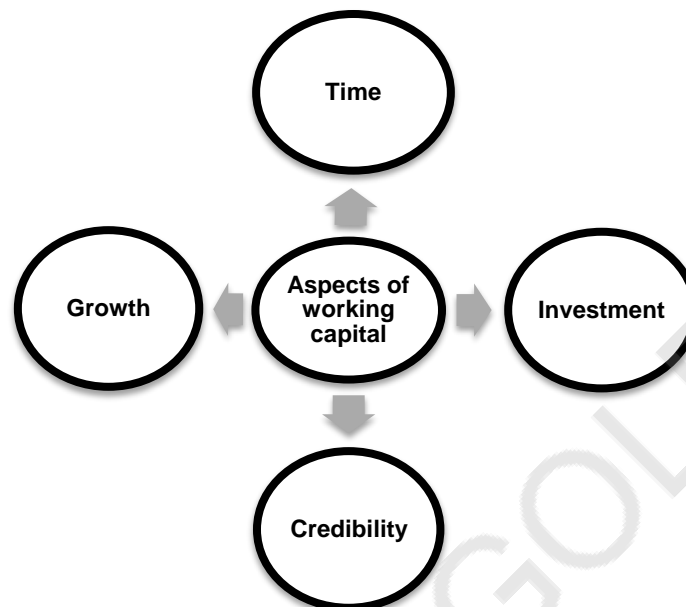
Hence, working capital levels are said to be adequate when:

- Current Assets are greater than Current Liabilities.
- Current Ratio = Current Assets / Current Liabilities is about 2: 1. This may differ from industry to industry.
- Quick Ratio = Quick Assets / Quick Liabilities is at least 1: 1. This may also differ from industry to industry.

## 4 Aspects Of Working Capital Management

Working Capital management entails the control and monitoring of all components of working capital, i. e. cash, marketable securities, debtors (receivables) and stocks (inventories) and creditors (payables). The finance manager has to determine the levels and composition of current assets. He has to ensure a right mix of different current assets and that current liabilities are paid in time.

There are many **aspects of working capital management** which makes it an important function of financial management.



- **Time:** Working capital management requires much of the finance manager's time.
- **Investment:** Working capital represents a significant portion of the total investment in assets.
- **Credibility:** Working capital management has great significance for all firms and it is very critical for small firms.
- **Growth:** The need for working capital is directly related to the firm's growth

**Current Assets to Fixed Assets Ratio:** The finance manager is required to determine the optimum level of current assets so that the shareholders' value is maximized. A firm need fixed and current assets to support a particular level of output. However, to support the same level of output, the firm can have different levels of current assets.

The level of the current assets can be measured by creating a relationship between current assets and fixed assets. Dividing current assets by fixed assets gives **current assets / fixed assets** ratio.

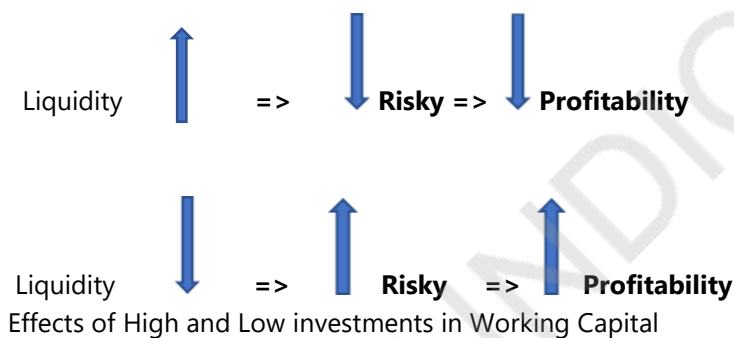
- Assuming a constant level of fixed assets, a higher current assets / fixed assets ratio indicates a **conservative current assets policy**.
- A lower current assets / fixed assets ratio means an **aggressive current assets policy** assuming all factors to be constant.
- A **conservative** policy implies **greater liquidity** and **lower risk** whereas an **aggressive** policy indicates **higher profitability** with **higher risk** and **poor liquidity**. Moderate current assets policy will fall in the middle of conservative and aggressive policies. The current assets policy of most of the firms may fall between these two extreme policies.



***It is advisable that the finance manager should take precautionary measures for effective and efficient management of working capital. He has to pay particular attention to the levels of current assets and their financing. To decide the levels and financing of current assets, the risk return trade off must be considered.***

**Risk return trade off** – A firm may follow a conservative, aggressive or moderate policy as discussed above. However, these policies involve risk, return tradeoff. A conservative policy means lower return and risk. While an aggressive policy produces higher return and risk.

The two important aims of the working capital management are **profitability** and **solvency**. A liquid firm has less risk of insolvency that is, it will hardly experience a cash shortage or a stock out situation. However, there is a cost associated with maintaining a sound liquidity position. However, to have higher profitability the firm may have to sacrifice solvency and maintain a relatively low level of current assets. This will improve firm’s profitability as fewer funds will be tied up in idle current assets, but its solvency would be threatened and exposed to greater risk of cash shortage and stock outs.



Particulars	High	Low
Inventory (JIT, EOQ)	→ More capital → Less Stock out Risk	→ Less Capital Req. → More stock out risk
Receivables (credit Policy, Discount Policy, Factoring)	→ More sales → More Bad Debts	→ Less attractive Sales → Quick Cash Realization.
Prepaid Expenses (Cost Benefit analysis)	→ More Blockage of funds. → Advantages in Inflationary conditions.	→ Less Blockage of Funds. → Utilization for alternative investments.
Cash (cash Budget)	→ No threat for creditors → Increase in Goodwill	→ Threat for creditors → Utilization of funds for alternative investments.
Payables	→ Availability of high capital → Which can be utilised for investments	→ Easily addressable financial obligation resulting in Goodwill

### Illustration

A firm has the following data for the year ending 31<sup>st</sup> March 2011:

	Rs.
Sales (1,00,000@ Rs. 20/-)	20,00,000
Earnings before Interest and Taxes	2,00,000
Fixed Assets	5,00,000

The three possible current assets holdings of the firm are Rs. 5,00,000/-, Rs. 4,00,000/- and Rs. 3,00,000/-. It is assumed that fixed assets level is constant, and profits do not vary with current assets levels. The effect of the three alternative current assets policies is as follows:

### Effects of Alternative Working Capital

Working Capital Policy	(Amount in Rs)		
	Conservative	Moderate	Aggressive
Sales	20,00,000	20,00,000	20,00,000
Earnings before Interest and Taxes (EBIT)	2,00,000	2,00,000	2,00,000
Current Assets	5,00,000	4,00,000	3,00,000
Fixed Assets	5,00,000	5,00,000	5,00,000
Total Assets	10,00,000	10,00,000	8,00,000
Return on Total Assets (EBIT /Total Assets)	20%	22.22%	25%
Current Assets / Fixed Assets	1.00	0.80	0.60

The approaches to financing working capital requirements are:

Name of Approach	Matching Approach	Conservative Approach	Aggressive Approach
Long Term Funds Used in	Fixed Assets and Permanent Working Capital.	Fixed Assets, Permanent Working Capital and part of Temporary Working Capital.	Fixed Assets and part of Permanent Working Capital.
Short Term funds used in	Temporary Working Capital.	Balance of Temporary Working Capital.	Balance of temporary working capital.
Impact on Liquidity	Comparatively well - Balanced	High Liquidity	Low liquidity.
Impact on Profitability	Comparatively well – Balanced.	Low Profitability and return on assets.	High Return on assets but Risky.

The aforesaid calculations show that the conservative policy provides greater liquidity (solvency) to the firm, but lower return on total assets. On the other hand, the aggressive policy gives higher return, but low liquidity and thus is very risky. The moderate policy generates return higher than Conservative policy but lower aggressive policy. This is less risky than Aggressive policy but more risky than conservative policy.

In determining the optimum level of current assets, the firm should balance the profitability - Solvency tangle by minimizing total costs, Cost of liquidity and cost of illiquidity.

## 6 Estimating Working Capital needs

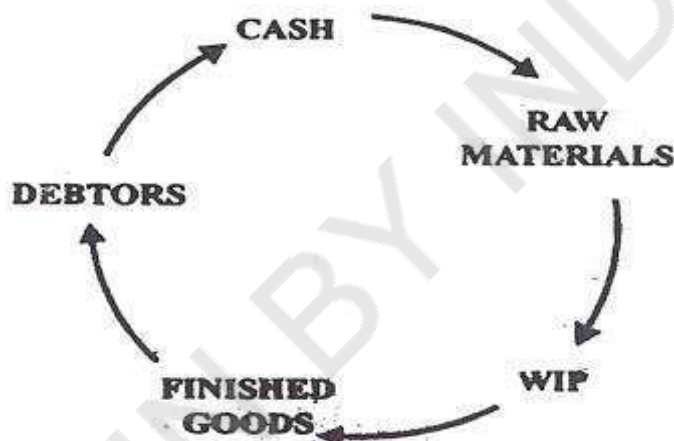
Operating cycle is one of the most reliable method of Computation of Working Capital. However, other methods like ratio of sales and ratio of fixed investment may also be used to determine the Working Capital requirements. These methods are briefly explained follows as:

- i. **Current assets holding period:** To estimate working capital needs based on the average holding period of current assets and relating them to costs based on the company's experience in the previous year. This method is essentially based on the Operating Cycle Concept.
- ii. **Ratio of sales:** To estimate working capital needs as a ratio of sales on the assumption that current assets change with changes in sales.
- iii. **Ratio of fixed investments:** To estimate Working Capital requirements as a percentage of fixed investments.

A number of factors will, however, be impacting the choice of method of estimating Working Capital. Factors such as seasonal fluctuations, accurate sales forecast, investment cost and variability in sales price would generally be considered. The production cycle and credit and collection policies of the firm will have an impact on Working Capital requirements. Therefore, they should be given due weightage in projecting Working Capital requirements.

### 6.1 Importance of Working Capital Cycle/Operating Cycle/Cash cycle

**Meaning:** Working Capital Cycle or Cash Cycle or Operating Cycle is the **time duration for conversion of cash into cash equivalents like Raw Materials, Work-in-Progress, Finished Goods, sundry Debtors and thereafter back into cash.**



Representation of the Operating Cycle

**Segments:** The operating cycle has the following phases or segments:

- Conversion of Cash into Raw Materials - **Lead Time**
- Conversion of Raw Materials into WIP and then WIP into Finished Goods – **Production / Process Cycle**
- Conversion of Finished Goods into Debtors through Sales - **Stockholding Period**
- Conversion of Receivables into Cash - **Average Collection Period**

**Computation:** Operating Cycle is computed in terms of number of days (or sometimes in months), It is computed as under:

### Gross Operating Cycle

= Raw Material Storage Period + WIP Conversion Period + Finished Goods Holding Period + Debtors Collection Period.

### Net Operating Cycle

= [Raw Material Storage Period + WIP Conversion Period + Finished Goods Holding Period + Debtors Collection Period] – Creditors Payment Period

Components	Formula	Formula based on Turnover	Related Formula
Raw Materials Storage Period	$\frac{\text{Average Stock of Raw Materials}}{\text{Average Cost of RM per Day}}$	$\frac{365}{\text{RM Turnover Ratio}}$	$\text{RM Turnover Ratio} = \frac{\text{Total cost of Consumption p.a}}{\text{Average Stock of RM}}$
WIP Conversion Period	$\frac{\text{Average Stock of WIP}}{\text{Average Cost of production per day}}$	$\frac{365}{\text{WIP Turnover Ratio}}$	$\text{WIP Turnover} = \frac{\text{Total cost of production p.a}}{\text{Average Stock of WIP}}$
Finished Goods Holding Period	$\frac{\text{Average Stock of Finished Goods}}{\text{Average Cost of Goods sold per day}}$	$\frac{365}{\text{FG Turnover Ratio}}$	$\text{FG Turnover} = \frac{\text{Total cost of goods sold p.a}}{\text{Average Stock of FG}}$
Debtors Collection Period	$\frac{\text{Average Accounts Receivables}}{\text{Average Credit Sales Per day}}$	$\frac{365}{\text{Debtors Turnover Ratio}}$	$\text{Debtors Turnover} = \frac{\text{Total Credit sales p.a}}{\text{Average Debtors}}$
Creditors Payment Period	$\frac{\text{Average Accounts Payable}}{\text{Average Credit Purchase Per day}}$	$\frac{365}{\text{Creditors Turnover Ratio}}$	$\text{Creditors Turnover} = \frac{\text{Total Credit Purchases p.a}}{\text{Average Creditors}}$

**Note:** The average figure in Turnover ratios is calculated by Average of opening and closing Balance. If opening balance is not available, then only closing balance can be taken as Avg. (assuming Opening bal. = Closing bal.)

### Significance Of Working Capital Cycle

1. **Control the time lag in processes:** proper monitoring of working capital cycle points out the excess time taken by various processes which ultimately affects the working capital needs.
2. **Surplus Generation:** It represents the activity cycle of the business, i.e. purchase, manufacture, sales and collection thereof. Hence the operating cycle stands for the process that creates surplus or profit for the business.
3. **Funds Rotation:** Operating cycle indicates the total time required for rotation of funds the faster the funds rotate, the better it is for the Company.
4. **Going Concern:** Cash cycle lends meaning to the going concern concept. If the cycle stops in between, the going concern assumption may, be violated.

Hence, Working Capital Cycle should be on par with the industry average. A long cycle indicates overstocking of inventories or delayed collection of receivables and is considered unsatisfactory.

Using the Operating Cycle, the Working Capital Turnover can also be computed as  $365/\text{Working Capital Cycle}$ . A high turnover ratio indicates a better position.

### 6.2 Approaches to estimation of Working Capital Requirements

Working Capital Requirements can be forecast in two Methods:

→ By reference to the Operating Cycle (based on time)

Networking Capital =

$$\frac{\text{Total yearly operating expenses} \times \text{operating cycle}}{12 \text{ months or } 365 \text{ days}}$$

→ By estimation of each component of Current assets and Current liabilities (based on value)

The two approaches to estimation of working capital requirements based on value are:

- 1) **Total Approach** - Total amount of current assets and current liabilities are considered. It means, even non-cash expenses like depreciation and profit margins are included in the valuation of current assets.
- 2) **Cash Cost Approach** - This approach is based on the fact that actual amount of funds blocked in current assets are less than their total value in the books. Only Cash expenses (excluding depreciation) are included. Profit margins and depreciation are excluded from receivables and inventory.

