CA INTERMEDIATE

FINANCIAL MANAGEMENT

QUICK REVISION BOOK

By

CA. NAMIT ARORA SIR

This book is dedicated to my Parents

Mr. S. K. ARORA

&

Mrs. Raman Arora

INDEX

CHAPTER 1 CAPITAL STRUCTURE – EBIT & EPS ANALYSIS

1. **EBIT & EPS Analysis:** Finance manager has to select best Capital Structure or Financing Plan which provides highest EPs & MPS out of many financing Plans.

2. **Proforma Statement Showing EBIT, EPS & MPS:**

Particulars	₹
Sales	XXX
Less: Variable Cost	(XXX)
Contribution	XXX
Less: Fixed Cost	(XXX)
Operating Profit or EBIT	XXX
Less: Interest on long term debt	(XXX)
EBT	XXX
Less: Tax	(XXX)
EAT	XXX
Less: Preference Dividend	(XXX)
Earnings available for Equity Shareholders	XXX
÷ No. of Equity shares	÷ XX
EPS	XXX
× PE Ratio	× XX
MPS	XXX

Note:

- MPS = EPS × PE Ratio
- Number of Equity Shares = Existing Shares + New Shares
- New Equity Shares = $\frac{\text{Additional Funds Raised through Equity}}{\text{Net Proceeds from One Equity Share}}$
- Net Proceeds from Share = Issue Price – Issue Expenses

Note: If nothing is specified in the question, MPS is assumed to be Issue Price.

Note: If nothing is specified in the question and we have both MPS & EPS then decision should be based on MPS.

3. **Selection of plan on the basis of EPS or MPS (New company):**

Statement of EPS & MPS

Particulars	Alternatives		
	Equity	Equity - Debt	Equity - Preference
EBIT	XXX	XXX	XXX
Less: Interest	-	(XXX)	-
EBT	XXX	XXX	XXX
Less: Tax	(XXX)	(XXX)	(XXX)
EAT	XXX	XXX	XXX
Less: Preference Dividend	-	-	(XXX)
Earning For Equity	XXX	XXX	XXX
÷ No. of Equity shares	÷ XX	÷ XX	÷ XX
EPS	XXX	XXX	XXX
MPS (EPS × PE Ratio)	XXX	XXX	XXX

4. Selection of plan on the basis of EPS or MPS (Existing company):

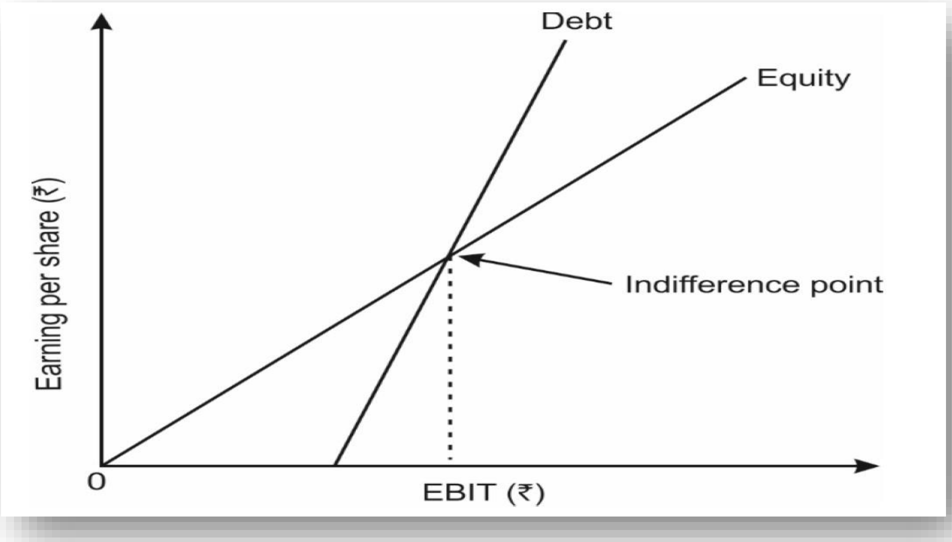
Statement of EPS & MPS

Particulars	Alternatives		
	Equity	Debt	Preference
EBIT	XXX	XXX	XXX
Less: Interest:			
Existing	(XXX)	(XXX)	(XXX)
New	-	(XXX)	-
EBT	XXX	XXX	XXX
Less: Tax	(XXX)	(XXX)	(XXX)
EAT	XXX	XXX	XXX
Less: Preference Dividend:			
Existing	(XXX)	(XXX)	(XXX)
New	-	-	(XXX)
Earning For Equity	XXX	XXX	XXX
÷ No. of Equity shares	÷ XX	÷ XX	÷ XX
(Existing + New)	(XX + XX)	(XX + NIL)	(XX + NIL)
EPS	XXX	XXX	XXX
MPS (EPS × PE Ratio)	XXX	XXX	XXX