### 6.2.1 Estimations Of Current Assets

The estimates of various components of working capital may be made as follows (Based on **value blocked for the holding periods**):

S.No	Total Approach	Cash Cost Approach
1	<p><b>Raw materials inventory (RM):</b> The funds to be invested in raw materials inventory may be estimated on the basis of production budget, the estimated cost per unit and average holding period of raw material inventory by using the following formula:</p> $\left\{ \frac{\text{Estimated production} \times \text{Estimated cost raw material per unit (in units)}}{12 \text{ months or 52 weeks or 360 days}} \right\} \times \text{Average RM holding period (months / weeks / days)}$	Same
2	<p><b>Work-in-progress inventory:</b> The funds to be invested in work-in-progress can be estimated by the following formula:</p> $\left\{ \frac{\text{Estimated production} \times \text{Estimated work-in-progress cost per unit (in units)}}{12 \text{ months or 52 weeks or 360 days}} \right\} \times \text{Average holding period of WIP (months / weeks / days)}$	In the same formula, Depreciation is excluded from production overhead.
3	<p><b>Finished Goods (FG):</b> The funds to be invested in finished goods inventory can be estimated with the help of following formula:</p> $\left\{ \frac{\text{Estimated production} \times \text{Cost of Production per unit (in units)}}{12 \text{ months or 52 weeks or 360 days}} \right\} \times \text{FG holding period (months / weeks / days)}$	In the same formula, Depreciation is excluded from cost of production.
4	<p><b>Debtors:</b> Funds to be invested in trade debtors may be estimated with the help of following formula:</p> $\left\{ \frac{\text{Estimated Credit Sales} \times \text{Selling Price (in units)}}{12 \text{ months or 52 weeks or 360 days}} \right\} \times \text{Average debtor's collection period (months / weeks / days)}$	In the same formula, profit margin and Depreciation are excluded from selling price.
5	<p><b>Minimum desired Cash and bank balances</b> to be maintained by the firm has to be added in the current assets for the computation of working capital.</p>	same

### 6.2.2 Estimation of Current Liabilities

Current liabilities generally affect computation of working capital. Hence, the amount of working capital is lowered to the extent of current liabilities (other than bank course of business. The important current liabilities like trade overheads can be estimated as follows:

(Based on **value payable for the delayed periods**)

i. Trade Creditors:

$$\left\{ \frac{\text{Estimated Yearly Purchase} \times \text{Raw material cost per unit (in units)}}{12 \text{ months or 52 weeks or 360 days}} \right\} \times \text{Credit period granted by suppliers (months / weeks / days)}$$



ii. Direct Wages:

$$\left\{ \frac{\text{Estimated production X Direct labour cost per unit (in units)}}{12 \text{ months or 52 weeks or 360 days}} \right\} \times$$

Average time lag in payment of wages (months / weeks / days)

iii. Overheads (other than depreciation and

$$\left\{ \frac{\text{Estimated Yearly Production X Overhead cost per unit (in units)}}{12 \text{ months or 52 weeks or 360 days}} \right\} \times$$

Average time lag in payment of overheads (months /

amortization):

**Certain Points to Remember**

- ✓ The amount of overheads may be separately calculated for different types of overheads. In case of selling overheads, the relevant item would be Sales Volume instead of Production Volume.
- ✓ Estimation of current liabilities remain the same under total and cash cost approach.
- ✓ If Payment is received in Advance, the item shall appear as a Current Liability.
- ✓ In the case of selling overheads, the yearly SALES volume is considered but **NOT** yearly **PRODUCTION**.
- ✓ **Depreciation Expense:** An important point in estimating the working capital requirement is the depreciation on fixed assets. The depreciation on fixed assets is not considered in Working Capital requirements. Depreciation is a non-cash expense and hence no funds are locked up in depreciation. Hence, it is ignored in the calculation of WC Estimation. Depreciation is neither included in Valuation of WIP, nor is it included in the Valuation of Finished Goods. Working Capital that is calculated by ignoring depreciation is known as "Cash Cost Working Capital." In the rarest cases, if depreciation is included in the WC Calculations, such estimate of WC is known as "Total Cost Working Capital." Unless specified otherwise, we always use CASH COST, for estimation of Working Capital.

6.3 Effect of "Double Shift Working" On Working Capital Requirements

The greatest economy in introducing double shift is the greater use of fixed assets. As the firm increases the number of production hours, working capital requirements also increase, however, the increase in working capital may not be directly proportional to the increase in the number of hours and other factors. Let's see the impact of double shift on some of the components of working capital:

Sr.No	Item	Effect On Quantity	Effect on Rate
1	<b>Raw Materials</b>	Stock requirements may double. Since consumption per day will be twice as earlier.	Due to BULK Purchases, the firm may be able to avail Quantity Discounts. Hence, the average cost per unit of Raw Material may be reduced.
2	<b>Work-In-Progress</b>	There will be no change in the quantity of WIP, Since work commenced in the first shift, will be completed in the second shift. Hence at the end of any day the	Due to reduction in Raw Material Cost per unit and the economies of Fixed Costs, the average

		quantity of WIP will remain the same as it was, in Single Shift Working.	cost per unit of WIP may be reduced.
3	<b>Finished Goods</b>	Due to Greater Production, Finished good stocks <u>may double</u> in quantity.	Cost of Production per unit will be reduced, due to lower cost of materials & economies of fixed costs.
4	<b>Sundry Debtors</b>	Increase in Demand and increased Sales will lead to Higher amount of Debtors for the same credit period. In case of reduction in credit period, the increase may not be proportional or double.	Selling price may be reduced on account of price Elasticity of Demand. Additional Quantities could be sold only by reducing the prices.
5	<b>Sundry Creditors</b>	Raw Material purchase quantity and creditors may double, subject to the credit period offered by creditors remaining the same. In case of extended credit period, the $\uparrow$ in creditors may be more than proportional or even more than double.	Better due to bulk Purchase and bargaining Power, the Firm may obtain discounts. Hence, the amount payable per unit of purchased might stand reduced.

### 1 Treasury Management

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Treasury Management refers to efficient management of liquidity (Working Capital) and financial risk in business. The **responsibilities** of Treasury Management include:

- a) Management of Cash, while obtaining the optimum return from surplus funds;
- b) Management of foreign exchange rate risks, in accordance with the Company policy;
- c) Providing long-term and short-term funds as required by the business, at the minimum cost;
- d) Maintaining good relationship and liaison with financiers, lenders, bankers and investors (shareholders); and
- e) Advising on various issues of corporate finance like capital structure, buy-back, mergers, acquisitions, disinvestments etc.

#### 1.1 Functions of Treasury Management

The responsibilities of the Treasury Department are discharged through its functions. These are as under:

- a) **Cash Management:** This involves aspects such as:
  - Planning or forecasting future cash requirements through Cash Budgets.
  - Efficient collection of receivables and payment of liabilities through float management.
  - Monitoring of funds position at various divisions / branches and identifying surplus or idle funds to transfer them to other divisions.
  - Investment planning or parking of surplus funds in marketable securities to optimize return.
  - Centralization of collections and release of funds to various divisions.
- b) **Currency Management:** This involves aspects such as:
  - Managing the foreign currency risk exposure through hedging or forward or futures.
  - Timely settling or setting off of intra-group indebtedness when there are divisions in various countries.
  - Matching transactions of receipts and payments in the same currency to save transaction costs.
  - Decision on currency to be used while invoicing export sales.
- c) **Fund Management:** This involves aspects such as:
  - Planning of long-term, medium-term and short-term cash needs.
  - Participation in decisions concerning capital structure, dividend payout etc.
  - Obtaining the fund requirements from various sources like bank loans, public issues etc.
- d) **Banking Liaison:** This involves aspects such as:
  - Maintaining cordial and good relationships with bankers, lending institutions and financiers.
  - Coordinating, liaising and negotiating with the lenders during obtaining finance.
- e) **Corporate Finance:** This involves aspects such as:
  - Advising on various issues such as buy-back, mergers, acquisitions and divestments.
  - Capital Market Intelligence - obtaining information on market trend, timing of public issue etc

### 2 Cash Management

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#### 2.1 Important Areas of Cash Management

The Finance Manager should consider the following important areas of Cash Management:

- (a) To ensure that sufficient cash is available at each division or section for routine operations.
- (b) To ensure liquidity in all divisions of the organization.

- (c) To identify surplus funds in certain divisions and transfer them to other divisions requiring them.
- (d) To invest surplus or idle funds in marketable securities in order to optimize return on funds.

## 2.2 Basic needs or Considerations for Holding Cash

According to Lord Keynes, the basic considerations in determining the amount of cash or liquidity are:

- (a) **Transaction or Operation Needs:** Cash may be held sufficiently in order to meet day-to-day expenses, repayments, commitments etc. In case the forecast receipts or inflows do not arise as planned, the reserve cash balance will be available for meeting payment commitments.
- (b) **Speculative or Investment Needs:** Cash may be held in order to take advantage of profitable opportunities that may crop up. e.g., purchase of materials in bulk in case of temporary fall in price. Otherwise, such opportunities may be lost for want of ready cash.
- (c) **Precautionary or Safety Needs:** Cash may be held in order to provide safety against unexpected events and payments. Sufficient cash holding gives a sense of security or safety to the firm.

### Cash Budgets

Cash Budgets are a tool for forecasting short-term cash requirements of an enterprise. They provide a blueprint of the cash inflows and outflows that are expected to occur in the immediate future period. They assist the management in determining the surplus or shortage of funds and to take suitable action.

Cash Budgets are generally prepared in the following format, for short periods, say month by month:

Particulars	Amount
<b>a. Opening Balance of Cash</b>	
<b>b. Cash Inflows or Receipts:</b>	
<ul style="list-style-type: none"> <li>➤ Cash Sales</li> <li>➤ Receipts from Debtors</li> <li>➤ Other Revenue Receipts</li> <li>Capital Receipts (to be specified)</li> <li>➤ Sales of fixed assets / investments</li> <li>Issue of shares / debentures / bonds / loan taken</li> </ul>	
<b>C. Cash Outflows or Payments:</b>	
<ul style="list-style-type: none"> <li>➤ Payment to Creditors for Goods</li> <li>➤ Expenses and To Creditors for Services</li> <li>➤ Other payments, which occur periodically like debenture interest, advance tax, dividend, sales tax etc.</li> <li>➤ Capital Expenditures / purchase of fixed assets, Purchase of investments</li> <li>➤ Repayment of Loans / redemption of shares / debentures</li> </ul>	

<b>d. Surplus or Shortage = b – c =Inflows less Outflows</b>	
<b>e. Closing Balance of Cash = a + d =Opening Balance + Surplus</b>	

### 2.3 Distinguish between Cash Flow Statements and Cash Budgets

<b>Basis of differences</b>	<b>Cash Flow Statement</b>	<b>Cash Budgets</b>
<b>Meaning</b>	It is a statement which shows the manner in which funds (cash) has been utilized in Operational, Investing and Financing Activities.	It is a statement, which shows the plans for receipt and utilization of which for a certain future period of time.
<b>Time Period</b>	It can be prepared either for a past financial period or projected into the future.	It is essentially a future-oriented statement. There is no Cash Budget for a past period
<b>Purposes</b>	<ul style="list-style-type: none"> <li>• Analysis of cash investments for past period.</li> <li>• Compliance with statutory requirements. where AS - 3 is applicable</li> <li>• Cash forecasting purpose, when prepared for future periods.</li> </ul>	<ul style="list-style-type: none"> <li>• The purpose is primarily to serve internal management for forecasting future cash requirements, identifying cash surplus and shortage in future, short-term investment decisions etc.</li> </ul>
<b>Format</b>	When statutory disclosure is required, Cash Flow Statements should conform to AS-3	There is no specified mandatory format for Cash Budgets as it is purely an internal document used for budgeting purposes.

### 2.4 MANAGEMENT OF CASH COLLECTION & DISBURSEMENTS

Having prepared the cash budget, the finance manager should ensure that there is not a significant deviation between projected cash flows and actual cash flows.

To achieve this cash management, efficiency will have to brought in by proper control of cash collection and disbursement.

The twin objectives in managing cash flow should be:

- Accelerate cash collections as much as possible; and
- Decelerate or delay cash disbursements within permissible time frame.

#### **Concept of Float**

The term "float" denotes a delay or lag between two events. In financial world float means the time taken to realize in cash.

### 2.4.1 TYPES OF FLOATS IN THE CONTEXT OF CASH MANAGEMENT

The term float is usually used for the following delays

Delay on;	Name of float
Dispatch of Finished Goods to Customer	Billing Float
Preparation of Bill or Invoice	Mailing Float
Payment of amount due under the invoice	Credit Period
Receipt of Cheque (by the Seller)	Mailing Float
Deposit of Cheque into Bank	Cheque Processing Float
Credit of Cheque by Bank	Banking Processing Float

To convert receivables into cash quickly, all the floats have to be reduced to the minimum. While credit period is considered as a policy decision, all other floats can be reduced by judicious managerial action.

### 2.4.2 Measures for Reducing various management of Floats in Cash

Some measures to reduce the float management in cash management are:

Delay on;	Name of float
Billing Float	Immediate preparation of bill, on the date of dispatch of goods
Mailing Float - in sending invoice to customer	Use of faster modes of mailing, including e-mail. Sending the invoice by fax first, followed by normal mail.
Mailing Float - receipt of cheque from customer Cheque Processing Float Banking Processing Float	Concentration Banking and Lock Box System.

## 2.5 Concentration Banking

**Procedure:** This method of collection from customers operates as under:

- Identify locations or places where major customers are placed, i.e., a Company with Head Office at Chennai and customers based in Delhi, Kolkata and Mumbai.
- Open a Local Bank Account in each of these locations i.e., Delhi, Kolkata and Mumbai.
- Open a local collection center for receiving cheques from these customers at the respective places. A Branch Office or even an Agent can perform the role of a Collection Centre.
- Collect remittances from customers locally, either in person or through post.
- Deposit the cheques received in the local bank account for clearing.
- Transfer the funds to Head Office Bank Account, upon realization of cheques.



Actually the cash management tools/ techniques like lock box system and Concentration Banking are less relevance now, on looking in practice perspective. Since now using the internet banking and other real time payment systems like UPI or IMPS.

### 2.5.1 Advantages

- Reduction in Mailing Float:** Since remittances from customers are collected locally either in person or by local post / courier, mailing float is reduced substantially.
- Reduction in Banking Processing Float:** Cheques are cleared locally, and the funds are made available faster. There need not be any waiting time for clearance of outstation cheques.

- **Centralized Cash Management:** As surplus funds are transferred to Head Office Concentration Bank Account, idle funds in various locations are avoided. Centralized Cash Management ensures optimum use of funds available to the company and enables payment planning.

## 2.6 Lock Box System

**Procedure:** This method of collection from customers operates as under:

- Identify locations or places where major customers are placed i.e., a Company with Head Office at Chennai and customers based in Delhi, Kolkata and Mumbai.
- Open a Local Bank Account in each of these locations in Delhi, Kolkata and Mumbai.
- Instruct customers to mail their payments to the Local post Box. The invoice may carry Instructions like "Mail your payment to Corporation Bank A/c No. 157483 P O Box No. 083, Andheri Branch, Mumbai.
- Authorize the Bank to pick up remittances from local post box.
- Authorize the Bank to realize the cheques through local collection / clearing.
- Transfer the funds to Head Office Bank Account, on clearance of cheques.

### 2.6.1 Advantages

- **Reduction in Mailing Float:** Since remittances from customers are collected locally either in person or by local post / courier, mailing float is reduced substantially.
- **Reduction in Cheque Processing Float:** The Bank would prepare a list of remittances received and forward it to the Company as a Credit Advice. This saves cheque processing float at the Company's office, prior to collection.
- **Centralized Cash Management:** Since surplus funds are transferred to Head Office Bank Account, idle funds in various locations are avoided. Centralized Cash Management ensures optimum use of funds available to the company and enables payment planning.

## 3 Cash Management Models

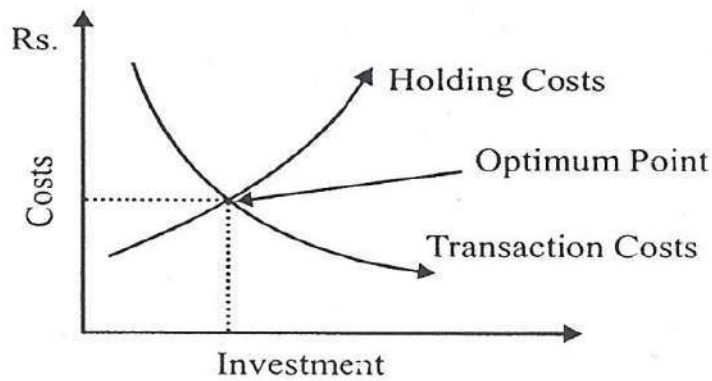
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- There are several mathematical models, which help to determine the optimum cash balance to be carried by a firm, at any given point of time.
- The major objective of these models is to ensure that cash does not remain idle with the firm and at the same time it is not confronted with cash shortage.
- The models can be broadly divided into two categories:
  - Inventory Type Models - Cash flows are expected to arise uniformly, day-by-day, during the year.
  - Stochastic Models - Cash flows are expected to be uneven and different on various dates.

### 3.1 William J. Baumol's EOQ model for optimum cash balance

William J. Baumol developed a model for optimum cash balance which is normally used in inventory management. The Baumol model on Optimum Cash Balance is similar to Wilson's model on raw material EOQ. The optimum cash balance is the trade-off between cost of holding cash (opportunity cost of cash held) and the transaction cost (i.e. cost of converting marketable securities in to cash). Optimum cash balance is reached at a point where the two opposing costs are equal and where the **total cost is minimum**. This can be explained with the following diagram:

## Diagrammatic Representation :



**Assumptions:** The Optimum Cash Balance model is based on the following assumptions:

(a) **Uniform Cash**

**Flows:** Cash payments arise uniformly during a year. For example, if the total annual cash outflow is Rs. 36,00,000 and there are 300 working days, the average payment per day = Rs. 36,00,000 / 300 days = Rs. 12,000 per day.

- (b) **Fixed Transaction Costs:** Surplus cash can be invested in short-term marketable securities. However, for every purchase of securities (i.e., investments) and for every sale (i.e. disposal of investments), fixed transaction costs are incurred e.g. brokerage, registration costs, clerical expenses etc. Hence, these costs rise along with the number of transactions (i.e., purchase and sale of securities)
- (c) **Fixed Holding Costs.:** Surplus cash, if held by the firm, entails loss of interest at a fixed rate. This constitutes the carrying costs of cash, i.e. the interest foregone on marketable securities.
- (d) **Free marketability:** Short-term instruments can be freely traded. The firm can invest them at any time and sell off / dispose investments at any time.

### Formula:

$$\text{Optimum Investment Size} = \sqrt{\frac{2AT}{I}}$$

where

A = Annual Cash Requirements

T = Costs per Transaction

I = Interest rate, i.e. Carrying Cost per rupee of Cash

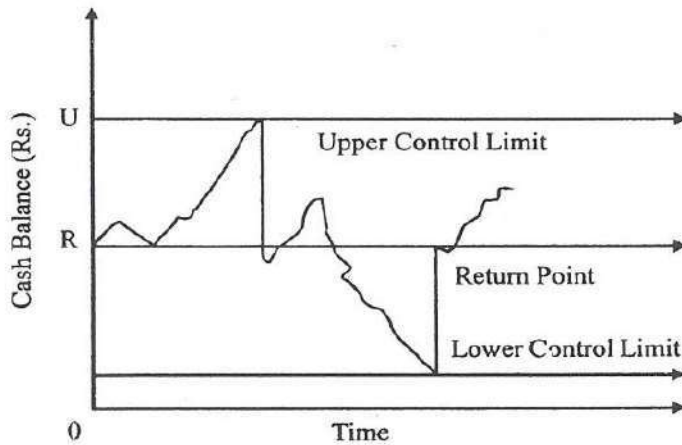
### 3.1.1 Limitations Of Baumol Model

The limitation of the Baumol's model is that it does not allow the cash flows to fluctuate. Firms in practice do not use their cash balance uniformly nor they are able to predict daily cash inflows and outflows. The Miller-Orr (MO) model overcomes this shortcoming and allows for daily cash flow variation.



### 3.2 Miller-Orr Cash Management Model

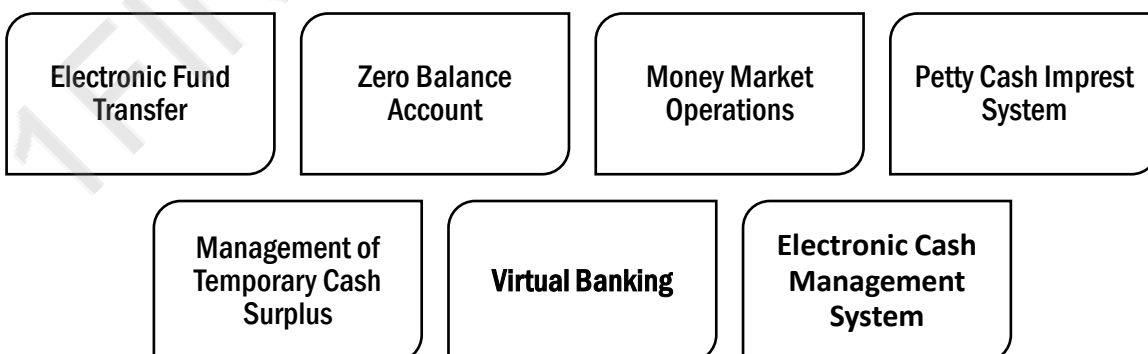
**Stochastic Cash Flow Assumption:** Under this model, cash payments are presumed at different amounts on different days, i.e., stochastic. In practice, the payment flow is not uniform. For example, wage and salary payment arises in the first week, telephone bills fall due for payment once in a month, etc. With this assumption, this model is designed to determine the time and size of transfers between an investment account and cash account.



**Theory:** This model operates as under:

- Cash outflows are not uniform during the year.
- Upper and lower limits can be fixed for cash balances, as outflows do not exceed a certain limit on any day. These limits are determined based on fixed transaction costs, interest foregone on marketable securities and the degree of likely fluctuations in cash balances.
- When cash balance reaches the upper limit, surplus cash is invested in marketable securities, to bring down the cash balance to the average limit or return point.
- When cash balance touches the lower limit, investments (marketable securities) are disposed of so that cash balances go up to the average limit or return point.
- During the period when cash balance stays between high and low limits, there are no transaction between cash and marketable securities.

## 4 Recent Developments in Cash Management



Now-a-days, electronic delivery and payment system are becoming increasingly important because of increased competition and the demand for more efficient and convenient capabilities. A considerable number of transactions and amounts of funds can be moved electronically from one place to another almost instantaneously. Therefore, we can easily observe the rapid transition from the most basic and traditional principles to now complex strategies dominated by the technology and globalization, but the basic goal is same i.e. the efficient utilization of cash in a way which is consistent with the overall strategic objectives of a business unit.

- (a) **Electronic Fund Transfer:** With the developments which took place in the information technology, the present banking system is switching over to the computerization of banks branches to offer efficient banking services and cash management services to their customers. The network will be linked to the different branches, banks. This will help the customers in the following ways:
- **Instant updating of accounts**
  - **The quick transfer of funds.**
  - **Instant information about foreign exchange rates.**
- (b) **Zero Balance Account:** For efficient cash management some firms employ an extensive policy of substituting marketable securities for cash by the use of zero balance accounts. Every day the firm totals the cheques presented for payment against the account. The firm transfers the balance amount of cash in the account if any, for buying marketable securities. In case of shortage of cash, the firm sells the marketable securities.
- (c) **Money Market Operations:** One of the tasks of '*treasury function*' of larger companies is the investment of surplus funds in the money market. The chief characteristic of money market banking is one of size. Banks obtain funds by competing in the money market for the deposits by the companies, public authorities, High Net worth Investors (HNI), and other banks, Deposits are made for specific periods ranging from overnight to one year, a highly competitive rates which reflect supply and demand on a daily, even hourly basis are quoted
- (d) **Petty Cash Imprest System:** For better control on cash, generally the companies use petty cash imprest system wherein the day-to-day petty expenses are estimated considering past experience and future needs and generally a week's requirement of cash will be kept separate for making petty expenses.
- (e) **Management of Temporary Cash Surplus**  
Temporary cash surpluses can be profitably invested in the following:
- ✓ Short-term deposits in Banks and financial institutions.
  - ✓ Short-term debt market instruments.
  - ✓ Long-term debt instruments.
  - ✓ Shares of Blue-chip listed companies.
- (f) **Electronic Cash Management System:** Most of the cash management systems now-a-days are electronically based, since 'speed' is the essence of any cash management system. Various elements in the process of cash management are linked through a satellite. Various places that are interlinked may be the place where the instrument is collected, the place where cash is to be transferred in company's account, the place where the payment is to be transferred etc.
- (g) **Virtual Banking:** Customers are increasingly moving away from the confines of traditional branch banking and are seeking the convenience of remote electronic banking services. And even within the broad spectrum of electronic banking the virtual banking has gained prominence.

Broadly **virtual banking denotes the provision of banking and related services through extensive use of information technology without direct recourse to the bank by the customer.** The origin of virtual banking in the developed countries can be traced back to the seventies with the installation of Automated Teller Machines (ATMs). Subsequently, driven by the competitive market environment as well as various technological and customer pressures, other types of virtual banking services have grown in prominence throughout the world.

The Reserve Bank of India has been taking a number of initiatives, which will facilitate the active involvement of commercial banks in the sophisticated cash management system. One of the pre-requisites to ensure faster and reliable mobility of funds in a country is to have an efficient payment system.

Introduction of computerized settlement of clearing transactions, use of Magnetic Ink Character Recognition (MICR) technology, provision of inter-city clearing facilities and high value clearing facilities, Electronic Clearing Services Scheme (ECSS), Electronic Funds Transfer (EFT) scheme, Delivery vs. Payment (DVP) for Government securities transactions, setting up of Indian Financial Network (INFINET) are some of the significant developments. Introduction of Centralized Funds Management System (CFMS), Securities Services System (SSS), Real Time Gross Settlement System (RTGS) and Structured Financial Messaging System (SFMS) are the other top priority items on the agenda to transform the existing system into a state-of-the-art payment infrastructure in India.

#### 4.1 The Advantages of Virtual Banking Services.

- **Lower cost** of handling a transaction
- The increased **speed** of response to customer requirements
- The **lower cost of operating branch network** along with reduced staff costs leads to cost efficiency
- Virtual banking allows the possibility of **improved and a range of services** being made available to the customer rapidly, accurately and at his convenience.

# Chapter 9

## Unit 4 - Management of Receivables

### 1 Introduction

The basic objective of management of sundry debtors is to optimize the return on investment on these assets known as **receivables**. Large amounts are tied up in sundry debtors, there are chances of bad debts and there will be cost of collection of debts. On the contrary, if the investment in sundry debtors is low, the sales may be restricted, since the competitors may offer more liberal terms. Therefore, management of sundry debtors is an important issue and requires proper policies and their implementation.

#### 1.1 Importance of Proper Management of Sundry Debtors

**High Investment:** If large amounts are tied up in sundry debtors, working capital requirements and consequently interest charges will be high. Also, bad debts and cost of collection of debts would be high.

**Low Investment:** If the investment in sundry debtors is low, the sales may be restricted, since the competitors may offer more liberal credit term.

Hence, management of sundry debtors is an important issue and requires proper policies and efficient execution of such policies.

#### 1.2 Cost of Maintaining Receivables

The cost of maintaining receivables comprises the following:

- (i) **Interest on Investment:** Additional funds are blocked in receivables. This involves cost in the form of interest (in case of loan funds) or opportunity cost of capital (in case of own funds).
- (ii) **Administrative Costs:** Costs of record keeping, investigation of credit worthiness etc.
- (iii) **Delinquency Costs:** Costs of reminders, phone calls, follow-up letters etc.
- (iv) **Collection Costs:** Cost of contacting customers, collecting cheques in person, outstation collection charges, etc.
- (v) **Defaulting Costs:** Bad debts, legal charges in respect of suits pending against debtors etc.
- (vi) **Credit worthiness analysis costs** – whether customer should be granted credit or not.
- (vii) **Cash Discount**

Note: These costs are compared with benefits, i.e. Additional Contribution, in the evaluation of credit period or credit policy,

#### **Calculation of Opportunity Cost**

##### **Formula**

$$\text{Opportunity Cost} = \frac{\text{Annual Investment}}{12} \times \text{Credit Period} \times \text{Rate of Opportunity Cost}$$

##### **Terms Used**

Annual Investment = Annual Variable Cost + Annual Fixed Cost

##### **Important Points**

- Opportunity cost may be calculated on variable cost only or sales. Whatever options you choose write a note in examination.
- Opportunity cost is calculated w.r.t. operating cost/cost of production.

## 2 Aspects Of Management of Debtors

The three basic aspects of management of sundry debtors are:

- (A) **Credit Policy** - decisions on credit period to be allowed
- (B) **Discount Policy** - decisions on discount to be allowed
- (C) **Factoring** – Trade - off between Factoring cost & Control over Receivables

### 2.1 Credit Policy

**Credit Policy:** This involves decisions relating on the following aspects of credit:

- (i) Length of the credit period;
- (ii) Discount Policy;
- (iii) Other special items.

**Role:** The credit policy determines the investment in sundry debtors, average collection period and bad debt losses. Hence, credit policy of a firm should enable it to achieve the following objectives:

- (1) Increasing sales and market share
- (2) Increasing profits due to higher sale and higher margins on credit sales.
- (3) Meeting competition.

#### Credit Period

Credit Period denotes the period allowed for payment by customers, in the normal course of business

**Factors:** Credit period depends on a number of factors, for example:

- 1. Nature of product i.e. if demand is inelastic or if product is perishable, credit period may be small.
- 2. Quantum of Sales - Credit may not be allowed if small quantities are purchased.
- 3. Customs and Practices - normal trade practices and those followed by competitors.
- 4. Funds available with the Company.
- 5. Credit Risk i.e. possibility of bad debts.



**Expression:** The credit period is generally stated in terms of net days. For example, if the credit terms are "**net 45**", it means that customers will repay credit obligations not later than 45 days

### 2.2 Discount Policy

**Meaning:** In the context of Debtors Management, Discount Policy involves decisions relating to:

- Percentage of cash Discount to be offered as incentive for early settlement of invoice.
- Period within which cash discount can be availed.

**Role:** Discounts are given to speed up the collection of debts. Hence, it improves the liquidity of the seller. It also ensures prompt collection and reduces risk of bad debts.



Normally, credit terms are expressed in this order: (a) the rate of cash discount, (b) the cash discount period and (c) the net credit period. For example, **credit terms of "2/10 net 60" means that a cash discount of 2% will be granted if customer pays within 10 days; if he does not avail the offer, he must pay within 60 days,** being the credit period

#### **Factors to be analyzed before credit is granted to a Customer**

A firm selling on credit terms cannot extend credit to all customers. Credit granting decision is taken on a case – to – case basis, based on the following illustrative factors:

- (a) **Nature of Product:** Generally perishable items are sold on "cash and carry" basis, while durable / non-perishable items may be sold on credit.
- (b) **Nature of customer:** A Valued customer, who has long and favorable past dealings with the firm may be given credit immediately than, a new customer. However, credit may also be offered for attracting new customers.
- (c) **Quantity purchased:** Firms may decide to grant credit only beyond a certain lot size. For example, sale up to 5 kg per invoice is made on cash basis only, while orders beyond 5 kg may be supplied on credit.
- (d) **Value of Sales:** Sometimes, the invoice value (instead of quantity) may be the determinant in a credit decision. For example, credit may be granted for amounts exceeding Rs. 15,000.
- (e) **Credit worthiness of the customer:** The creditworthiness of the customer is the most crucial factor in deciding whether credit should be granted or not.

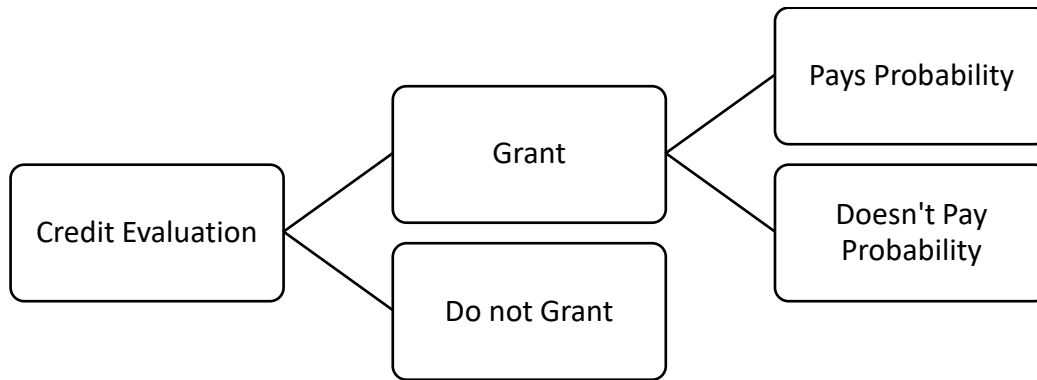
#### 2.2.1 Decision tree Analysis of Credit Granting

**Meaning:** Decision Tree Analysis is one of the techniques of Cost - Benefit Analysis, as to whether credit can be granted or not.

**Probability:** Under this technique, future uncertain events (like payment by customer, non-payment by customer) are assigned probabilities, based on the chances estimated by the firm. For example, if the chances of recovering the dues are 9 out of 10, the probability of recovery is 0.9 or 90% and that of default is 0.1 or 10%.

**Expectations:** The net expected earnings of each event is determined on the basis of probabilities:

- Expected Profit in case of Payment = [Sales Less Costs] X Probability of Payment
- Expected Loss in case of default = Costs X Probability of Default.



This is because, when a customer pays, the seller makes profit but when he fails to pay the amount the cost of the product is also lost.

### Various Sources of Credit Rating Information

Credit rating of a customer involves finding answers to two broad questions:

- Can he pay? i.e. ability or financial strength.
- Will he pay? i.e. attitude in meeting payment obligations.

A firm has to ascertain the credit rating of prospective customers, to ascertain how much and how long can credit be extended. Credit can be granted only to a customer who is reliably sound. This decision would involve analysis of the financial status of the party, his reputation and previous record of meeting commitments.

The following are the important sources of credit information:

- **Trade references:** The prospective customer may be required to give two/three trade references. Thus, the customers may give a list of personal acquaintances or some other existing credit-worthy customers. The credit manager can send a short questionnaire, seeking relevant information, to the referees.
- **Bank references:** Sometimes, the customer is asked to request the banker to provide the required information. In India, bankers do not generally give detailed and unqualified credit reference.
- **Credit bureau reports:** Associations for specific industries may maintain a credit bureau report which provides useful and authentic credit information for their members.
- **Past experience:** The past experience of dealings with an existing customer is a valuable source of essential data. The transactions should be carefully scrutinized and interpreted for finding out the credit risk involved.
- **Published financial statements:** Published financial statements of a customer, (in case of limited companies) can be examined to determine the Creditworthiness.
- **Salesman's interview and reports:** Creditworthiness can be evaluated by the reports provided by consulting salesmen or sales representatives. Such reports provide first-hand information to the Company for proper determination of the credit limit.

### 3 Modes Of Financing Receivables

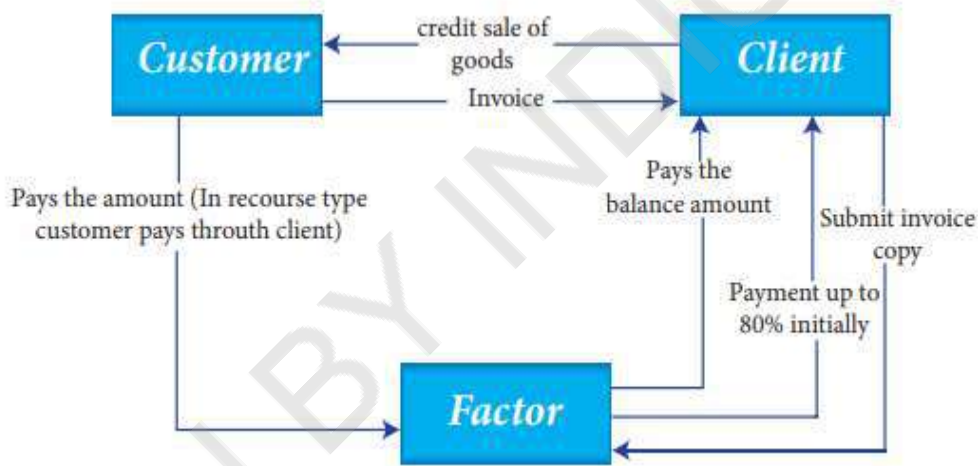
#### 3.1 Factoring

- It is a new financial service that is presently being developed in India.
- Its operation is very simple. Clients enter into an agreement with the “factor” working out a factoring arrangement according to his requirements. The factor then takes the responsibility of monitoring, follow-up, collection and risk-taking and provision of advance. The factor generally fixes up a limit customer-wise for the client (seller).
- **A factor is a financial institution which offers services relating to management and financing of debts arising from credit sales.**
- It is not just a single service, rather a portfolio of complementary financial services available to clients i.e., sellers.

##### 3.1.1 Services Made Available To Clients by A Factor

- Credit Investigation
- Sales Ledger Management
- Invoices
- Purchase Receivable
- Advance
- Bad debt Risks
- Collection and monitoring of debts,

##### 3.1.2 Mechanics Of Factoring



The following is the procedure in factoring service:

- Seller (Client) negotiates with the factor for establishing factors relationship. Request by seller for credit check on the buyer (customer) whose name and address are furnished to the factor.
- Factor checks the credit credentials and approves the buyer, a credit limit and the period up to which credit can be given.
- Seller sells the goods to the buyer.
- Seller sends invoice to the factor. The invoice is accounted for in the buyers' accounts in the factor's sales ledger.
- Factor sends notice of assignment / copy of invoice to the buyer.
- Factor advises the amount to which seller is entitled after retaining margin, say, of 20%, the residual amount being paid later.



→ On the expiry of the agreed credit period, buyer makes the payment of invoice to the factor. At this point the factor pays to seller margin money retained as per point above. If, however, the buyer defaults to pay the factor, it would still make the final payment to the seller in the case of without recourse factoring.

### 3.1.3 Advantages of Factoring

- (i) **Convertibility:** Conversion of Account Receivable in cash without botheration of repayment.
- (ii) **Definite pattern of cash flow:** Ensuring definite pattern of cash flow from credit sales
- (iii) Continuous factoring may eliminate the need of Credit and Collection Department
- (iv) **Reduction in collection and administration cost and administration cost:** Relieving the borrowing form of subsequential credit and collection costs,
- (v) Management can focus on its core activity.
- (vi) Reduction in bad debts.

### 3.1.4 Limitations of Factoring

- (i) Cost of factoring tends to be higher than the cost of other forms of short- term borrowing.
- (ii) Factoring of debt may be perceived as a sign of financial weakness.
- (iii) Business secrecy may be diluted.

### 3.1.5 Types of Factoring

- (a) **Recourse Factoring:** Under recourse factoring, the factor purchases the receivables on the condition that any loss arising out of irrevocable receivables will be borne by the client. In other words, the factor has recourse to the client if the receivable purchased turnout to be irrecoverable.
- (b) **Non-recourse or Full factoring:** As the name implies, the factor has no recourse to the client if the receivables are not recovered, i.e. the client gets total credit protection. In this type of factoring, all the components of service, viz. Short-term finance, administration of sales ledger and credit protection are available to the client.

### Statement showing Evaluation of Factoring Proposal

Particulars	₹
<b>A. SAVINGS (BENEFIT) ON AVAILING FACTOR SERVICES:</b>	
→ Administration Cost Saved	xxx
→ Bad Debts Avoided	xxx
→ Interest Saved due to reduction in average collection period (if applicable)	
[Cost of credit sales x Rate of Interest x $\frac{\text{present period} - \text{New period}}{12 \text{ or } 52 \text{ or } 365}$ x No. of days]	
<b>B. Cost of Availing factor Services:</b>	
→ Factoring Commission [Credit Sales (x) Commission %]	
→ Interest Charged by the Factor on Advance	
Annual Credit Sales	xx
(-) Factor Commission	xx
(-) Factor Reserve [i.e, Annual Credit Sales (x) Commission %] xx	
<b>Amount Available for advance</b>	<b>xx</b>
(-) Rate of Interest	xx
<b>Interest Charged by Factor on Advance</b>	<b>xx</b>
<b>NET BENEFIT / (COST) OF FACTORING [A – B]</b>	<b>xxx</b>

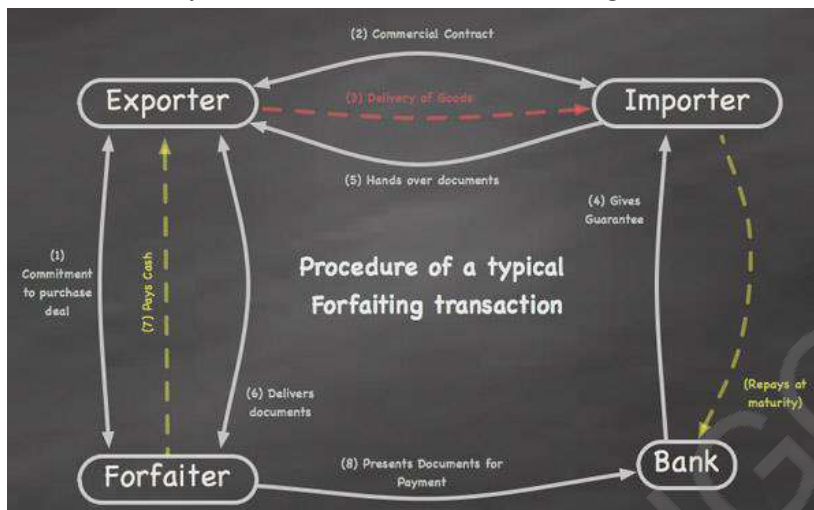
## 3.2 Forfaiting

### Meaning of Forfaiting

- ✓ Forfait' is a French term which means "relinquish a right".
- ✓ Forfaiting is an arrangement of bill discounting in which a financial institution or bank buys the trade bills (invoices) or trade receivables from exporters of goods or services, where the exporter relinquish his right to receive payment from importer.
- ✓ Financial Institutions or banks provides immediate finance to exporter 'without recourse' basis in which risk and rewards related with the bills/ receivables transferred to the financial institutions/ banks.

#### 3.2.1 Functions of Forfaiting

The functionality can be understood in the following manner:



- (i) Exporter sells goods or services to an overseas buyer
- (ii) The overseas buyers i.e. the importer on the basis trade bills and import documents draws a letter of credit (or other negotiable instruments) through its bank (known as importer's bank).
- (iii) The exporter on receiving the letter of credit (or other negotiable instruments) approaches to its bank (known as exporter's bank)

- (iv) The exporter's bank buys the letter of credit (or other negotiable instruments) 'without recourse basis and provides the exporter the payment for the bill.

## 3.3 Pledging

This refers to the use of a firm's receivable to secure a short term loan. After cash, a firm's receivables can be termed as most liquid assets and this serve as prime collateral for a secured loan. The lender scrutinizes the quality of account receivables, selects acceptable accounts, creates a lien on the collateral and fixes percentage of financing receivables which ranges around 50 to 90%.

## 4 Measures of Monitoring Receivables

Monitoring of receivables involves the following measures:

### 4.1 Average Age of Receivables

Debtors Turnover Ratio and Average Collection Period are worked out at periodic intervals. These are compared with the industry norms or the standards set by firm. In case of high collection period, intense collection efforts are initiated.

### 4.2 Ageing Schedule

The pattern of outstanding dues / receivables is determined by preparing the Ageing Schedule. If the receivables denote old outstanding dues for longer periods, suitable action should be taken to collect them immediately.

### 4.3 Collection Programme

The procedures for collection e.g. reminding letters, direct follow-up etc. should be initiated based on the company's policies and procedures



### Concept of Ageing Schedule

An important means to get an insight into collection pattern of debtors is the preparation of their 'Ageing Schedule'. Receivables are classified according to their age from the date of invoicing e.g. 0 – 30 days, 31 – 60 days, 61 – 90 days, 91 – 120 days and more. The ageing schedule can be compared with earlier month's figures or the corresponding month of the earlier year. This classification helps the firm in its collection efforts and enables management to have a close control over the quality of individual accounts. The ageing schedule can be compared with other firms also

**Role:**

Preparation of ageing schedule helps management in the following ways:

- Analysis of quality of individual accounts.
- Intra-firm and Inter-firm comparison, i.e. comparing liquidity of present receivables with the past periods and also comparing current liquidity of receivables of one firm with that of other firms.
- Trend Analysis of Debtors.
- Supplement to average collection period of receivables / sales analysis.
- Recognition of recent increase and slump in sales.

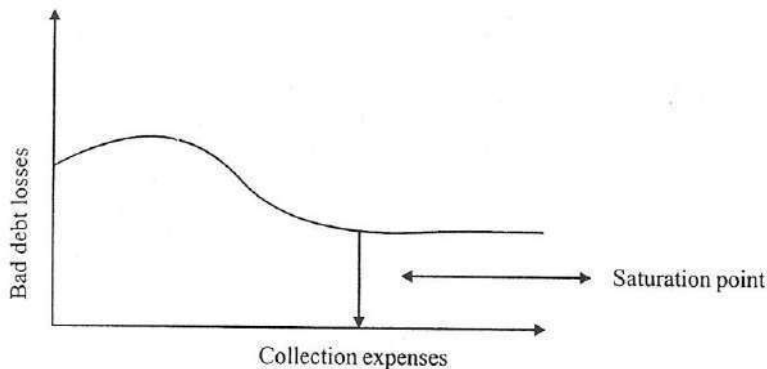
An Illustrative ageing Schedule is given below:

Period Due	No. of Parties	No. of bills	Amount Due	% of Total	Remarks
< 15 days	65	70	34180	3.42%	Less than normal credit period
16 – 30 days	12	80	46840	4.68%	Less than normal credit period
31 – 45 days	86	241	3,83,690	38.37%	Normal credit period debts
46 – 60 days	91	196	3,59,960	36.00%	Regular Reminders sent
61 – 90 days	43	52	97,100	9.71%	Special Reminders sent
91 – 180 days	12	22	41,350	4.13%	Rs. 18,150 doubtful – party may insolvent.
181 – 365 days	6	9	8000	0.80%	Legal notice sent – reply due
➤ 1 year	3	3	17860	1.79%	Suit filed - decision awaited
➤ 2 years	2	2	11,020	1.1%	Suit filed - decision awaited

## Collection Programme/Policy

**Role of collection Policy:** Average Collection Period and Bad Debt losses are reduced by efficient and timely collection of debtors. Hence, a proper collection policy should be laid down.

**Aspects of Collection Policy:** The following aspects should be covered in Collection Policy and procedures:



- Timing of the collection process - when to start reminding etc.
- Dispatch of Reminder letters to Customers.
- Personal follow-up by Company's representatives and telephonic calls.
- Appointment of agents for collection or follow-up.
- Dealing with default accounts, legal action to be initiated, notice to defaulting customer etc.

## 5 Innovations in Receivable Management

Following are the major determinants for significant innovations in accounts receivable management and process efficiency:

- (1) **Re-engineering Receivable Process:** In some of the organizations real cost reductions and performance improvements have been achieved by re-engineering in accounts receivable process. **Re-engineering is a fundamental re-think and re-design of business processes by incorporating modern business approaches.** The nature of accounts receivables is such that decisions made elsewhere in the organization are likely to affect the level of resources that are expended on the management of accounts receivables.

The following aspects provide an opportunity to improve the management of accounts receivables:

- (a) **Centralization:** Centralization of high nature transactions of accounts receivables and payable is one of the practices for better efficiency. This focuses attention on specialized groups for speedy recovery.
- (b) **Alternative Payment Strategies:** Alternative payment strategies in addition to traditional practices result into efficiencies in the management of accounts receivables. It is observed that payment of accounts outstanding is likely to be quicker where a number of payment alternatives are made available to customers. Besides this, providing convenient payment methods is a marketing tool that is of benefit in attracting and retaining customers. The following alternative modes of payment may also be used along with traditional methods like Cheque Book, online payments etc., for making timely payment, added customer service, reducing remittance processing costs and improved cash flows and better debtor turnover.
  - **Direct debit:** i.e. authorization for the transfer of funds from the purchaser's bank account.
  - **Integrated Voice Response:** This system uses human operators and a computer-based system to allow customers to make payment over the phone, generally by

credit card. This system has proved to be beneficial in the organization's processing a large number of payments regularly.

- **Collection by a third party:** The payment can be collected by an authorized external firm. The payments can be made by cash, cheque, credit card or Electronic fund transfer. Banks may also be acting as collecting agents of their customers and directly depositing the collections in customer's bank accounts.
  - **Lock Box Processing:** Under this system customers are instructed to send cheques to designated post box. The bank collects cheques from the boxes directly.
  - **Payments via Internet**
- (2) **Evaluation of Risk:** Risk evaluation is a major component in the establishment of an effective control mechanism. Once risks have been properly assessed controls can be introduced to either contain the risk to an acceptable level or to eliminate them entirely. This also provides an opportunity for removing inefficient practices.
- (3) **Use of Latest Technology:** Technological developments now-a-days provides an opportunity for improvement in accounts receivables process. The major innovations available are the integration of systems used in the management of accounts receivables, the automation and the use of e-commerce.
- (a) **E-commerce:** It refers to the use of computer and electronic telecommunication technologies, particularly on an inter-Organizational level, to support trading in goods and services. It uses technologies such as Electronic Data Interchange (EDI), Electronic Mail, Electronic Funds Transfer (EFT) and Electronic Catalogue System to allow the buyer and seller to transact business by exchange of information between computer application system.
  - (b) **Accounts Receivable System:** Now-a-days all the big companies develop and maintain automated receivable management systems. Manual systems of recording the transactions and managing receivables, is not only cumbersome but ultimately costly also. **These integrated systems automatically update all the accounting records affected by a transaction.** For example, if a transaction of credit sale is to be recorded, the system increases the amount the customer owes to the firm, reduces the inventory for the item purchased, and records the sale. This system of a company allows the application and tracking of receivables and collections, using the automated receivables system allows the company to store important information for an unlimited number of customers and transactions, and accommodate efficient processing of customer payments and adjustments.
- (4) **Receivable Collection Practices:** The aim of debtor's collection should be to reduce, monitor and control the accounts receivable at the same time maintain customer goodwill. The fundamental rule of sound receivable management should be to reduce the time lag between the sale and collection. Any delays that lengthen this span causes receivables to unnecessary build up and increase the risk of bad debts.
- The following are major receivable collection procedures and practices:**
- i. Issue of Invoice
  - ii. Open account or open-end credit
  - iii. Credit terms or time limits
  - iv. Periodic statements
  - v. Use of payment incentives and penalties
  - vi. Record keeping and Continuous Audit
- Export Factoring.
- (5) **Business Process Outsourcing:** This refers to a strategic business tool whereby an outside agency takes over the entire responsibility for managing a business process.

## 1 Introduction

Management of Payables involves management of creditors and suppliers. A **Trade creditor is a spontaneous source of finance in the sense that it arises from ordinary business transaction. And there is no explicit cost for availing a trade credit.** Creditors are a vital part of effective cash management and should be managed carefully to enhance the cash position.

## 2 Cost of Trade Credit

### 2.1 Cost of Availing Trade Credit

- **Discount:** There is a chance of loss of an implicit cost if the discount option is if any, not taken on the repayment of creditors.  
For example, A company (supplier or the person giving credit) give an option of one month credit period to repay the amount, But if the amount is paid within 20 days can avail a cash discount of 5%. Here, if the discount is not availed that becomes a cost. Therefore, the availing trade credit is the cost of foregone discount.

When a supplier offers a cash discount to the buyer for making prompt payment within a specified period, the buyer shall compare the annual opportunity cost of foregoing the cash discount (or the cost of availing credit or the implicit rate of interest) with the cost of other sources of credit to decide whether or not cash discount should be availed. The annual opportunity cost of foregoing cash discount can be calculated as follows:

$$\frac{\% \text{ of cash discount}}{100 (-) \% \text{ of cash discount}} \times \frac{12 \text{ or } 52 \text{ or } 365}{\text{Credit Period } (-) \text{ Discount period}}$$

- **Loss of Goodwill:** It is also important to look after your creditors - slow payment by you may create ill-feeling and your supplies could be disrupted and also create a bad image for your company.
- **Cost of Managing:** Admin cost and accounting cost that would otherwise be incurred.
- **Other Conditions:** For availing trade credit from supplier, there is possibility of buying in bulk or as per the conditions (minimum block or lot size) prescribed by the supplier. This leads to crossing the maximum stock has to be fitted. Therefore, unnecessarily it is buying and blocking more and more funds because of the conditions prescribed by supplier, may lead to become an extra cost.

### 2.2 Cost of Not availing Trade credit

- **Impact of Inflation:** The trade credit option can be repaid only on the basis of agreement or credit period given at fixed price. Since the non availing of credit option or paying outright may lead to bear increased cost due to inflation.
- **Interest rate:** Trade credit is an interest free loan. Since not availing trade credit the interest becomes an implicit cost.

**Inconvenience to suppliers:** Suppliers may have regular habit of selling goods on credit. If the customer is not opting for trade credit, This might disturb day-to-day transactions.

### Introduction

The working capital finance may be classified between the two categories:

- (i) Spontaneous sources: Naturally arise in the course of business operations. Trade credit, credit from employees, credit from suppliers of services etc.
- (ii) Negotiated sources: Those which have to be specifically negotiated with lenders like commercial banks, financial institutions, general public etc.

The following parameters will guide the decision of finance manager in his decision

- a. Cost factor
- b. Impact on credit rating
- c. Feasibility
- d. Reliability
- e. Restrictions
- f. Hedging approach or matching approach

### Sources of Finance

- a. **Trade credit:** Provided to the purchaser organisation by the sellers or service providers
- b. **Bills payable:** The purchaser will have to give a written promise to pay the amount of the bill/invoice either on demand or at a fixed future date to the seller or the bearer of the note.
- c. **Accrued Expenses:** It is the service availed by the firm, but the payment for which has yet to be made.

### Inter-corporate Loans and Deposits

The organizations having surplus funds invest for short term period with other organizations which the rate of interest will be higher than the bank rate of interest.

### Commercial Papers

It is an unsecured promissory note issued by a firm to raise funds for a short period. The maturity period ranges from minimum 7 days to less than 1 year from the date of issue. It can be issued in denomination of Rs 5 lakhs or multiples thereof.

Advantages:

From the point of issuing company

- a. CP is sold on an unsecured basis and does not contain any restrictive conditions.
- b. Maturing CP can be repaid by selling new CP.
- c. Maturing CP can be tailored to suit the requirements of the issuing firm.
- d. CP can be issued as a source of fund.
- e. The cost of CP to the issuing firm is lower than the cost of commercial bank loans

Limitations:

- a. Only highly credit rating firms can use it.
- b. It can neither be redeemed before maturity nor can be extended beyond maturity.

### **Funds generated from Operations**

Funds generated from operations during an accounting period, increase working capital by an equivalent amount.

Two main components are profit and depreciation.

### **Public Deposits**

Deposits from the public are one of the important sources of finance particularly for well established big companies with huge capital base for short and medium term.

### **Bills Discounting**

In this the supplier of goods draws a bill of exchange with direction to the buyer to pay a certain amount of money after a certain period, and gets its acceptance from the buyer or drawee of the bill.

### **Bill Rediscounting Scheme**

It was introduced by Reserve Bank of India w.e.f. 1<sup>st</sup> Nov 1970 in order to extend the use of the bill of exchange as an instrument for providing credit and the creation of a bill market in India with a facility for the rediscounting of eligible bills by banks.

### **Factoring**

It is a method of financing whereby a firm sells its trade debts at a discount to a financial institution.

A factor is an agent who collects the dues of his client for a certain fee.

### **Working Capital Finance From Banks**

The two committees viz., Tandon Committee and Chore Committee have evolved guidelines and parameters in a working capital financing, which have laid the foundation for development and innovation.

Instructions:

Assessment of Working Capital

- RBI has withdrawn the prescription in regard to assessment of working capital needs based on the concept of Maximum Permissible Bank Finance (MPBF) in April 1997.

### **Forms of Bank Credit**

1. **Cash Credit:** It was given by the banker to the customers by giving certain amount of credit on continuous basis.
2. **Bank Overdraft:** It is a short term borrowing facility made available to the companies in case of urgent need of funds. The banks will impose limits on the amount they can lend. When the borrowed funds are no longer required they can quickly and easily be repaid.
3. **Bill Discounting:** The company which sells goods on credit will normally draw a bill on the buyer who will accept it and sends it to the seller of goods. The seller in turn discounts the bill with his banker.



4. **Bills Acceptance:** A company draws a bill of exchange on bank. The bank accepts the bill and promise to pay out the amount of the bill at some specified future date.
5. **Line of Credit:** It is a commitment by a bank to lend a certain amount of funds on demand specifying the maximum amount.
6. **Letter of Credit:** It is an arrangement by which the issuing bank on the instructions of a customer or on its own behalf undertakes to pay or accept or negotiate or authorizes another bank to do so against stipulated documents subject to compliance with specified terms and conditions.
7. **Bank Guarantee:** It is a facility that the commercial bank extend on behalf of their clients in favour of third parties who will be the beneficiaries of the guarantees.

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**CHAPTER 9**  
**ILLUSTRATIONS ON WORKING CAPITAL MANAGEMENT**

**Illustration 1**

A firm has the following data for the year ending 31st March 2017:

Particulars	Amt (in Rs)
Sales (1,00,000 @ Rs. 20)	20,00,000
Earnings before Interest and Taxes	2,00,000
Fixed Assets	5,00,000

The three possible current assets holdings of the firm are Rs. 5,00,000, Rs. 4,00,000 and Rs. 3,00,000. It is assumed that fixed assets level is constant, and profits do not vary with current assets levels. Show the effect of the three alternative current assets policies.

**Illustration 2**

A company is considering its working capital investment and financial policies for the next year. Estimated fixed assets and current liabilities for the next year are Rs. 2.60 crores and Rs. 2.34 crores respectively. Estimated Sales and EBIT depend on current assets investment, particularly inventories and book-debts. The financial controller of the company is examining the following alternative Working Capital Policies:

(Rs. Crores)

Working Capital Policy	Investment in C. A	Estimated Sales	EBIT
Conservative	4.5	12.30	1.23
Moderate	3.90	11.50	1.15
Aggressive	2.60	10.00	1.00

After evaluating the working capital policy, the Financial Controller has advised the adoption of the moderate working capital policy. The company is now examining the use of long-term and short-term borrowings for financing its assets. The company will use Rs. 2.50 crores of the equity funds. The corporate tax rate is 35%. The company is considering the following debt alternatives.

Financing Policy	Short-term Debt	Long-term Debt
Conservative	0.54	1.12
Moderate	1.00	0.66
Aggressive	1.50	0.16
Interest rate – Average	12%	16%

You are required to calculate the following:

- i. Working Capital Investment for each policy:
  - a. Net Working Capital position
  - b. Rate of Return
  - c. Current ratio
- ii. Financing for each policy:
  - a. Net Working Capital position.
  - b. Rate of Return on Shareholders' equity.
  - c. Current ratio

**Illustration 3 [Net operating cycle period – Illustration1]**

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

S.No.	Particulars	Amt in Rs
(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

#### Illustration 4 [Net operating cycle period – Illustration2]

The Trading and Profit and Loss Account of Beta Ltd. for the year ended 31st March 2011 is given below:

Particulars		Amount (Rs.)	Particulars		Amount (Rs.)
<b>To Opening Stock:</b>			By Sales (Credit)		20,00,000
Raw Materials	1,80,000		<b>By Closing Stock:</b>		
Work- in- progress	60,000		Raw Materials	2,00,000	
Finished Goods	<u>2,60,000</u>	5,00,000	Work-in-progress	1,00,000	
To Purchases (credit)		11,00,000	Finished Goods	<u>3,00,000</u>	6,00,000
To Wages					
To Production Expenses		3,00,000			
To Gross Profit c/d		2,00,000			
		<u>5,00,000</u>			
To Administration Expenses		<u>26,00,000</u>	By Gross Profit b/d		<u>26,00,000</u>
To Selling Expenses		1,75,000			5,00,000
To Net Profit		75,000			
		2,50,000			
		5,00,000			5,00,000

The opening and closing balances of debtors were Rs. 1,50,000 and Rs. 2,00,000 respectively whereas opening and closing creditors were Rs. 2,00,000 and Rs. 2,40,000 respectively. You are required to ascertain the working capital requirement by operating cycle method. (Assume No. of days as 360)

#### Illustration 5 [Computation of Cash Cost]

The following information is provided by the DPS Limited for the year ending 31<sup>st</sup> March 2013.

Raw material storage period	55 days
Work-in-progress conversion period	18 days
Finished Goods storage period	22 days
Debt collection period	45 days
Creditors' payment period	60 days
Annual Operating cost (Including depreciation of Rs. 2,10,000)	Rs. 21,00,000

[1 year = 360 days]

You are required to calculate:

- Operating Cycle period.
- Number of Operating Cycle in a year.
- Amount of working capital required for the company on a cash cost basis.

The company is a market leader in its product, there is virtually no competitor in the market. Based on a market research it is planning to discontinue sales on credit and deliver products based on pre-payments. Thereby, it can reduce its working capital requirement substantially. What would be the reduction in working capital requirement due to such decision?

#### Illustration 6 [Illustration X]

On 1st January, the Managing Director of Naureen Ltd. wishes to know the amount of working capital that will be required during the year. From the following information prepare the working capital requirements forecast.

- Production during the previous year was 60,000 units. It is planned that this level of activity would be maintained during the present year.
- The expected ratios of the cost to selling prices are Raw materials 60%, Direct wages 10% and Overheads 20%.
- Raw materials are expected to remain in store for an average of 2 months before issue to production.
- Each unit is expected to be in process for one month, the raw materials being fed into the pipeline immediately and the labour and overhead costs accruing evenly during the month.
- Finished goods will stay in the warehouse awaiting dispatch to customers for approximately 3 months.
- Credit allowed by creditors is 2 months from the date of delivery of raw material.
- Credit allowed to debtors is 3 months from the date of dispatch.
- Selling price is Rs.5 per unit.
- There is a regular production and sales cycle.
- Wages and overheads are paid on the 1st of each month for the previous month.
- The company normally keeps cash in hand to the extent of Rs.20,000.

### Illustration 7 [Illustration Y]

A proforma cost sheet of a Company provides the following particulars:

	Amt per Unit (Rs.)
Raw materials cost	100
Direct labour cost	37.50
Overheads cost	75
Total cost	212.50
Profit	37.50
Selling Price	250

The Company keeps raw material in stock, on an average for one month; work-in-progress, on an average for one week; and finished goods in stock, on an average for two weeks.

The credit allowed by suppliers is three weeks and company allow four weeks credit to its debtors. The lag in payment of wages is one week and lag in payment of overhead expenses is two weeks.

The Company sells one-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 1,30,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. Work-in-progress stock is 80% complete in all respects. Consider a safety margin of 15% as provision.

### Illustration 8 (Double Shift)

Samreen Enterprises has been operating its manufacturing facilities till 31.3.2017 on a single shift working with the following cost structure:

Particulars	Per unit (Rs.)	Fixed (Rs.)	Variable (Rs.)
Cost of Materials	6.00		
Wages ( out of which 40% fixed)	5.00	2.00	3.00
Overheads (out of which 80% fixed)	5.00	4.00	1.00
Profit	<u>2.00</u>		
Selling Price	<u>18.00</u>		
Sales during 2016-17 – Rs. 4,32,000.			

As at 31.3.2017 the company held:

Particulars	Amount (Rs.)
Stock of raw materials (at cost)	36,000
Work-in-progress (valued at prime cost)	22,000
Finished goods (valued at total cost)	72,000
Sundry debtors	1,08,000

- In view of increased market demand, it is proposed to double production by working an extra shift.
  - It is expected that a 10% discount will be available from suppliers of raw materials in view of increased volume of business.
  - Selling price will remain the same.
  - The credit period allowed to customers will remain unaltered. Credit availed of from suppliers will continue to remain at the present level i.e., 2 months.
  - Lag in payment of wages and expenses will continue to remain half a month.
- You are required to PREPARE the additional working capital requirements, if the policy to increase output is implemented.

#### Illustration 9 [Q5 May 2018\*]

Day Ltd., a newly formed company has applied to the Private Bank for the first time for financing its Working Capital Requirements.

The following information are available about the projections for the current year:

Estimated Level of Activity	Completed Units of Production 31200 plus unit of work in progress 12000
Raw Material Cost	Rs. 40 per unit
Direct Wages Cost	Rs. 15 per unit
Overhead	Rs. 40 per unit (inclusive of Depreciation Rs. 10 per unit)
Selling Price	Rs. 130 per unit
Raw Material in Stock	Average 30 days consumption
Work in Progress Stock	Material 100% and Conversion Cost 50%
Finished Goods Stock	24000 Units
Credit Allowed by the supplier	30 days
Credit Allowed to Purchasers	60 days
Direct Wages (Lag in payment)	15 days
Expected Cash Balance	Rs. 2,00,000

Assume that production is carried on evenly throughout the year (360 days) and wages and overheads accrue similarly.

All sales are on the credit basis.

You are required to calculate the Net Working Capital Requirement on Cash Cost Basis.

#### Illustration 10 [Q5 May 2019\*]

Bitra Limited manufactures used in the steel industry.

The following information regarding the company is given for your consideration:

- Expected level of production 9000 units per annum.
- Raw materials are expected to remain in store for an average of two months before issue to production.
- Work-in-progress (50 percent complete as to conversion cost) will approximate to ½ month's production.
- Finished goods remain in warehouse on an average for one month.
- Credit allowed by suppliers is one month.
- Two month's credit is normally allowed to debtors.
- A minimum cash balance of Rs. 67,500 is expected to be maintained.
- Cash sales are 75 percent less than the credit sales.
- Safety margin of 20 percent to cover unforeseen contingencies.
- The production pattern is assumed to be even during the year.
- The cost structure for Bitra Limited's product is as follows:

Raw Materials	Rs. 80 per unit
Direct Labour	Rs. 20 per unit
Overheads (including depreciation Rs. 20)	Rs. 80 per unit

Total Cost	Rs. 180 per unit
Profit	Rs. 20 per unit
Selling Price	Rs. 200 per unit

You are required to estimate the working capital requirement of Beta limited

### Illustration 11 [Q8 NOV 2019 RTP\*]

Following are cost information of KG Ltd., which has commenced a new project for an annual production of 24,000 units which is the full capacity:

Materials	80.00
Direct labour and variable expenses	40.00
Fixed manufacturing expenses	12.00
Depreciation	20.00
Fixed administration expenses	8.00
	160.00

The selling price per unit is expected to be Rs.192 and the selling expenses Rs.10 per unit, 80% of which is variable. In the first two years of operations, production and sales are expected to be as follows:

Year	Production (No. of units)	Sales (No. of units)
1	12,000	10,000
2	18,000	17,000

To assess the working capital requirements, the following additional information is available:

(a)	Stock of materials	2 months' average consumption
(b)	Work-in-process	Nil
(c)	Debtors	2 month's average sales.
(d)	Cash balance	Rs. 1,00,000
(e)	Creditors for supply of materials	1 month's average purchase during the year.
(f)	Creditors for expenses	1 month's average of all expenses during the year.

PREPARE, for the two years:

- A projected statement of Profit/Loss (Ignoring taxation); and
- A projected statement of working capital requirements

## ILLUSTRATIONS ON TREASURY AND CASH MANAGEMENT

### Illustration 1 [Cash budget]

Prepare monthly cash budget for six months beginning from April 2017 on the basis of the following information: -

- Estimated monthly sales are as follows:

Month	Rs	Month	Rs
January	1,00,000	June	80,000
February	1,20,000	July	1,00,000
March	1,40,000	August	80,000
April	80,000	September	60,000
May	60,000	October	1,00,000

- Wages and salaries are estimated to be payable as follows: -

Month	Rs	Month	Rs
April	9,000	July	10,000
May	8,000	August	9,000

June	10,000	September	9,000
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- Of the sales, 80% is on credit and 20% for cash. 75% of the credit sales are collected within one month and the balance in two months. There are no bad debt losses.
- Purchases amount to 80% of sales and are made on credit and paid for in the month preceding the sales.
- The firm has 10% debentures of Rs.1,20,000. Interest on these has to be paid quarterly in January, April and so on.
- The firm is to make an advance payment of tax of Rs.5,000 in July,2017.
- The firm had a cash balance of Rs.20,000 on April 1, 2017, which is the minimum desired level of cash balance. Any cash surplus/deficit above/below this level is made up by temporary investments/liquidation of temporary investments or temporary borrowings at the end of each month (interest on these to be ignored).

### Illustration 2 [Cash Budget]

From the following information relating to a departmental store, you are required to prepare for the three months ending 31st March,2017: -

- Month-wise cash budget on receipts and payments basis; and
- Statement of Sources and uses of funds for the three months period.

It is anticipated that the working capital at 1st January 2017 will be as follows: -

Particulars	Amount (Rs '000)
Cash in hand and at bank	545
Short term investments	300
Debtors	2,570
Stock	1,300
Trade Creditors	2,110
Other Creditors	200
Dividend Payable	485
Tax due	320
Plant	800

Budgeted Profit Statement	(Rs in '000)		
	January	February	March
Sales	2,100	1,800	1,700
Cost of Sales	(1,635)	(1,405)	(1,330)
Gross Profit	465	395	370
Administrative, Selling & Distribution Expenses	(315)	(270)	(255)
Net Profit Before Tax	150	125	115

Budgeted balances at the end of each months	(Rs in '000)		
	31 <sup>st</sup> Jan	28 <sup>th</sup> Feb	31 <sup>st</sup> Mar
Short term investments	700	-	200
Debtors	2,600	2,500	2,350
Stock	1,200	1,100	1,000
Trade Creditors	2,000	1,950	1,900
Other Creditors	200	200	200
Dividend payable	485	-	-
Tax due	320	320	320
Plant (Depreciation ignored)	800	1,600	1,550

Depreciation amount to Rs.60,000 is included in the budgeted expenditure for each month.

### Illustration 3 [Zeta Ltd]

The following information relates to Zeta Limited, a publishing company:

The selling price of a book is Rs.15,

Sales are made on credit through a book club & invoiced on the last day of the month.

Variable costs of production per book:

- Materials (Rs.5),
- Labour (Rs.4), &
- Overhead (Rs.2)

The sales manager has forecasted the following volumes:

Month	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
<b>Books</b>	1,000	1,000	1,000	1,250	1,500	2,000	1,900	2,200	2,200	2,300

Customers are expected to pay as follows:

<b>One month after the sale</b>	<b>40%</b>
<b>Two months after the sale</b>	60%

- The company produces the books two months before they are sold and the creditors for materials are paid two months after production.
- Variable overheads are paid in the month following production and are expected to increase by 25% in April.
- 75% of wages are paid in the month of production and 25% in the following month. A wage increase, of 12.5% will take place on 1<sup>st</sup> March.
- The company is going through a restructuring and will sell one of its freehold properties in May for Rs.25,000, but it is also planning to buy a new printing press in May for Rs.10,000. Depreciation is currently Rs.1,000 per month and will rise to Rs.1,500 after the purchase of the new machine.
- The company's corporation tax (of Rs.10,000) is due for payment in March.
- The company presently has a cash balance at bank on 31 December 2013, of Rs.1,500.

You are required to **prepare a cash budget for the six months from January to June**

#### Illustration 4 [Long Term Cash Budget]

You are given below the Profit & Loss Accounts for two years for a company:

	Year 1	Year 2		Year 1	Year 2
	Rs.	Rs.		Rs.	Rs.
To Opening stock	80,00,000	1,00,00,000	By Sales	8,00,00,000	10,00,00,000
To Raw materials	3,00,00,000	4,00,00,000	By Closing stock	1,00,00,000	1,50,00,000
To Stores	1,00,00,000	1,20,00,000	By Misc. Income	10,00,000	10,00,000
To Manufacturing Expenses	1,00,00,000	1,60,00,000			
To Other Expenses	1,00,00,000	1,00,00,000			
To Depreciation	1,00,00,000	1,00,00,000			
To Net Profit	1,30,00,000	1,80,00,000			
	<b>9,10,00,000</b>	<b>11,60,00,000</b>		<b>9,10,00,000</b>	<b>11,60,00,000</b>

- Sales are expected to be Rs.12,00,00,000 in year 3.
- As a result, other expenses will increase by Rs. 50,00,000 besides other charges.
- Only raw materials are in stock. Assume sales and purchases are in cash terms and the closing stock is expected to go up by the same amount as between year 1 and 2.
- You may assume that no dividend is being paid. The Company can use 75% of the cash generated to service a loan.

How much **cash from operations will be available in year 3** for the purpose? Ignore income tax.

#### Illustration 5 [Cash Budget & Proforma]



Consider the balance sheet of Maya Limited at December 31 (in thousands). The company has received a large order and anticipates the need to go to its bank to increase its borrowings. As a result, it has to forecast its cash requirements for January, February and March. Typically, the company collects 20 per cent of its sales in the month of sale, 70 per cent in the subsequent month, and 10 per cent in the second month after the sale. All sales are credit sales.

Balance sheet of Maya Limited as on December 31st (in thousands)

Particulars	Value in Rs	Particulars	Value in Rs
Cash	50	Accounts payable	360
Accounts receivable	530	Bank loan	400
Inventories	545	Accruals	212
<b><u>Current asset</u></b>	<b>1,125</b>	<b><u>Current liabilities</u></b>	<b>972</b>
Net fixed assets	1,836	Long-term debt	450
		Common stock	100
		Retained earnings	1,439
Total assets	<b>2,961</b>	Total liabilities and equity	<b>2,961</b>

- Purchases of raw materials are made in the month prior to the sale and amount to 60% of sales in the subsequent month.
- Payments for these purchases occur in the month after the purchase.
- Labour costs, including overtime, are expected to be Rs.1,50,000 in January, Rs.2,00,000 in February, and Rs.1,60,000 in March.
- Selling, administrative, taxes, and other cash expenses are expected to be Rs.1,00,000 per month for January through March.

Actual sales in November and December and projected sales for January through April are as follows (in thousands):

<b>November</b>	<b>500</b>	<b>January</b>	<b>600</b>	<b>March</b>	<b>650</b>
<b>December</b>	600	February	1,000	April	750

Based on this information:

- Prepare a cash budget for the months of January, February, and March.
- Determine the amount of additional bank borrowings necessary to maintain a cash balance of Rs.50,000 at all times.
- Prepare a pro forma balance sheet for March 31.

### Illustration 6 [Prachi Ltd]

Prachi Ltd is a manufacturing company producing and selling a range of cleaning products to wholesale customers. It has three suppliers and two customers. Prachi Ltd relies on its cleared funds forecast to manage its cash.

You are an accounting technician for the company and have been asked to prepare a cleared funds forecast for the period Monday 7 January to Friday 11 January 2017 inclusive.

You have been provided with the following information:

- Receipts from customers

Customer name	Credit terms	Payment method	7 Jan 2017 sales	7 Dec 2016 sales
W Ltd	1 calendar month	BACS	Rs. 150,000	Rs. 130,000
X Ltd	None	Cheque	Rs. 180,000	Rs. 160,000

- Receipt of money by BACS (Bankers' Automated Clearing Services) is instantaneous.
- X Ltd's cheque will be paid into Prachi Ltd's bank account on the same day as the sale is made and will clear on the third day following this (excluding day of payment).

- Payments to suppliers

Supplier Name	Credit terms	Payment method	7 Jan 2017 purchases	7 Dec 2016 purchases	7 Nov 2016 purchases
A Ltd	1 calendar month	Standing order	Rs. 65,000	Rs. 55,000	Rs. 45,000
B Ltd	2 calendars months	Cheque	Rs. 85,000	Rs. 80,000	Rs. 75,000
C Ltd	None	Cheque	Rs. 95,000	Rs. 90,000	Rs. 85,000

- Prachi Ltd has set up a standing order for Rs. 45,000 a month to pay for supplies from A Ltd. This will leave Prachi's bank account on 7 January. Every few months, an adjustment is made to reflect the actual cost of supplies purchased (you need to make this adjustment).
- Prachi Ltd will send out, by post, cheques to B Ltd and C Ltd on 7 January. The amounts will leave its bank account on the second day following this (excluding the day of posting).

ii. **Wages and salaries**

	December 2016	January 2017
<b>Weekly wages</b>	Rs. 12,000	Rs. 13,000
<b>Monthly salaries</b>	Rs. 56,000	Rs. 59,000

- Factory workers are paid cash wages (weekly). They will be paid one week's wages, on 11 January, for the last week's work done in December (i.e. they work a week in hand).
  - All the office workers are paid salaries (monthly) by BACS. Salaries for December will be paid on 7 January.
- iii. **Other miscellaneous payments**
- Every Monday morning, the petty cashier withdraws Rs. 200 from the company bank account for the petty cash. The money leaves Prachi's bank account straight away.
  - The room cleaner is paid Rs. 30 from petty cash every Wednesday morning.
  - Office stationery will be ordered by telephone on Tuesday 8 January to the value of Rs. 300. This is paid for by company debit card. Such payments are generally seen to leave the company account on the next working day.
  - Five new software will be ordered over the Internet on 10 January at a total cost of Rs. 6,500. A cheque will be sent out on the same day. The amount will leave Prachi Ltd's bank account on the second day following this (excluding the day of posting).
- iv. **Other information** the balance on Prachi's bank account will be Rs. 200,000 on 7 January 2017. This represents both the book balance and the cleared funds.

**Required:**

Prepare a cleared funds forecast for the period Monday 7 January to Friday 7 January 2017 inclusive using the information provided. Show clearly the uncleared funds float each day.

**Illustration 7 [Sai Trading Company]**

The following information is available in respect of Sai trading company:

- On an average, debtors are collected after 45 days; inventories have an average holding period of 75 days and creditor's payment period on an average is 30 days.
- The firm spends a total of Rs. 120 lakhs annually at a constant rate.
- It can earn 10 per cent on investments.

From the above information, you are required to calculate:

- The cash cycle and cash turnover,
- Minimum amounts of cash to be maintained to meet payments as they become due
- Savings by reducing the average inventory holding period by 30 days.

**illustration 8 [Cash Management Tools (Optimum bal /EOQ Model)]**

A firm maintains a separate account for cash disbursement. Total disbursement are Rs. 1,05,000 per month or Rs. 12,60,000 per year. Administrative and transaction cost of transferring cash to disbursement account is Rs. 20 per transfer. Marketable securities yield is 8% per annum.

Determine the optimum cash balance according to William J. Baumol model.

**Illustration 9 [Q3 Nov 2019 Question paper (New Syllabus)\***

Slide Ltd. is preparing a cash flow forecast for the three months period from January to the end of March. The following sales volumes have been forecasted:

Months	December	January	February	March	April
Sales (units)	1,800	1,875	1,950	2,100	2,250

- Selling price per unit is Rs. 600.
  - Sales are all on one-month credit.
  - Production of goods for sale takes place one month before sales.
  - Each unit produced requires two units of raw materials costing Rs. 150 per unit.
  - No raw material inventory is held.
  - Raw materials purchases are on one-month credit.
  - Variable overheads and wages equal to Rs. 100 per unit are incurred during production and paid in the month of production.
  - The opening cash balance on 1st January is expected to be Rs. 35,000.
  - A long term loan of Rs. 2,00,000 is expected to be received in the month of March.
  - A machine costing Rs. 3,00,000 will be purchased in March.
- a. Prepare a cash budget for the months of January, February and March and calculate the cash balance at the end of each month in the three months period.
- b. Calculate the forecast current ratio at the end of the three months period

**ILLUSTRATIONS ON MANAGEMENT OF INVENTORY**

**Illustration 1 [Illustration A, B, C]**

A Company's requirement for 10 days is 6,300 units. The ordering cost per order is Rs 10 and the carrying cost per order is Rs 0.26. You are required to calculate the Economic Ordering Quantity.

**Illustration 2 [Illustration A, B, C]**

Pureair Company is a distributor of air filters to retail stores. It buys its filters from several manufacturers. Filters are ordered in lot sizes of 1,000 and each order costs Rs 40 to place. Demand from retail stores is 20,000 filters per month, and carrying costs is Rs 0.10 a filter per month.

- a. What is the optimal order quantity with respect to so many lot sizes?
- b. What would be the optimal order quantity if the carrying cost were Rs 0.50 a filter per month?
- c. What would be the optimal order quantity if order costs were Rs 10?

**Illustration 3 [Illustration A, B, C]**

The demand for a certain product is random. It has been estimated that the monthly demand of the product has a normal distribution with a mean of 390 units. The unit price of product is Rs. 25. Ordering cost is Rs. 40 per order and inventory carrying cost is estimated to be 35 percent per year.

Required: Calculate Economic Order Quantity (EOQ).

**Illustration 4 [Marvel]**

Marvel Limited uses a large quantity of salt in its production process. Annual consumption is 60,000 tonnes over a 50-week working year. It costs Rs. 100 to initiate and process an order and delivery follow two weeks later. Storage costs for the salt are estimated at 10 paise per tonne per annum. The current practice is to order twice a year when the stock falls to 10,000 tonnes. Recommend an appropriate ordering policy for Marvel Limited and contrast it with the cost of the current policy.

## ILLUSTRATIONS (ACCOUNT RECEIVABLE)

### Illustration 1 [XYZ Ltd]

XYZ Corporation is considering relaxing its present credit policy and is in the process of evaluating two proposed policies. Currently, the firm has annual credit sales 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 receivables. The company's variable costs are 70% of the selling price. Given the following information, which is the better option?

(Amount in Rs.)

	Present policy	Policy Option I	Policy Option II
Annual credit sales	50,00,000	60,00,000	67,50,000
Accounts receivable turnover ratio	4 times	3 times	2.4 times
Bad debt losses	1,50,000	3,00,000	4,50,000

### Illustration 2 [Trader]

A trader whose current sales are in the region of Rs. 6 lakhs per annum and an average collection period of 30 days wants to pursue a more liberal policy to improve sales. A study made by a management consultant reveals the following information.

Credit Policy	Increase in collection period	Increase in sales	Present default anticipated
A	10 days	Rs. 30,000	1.5%
B	20 days	Rs. 48,000	2%
C	30 days	Rs. 75,000	3%
D	45 days	Rs. 90,000	4%

The selling price per unit is Rs. 3. Average cost per unit is Rs. 2.25 and variable costs per unit are Rs. 2. The current bad debt loss is 1%. Required return on additional investment is 20%. Assume a 360 days year. Which of the above policies would you recommend for adoption?

### Illustration 3 [Mosaic]

Mosaic Limited has current sales of Rs.15 lakhs per year. Cost of sales is 75 per cent of sales and bad debts are one per cent of sales. Cost of sales comprises 80 per cent variable costs and 20 per cent fixed costs, while the company's required rate of return is 12 per cent. Mosaic Limited currently allows customers 30 days' credit but is considering increasing this to 60 days' credit in order to increase sales. It has been estimated that this change in policy will increase sales by 15 per cent, while bad debts will increase from one per cent to four per cent. It is not expected that the policy change will result in an increase in fixed costs and creditors and stock will be unchanged.

Should Mosaic Limited introduce the proposed policy? (Assume 360 days year)

### Illustration 4 [PQR Ltd]

PQR Ltd. having an annual sale of Rs. 30 Lakhs is reconsidering its present Collection Policy. At present, the average collection period is 50 days and bad debt losses are 5% of sales. The company is incurring expenditure of Rs. 30,000 on account of collection of receivables. Cost of funds is 10%. The alternative policies are as under

	Alternative I	Alternative II
Avg. Collection Period	40 days	30 Days
Bad debt losses	4% of Sales	3% of sales
Collection Expenses	Rs. 60,000	Rs. 95,000

Evaluate the alternatives on the basis of the incremental approach and state which alternative is more beneficial

### Illustration 5 [Bad Debts & ROI]

As a part of the strategy to increase sales and profits, the sales manager of a company proposes to sell goods to a group of new customers with 10% risk of non-payment. This group would require one and a half months credit and is likely to increase sales by Rs. 1,00,000 p.a. Production and Selling expenses amount to 80% of sales and the income-

tax rate is 50%. The company's minimum required rate of return (after tax) is 25%. Should the sales manager's proposal be accepted?

Also find the degree of risk of non-payment that the company should be willing to assume if the required rate of return (after tax) were (i) 30%, (ii) 40% and (iii) 60%.

### Illustration 6 [Slow Players]

Slow Payers are regular customers of Goods Dealers Ltd., Calcutta and have approached the sellers for extension of a credit facility for enabling them to purchase goods from Goods Dealers Ltd. On an analysis of past performance and on the basis of information supplied, the following pattern of payment schedule emerges in regard to Slow Payers:

	Pattern of Payment Schedule
At the end of 30 days	15% of the bill
At the end of 60 days	34% of the bill.
At the end of 90 days	30% of the bill.
At the end of 100 days	20% of the bill.
Non-recovery	1% of the bill.

Slow Payers want to enter into a firm commitment for purchase of goods of Rs. 15 lakhs in 2013, 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. 5 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? Workings should form part of your answer. Assume year of 360 days.

### Illustration 7 [Saavan Ltd]

Saavan Ltd. currently has sales of Rs. 30 Lakhs, with an average collection period of 2 months. At present, no discounts are offered to the customers. The management of the company is thinking to allow a discount of 2% on cash sales which will result as under;

- i. The average collection period will reduce to 1 month.
- ii. 50% of customers would take advantage of 2% discount.

The company would normally require 25% return on investment. Advise the management, whether to extend discount on cash sales.

### Illustration 8 [Factoring]

A Factoring firm has credit sales of Rs. 360 lakhs and its average collection period is 30 days. The financial controller estimates, bad debt losses are around 2% of credit sales. The firm spends Rs. 1,40,000 annually on debtor's administration. This cost comprises of telephonic and fax bills along with salaries of staff members. These are the avoidable costs. A Factoring firm has offered to buy the firm's receivables. The factor will charge 1% commission and will pay an advance against receivables on an interest @15% p.a. after withholding 10% as reserve. What should the firm do?

Assume 360 days in a year

### Illustration 9 [Dolce Company]

The Dolce Company purchases raw materials on terms of 2/10, net 30. A review of the company's records by the owner, Mr. Gupta, revealed that payments are usually made 15 days after purchases are received. When asked why the firm did not take advantage of its discounts, the accountant, Mr. Ram, replied that it cost only 2 per cent for these funds, whereas a bank loan would cost the company 12 per cent.

1. What mistake is Ram making?
2. What is the real cost of not taking advantage of the discount?
3. If the firm could not borrow from the bank and was forced to resort to the use of trade credit funds, what suggestion might be made to Ram that would reduce the annual interest cost?

### Illustration 10 [Q4: Nov 2018\*]

MN Ltd. has

Current turnover of Rs. 30,00,000 p.a.
Cost of Sales is 80% of turn over
Bad debts are 2% of turnover
Cost of sales include 70% variable cost and 30% fixed cost
Company required rate of return is 15%

- MN Ltd. currently allows 15 days credit to its customers, but it is considering increasing this to 45 days credit in order to increase turnover.
  - It has been estimated that this change in policy will increase turnover by 20%, while Bad Debts will increase by 1%.
  - It is not expected that the policy change will result in an increase in fixed cost and creditors and stock will be unchanged.
- Should MN Ltd. introduce the proposed policy? (assume 360 days)

#### Illustration 11 [Q6: May 2020 RTP\*]

TM Limited, a manufacturer of Colour TV sets is considering the liberalization of existing credit terms to three of their large customers A, B and C. The credit period and likely quantity of TV sets that will be sold to the customers in addition to the other sales are as follows:

Credit Period (Days)	Quantity sold (No. of TV Sets)		
	A	B	C
0	10,000	10,000	-
30	10,000	15,000	-
60	10,000	20,000	10,000
90	10,000	25,000	15,000

The selling price per TV set is Rs. 15,000. The expected contribution is 50% of the selling price. The cost of carrying receivable averages 20% per annum.

You are required compute the credit period to be allowed to each customer. (Assume 360 days in a year for calculation purposes).

#### Illustration 12

A company is presently having credit sales of ₹ 12 lakh. The existing credit terms are 1/10, net 45 days and average collection period is 30 days. The current bad debts loss is 1.5%. In order to accelerate the collection process further as also to increase sales, the company is contemplating liberalization of its existing credit terms to 2/10, net 45 days. It is expected that sales are likely to increase by 1/3 of existing sales, bad debts increase to 2% of sales and average collection period to decline to 20 days. The contribution to sales ratio of the company is 22% and opportunity cost of investment in receivables is 15 percent (pre-tax). 50 per cent and 80 percent of customers in terms of sales revenue are expected to avail cash discount under existing and liberalization scheme respectively. The tax rate is 30%. ADVISE, should the company change its credit terms? (Assume 360 days in a year).

### ILLUSTRATIONS (ACCOUNT PAYABLE)

#### Illustration 1

Suppose ABC Ltd. has been offered credit terms from its major supplier of 2/10, net 45. Hence the company has the choice of paying Rs.98 per Rs.100 or to invest Rs.98 for an additional 35 days and eventually pay the supplier Rs.100 per Rs.100. The decision as to whether the discount should be accepted depends on the opportunity cost of investing Rs.98 for 35 days. What should the company do?

#### Illustration [Q6 May 2018 RTP (New Syllabus)\*]

- A Ltd. is in the manufacturing business and it acquires raw material from X Ltd. on a regular basis.
- As per the terms of agreement the payment must be made within 40 days of purchase.

- However, A Ltd. has a choice of paying ₹ 98.50 per ₹ 100 it owes to X Ltd. on or before 10th day of purchase.

**Required:**

Examine whether A Ltd. should accept the offer of discount assuming average billing of A Ltd. with X Ltd. is ₹ 10,00,000 and an alternative investment yield a return of 15% and company pays the invoice.

## ILLUSTRATION ON FINANCING OF WORKING CAPITAL

### Illustration 1 [MBPF Introduction]

From the following data, calculate the maximum permissible bank finance under the three methods suggested by the Tandon Committee: -

Current Assets	Rs. in Lakhs	Current Liabilities	Rs. In Lakhs
Raw Material	180	Creditors	120
Work-in-Progress	60	Other current Liabilities	40
Finished Goods	100	Bank borrowings	250
Receivables	150		
Other Current Assets	20		
<b>Total</b>	<b>510</b>	<b>Total</b>	<b>410</b>

The total Core Current Assets (CCA) are Rs. 200 Lakhs.

### Illustration 2 [Working Capital & MBPF]

A company has applied to the Commercial Bank for financing its working capital requirements. The following information is available about the projections for the current year:

Elements of cost:	Per unit (Rs.)
Raw Material	40
Direct Labour	15
Overhead	30
Total Cost	<b>85</b>
Profit	15
Sales	<b>100</b>

#### Other information:

1. Raw material in stock: average 4 weeks consumption,
2. Work – in progress (completion stage, 50 per cent), on an average half a month.
3. Finished goods in stock: on an average, one month.
4. Credit allowed by suppliers is one month.
5. Credit allowed to debtors is two months.
6. Average time lag in payment of wages is 1½ weeks and 4 weeks in overhead expenses.
7. Cash in hand and at bank is desired to be maintained at Rs. 50,000.

All Sales are on credit basis only.

#### Required:

- i. Prepare **statement showing estimate of working capital** needed to finance an activity level of 96,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overhead accrue similarly. For the calculation purpose 4 weeks may be taken as equivalent to a month and 52 weeks in a year.
- ii. **Compute the Maximum Permissible Bank Finance (MPBF)** to the company as per the lending norms of Tandon Committee, under all the 3 methods (assuming the core current assets of the company are 25% of the current assets)

### Illustration 3 [Balance Sheet and WC]

The following figures and ratios are related to a company:

(i)	Sales for the year (all credit)	Rs. 30,00,000
(ii)	Gross Profit ratio	25%

(iii)	Fixed assets turnover (based on cost of goods sold)	1.5
(iv)	Stock turnover (based on cost of goods sold)	6
(v)	Liquid ratio	1:1
(vi)	Current ratio	1.5:1
(vii)	Debtors collection period	2 months
(viii)	Reserves and surplus to Share capital	0.6:1
(xi)	Capital gearing ratio	0.5
(x)	Fixed assets to net worth	1.20:1

You are required to prepare:

- Balance Sheet of the company on the basis of above details.
- The statement showing working capital requirement, if the company wants to make a provision for contingencies @ 10% of net working capital including such provision

#### Illustration 4 [XYZ Ltd (Cash Cost Basis)]

The following **annual** figures relate to XYZ Co.,

Particulars	Amount (Rs.)
Sales (at two months' credit)	36,00,000
Materials consumed (suppliers extend two months' credit)	9,00,000
Wages paid (1-month lag in payment)	7,20,000
Cash manufacturing expenses (expenses are paid one month in arrear)	9,60,000
Administrative expenses (1-month lag in payment)	2,40,000
Sales promotion expenses (paid quarterly in advance)	1,20,000

The company sells its products on gross profit of 25%. Depreciation is considered as a part of the cost of production. It keeps one month's stock each of raw materials and finished goods, and a cash balance of Rs.1,00,000. Assuming a 20% safety margin, work out the working capital requirements of the company on cash cost basis. Ignore work-in-progress.

#### Illustration 5 [PQ Ltd]

PQ Ltd. a company **newly** commencing business in 2017 has the following projected Profit and Loss Account. Prepare an estimate of working capital using the information provided.

	(Rs.)	(Rs)
Sales		2,10,000
Cost of goods sold		1,53,000
Gross Profit		57,000
Administrative Expenses	14,000	
Selling Expenses	13,000	27,000
Net Profit		30,000
The cost of goods sold has been arrived at as under:		
Materials used	84,000	
Wages and manufacturing Expenses	62,500	
Depreciation	23,500	
	1,70,000	
<b>Less: Stock of Finished goods (10% of goods produced not yet sold)</b>	(17,000)	
<b>COGS</b>	1,53,000	

The figure given above relate only to finished goods and not to work-in-progress. Goods equal to 15% of the year's production (in terms of physical units) will be in process on the average requiring full materials but only 40% of the other expenses. The company believes in keeping materials equal to two months consumption in stock.

- Suppliers of materials will extend 1.5 months credit.
- Sales will be 20% for cash and the rest at two months credit.
- The company wishes to keep Rs. 8,000 in cash.
- 10% has to be added to the estimated figure for unforeseen contingencies.



Prepare an estimate of working capital  
 Note: All workings should form part of the answer.

**Illustration 5 [PQ Ltd Part 6]**

<b>Changes in the assumptions:</b>	
1.	All expenses will be paid one month in advance
2.	Provision for tax is Rs.10,000
3.	70% of income tax is paid in advance on quarterly basis

**Illustration 6 [Aneja Ltd]**

Aneja Limited, a **newly formed company**, has applied to the commercial bank for the first time for financing its working capital requirements. The following information is available about the projections for the current year:  
 Estimated level of activity: 1,04,000 completed units of production + 4,000 units of work-in-progress.  
 Based on the above activity, estimated cost per unit is:

<b>Raw Material</b>	Rs. 80 per unit
<b>Direct wages</b>	Rs. 30 per unit
<b>Overheads (Exclusive of depreciation)</b>	Rs. 60 per unit
<b>Total cost</b>	Rs. 170 per unit
<b>Selling price</b>	Rs. 200 per unit

Raw materials in stock: Average 4 weeks consumption, work-in-progress (assume 50% completion stage in respect of conversion cost) (materials issued at the start of the processing).

Finished goods in stock	8,000 units
Credit allowed by suppliers	Average 4 weeks
Credit allowed to debtors/receivables	Average 8 weeks
Lag in payment of wages	Average 1.5 weeks
Cash at banks is expected to be (for smooth operation)	Rs. 25,000

Assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly. All sales are on credit basis only.

You are required to calculate the net working capital required.

**Illustration 7 [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:

<b>Particulars</b>	<b>Amount in Rs.</b>
Raw material	20
Direct Labour	15
Manufacturing Overheads:	25
Variable 15	
Fixed 10	
Selling and Distribution overheads:	4
Variable 3	
Fixed 1	
<b>Total cost</b>	<b>64</b>
Profit	16
<b>Selling price</b>	<b>80</b>

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..... 1.5 months.
- iii. Credit allowable by creditors..... 4 months.
- iv. Lag in payment of wages..... 1 month.
- v. Lag in payment of overheads.....0.5 month.
- vi. Cash in hand and Bank is expected to be Rs. 60,000.

vii. Provision for contingencies is required @ 10% of working capital requirement including that provision. You are required to prepare a projected statement of working capital requirement for the first year of operations. Debtors are taken at cost.

**Illustration 8 [Q7 May 2018 RTP\*]**

Following information is forecasted by the Puja Limited for the year ending 31st March, 2018

	Balance as at 1st April, 2017 (₹)	Balance as at 31st March, 2018 (₹)
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.

Calculate:

- (i) Net operating cycle period.
- (ii) Number of operating cycles in the year.
- (iii) Amount of working capital requirement using operating cycles.

**Illustration 9**

PREPARE a working capital estimate to finance an activity level of 52,000 units a year (52 weeks) based on the following data:

- Raw Materials - ₹ 400 per unit
- Direct Wages - ₹ 150 per unit
- Overheads (Manufacturing) - ₹ 200 per unit
- Overheads (Selling & Distribution) - ₹ 100 per unit

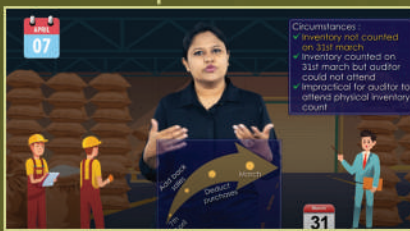
Selling Price - ₹ 1,000 per unit, Raw materials & Finished Goods remain in stock for 4 weeks, Work in process takes 4 weeks. Debtors are allowed 8 weeks for payment whereas creditors allow us 4 weeks.

Minimum cash balance expected is ₹ 50,000. Receivables are valued at Selling Price.

## Our Approach

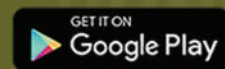
We go to great lengths to ensure that we deliver a quality learning experience to our students. Right from pedagogy design to faculty selection, video recording and animation, at every stage our goal is to ensure that the final output is the BEST and it meets the requirements of the learners. It is our laser sharp focus on maintaining HIGH QUALITY and setting new benchmarks in the CA education domain, that make our efforts stand out and help our students to succeed in their examinations.

## A Glimpse of our e-learning modules



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