5. Indifference Point: Indifference point refers the level of EBIT at which EPS under two different options are same.

EPS under option 1 = EPS under option 2

$$\frac{(EBIT - I_1)(1-t) - PD_1}{N_1} = \frac{(EBIT - I_2)(1-t) - PD_2}{N_2}$$



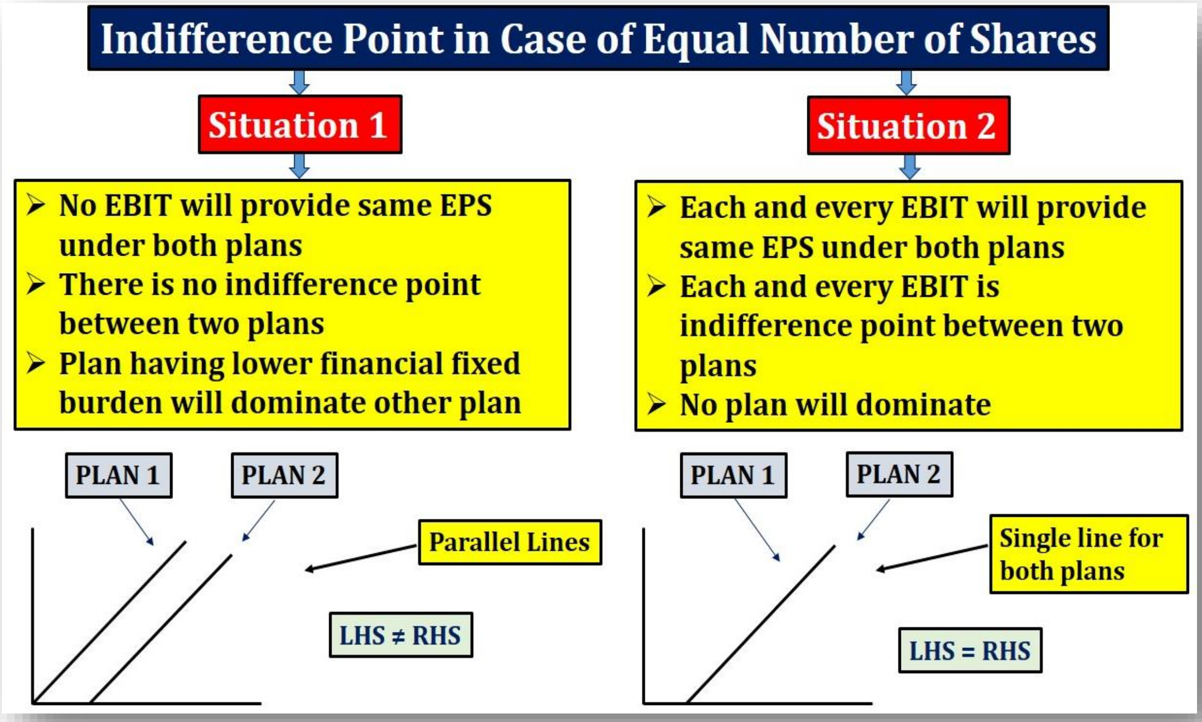
➢ **Course of Action:**

Situations	Action
Expected EBIT < Indifference Point	Select option having lower Fixed Financial Burden
Expected EBIT = Indifference Point	Select any option
Expected EBIT > Indifference Point	Select option having higher Fixed Financial Burden

6. ***Financial Break Even Point:*** *It is the level of EBIT at which EPS will be zero.*

$$EBIT = Interest + \frac{Preference\ Dividend}{(1-t)}$$

7. ***Indifference Point in case of Equal Number of Share:***



CHAPTER 2 LEVERAGES

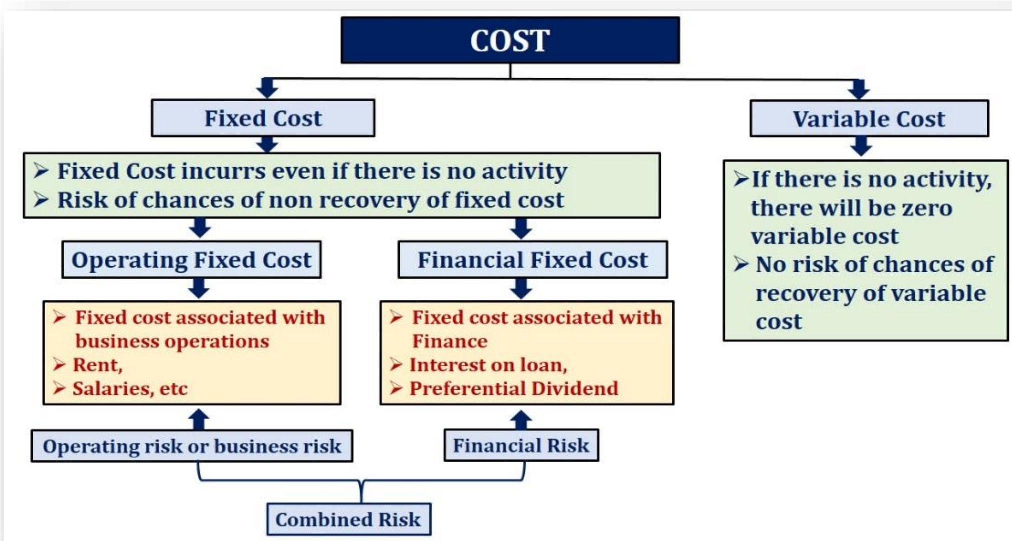
1. Leverage Technique: *The term leverage represents influence or power. Leverage is the technique which is used to evaluate risk associated with any business organisation. The term Leverage in general refers to a relationship between two interrelated variables. In financial analysis it represents the influence of one financial variable over some other related financial variable. These financial variables may be costs, output, sales revenue, Earnings Before Interest and Tax (EBIT), Earning per share (EPS) etc.*

2. Types of Risk: *There are two types of risk: (a) Business Risk and (b) Financial Risk:*

*(a) **Business Risk:** It refers to the risk associated with firm's operations. It is the uncertainty about the future operating income (EBIT).*

*(b) **Financial Risk:** It refers to the additional risk placed on the firm's equity shareholders because of use debt, preference shares or both. It is the uncertainty about the future EPS.*

3. Types of Cost and Risk:



4. Understanding of Various Leverage

Particulars	₹	Relationship
Sales	*XXX*	
Less: Variable Cost	*(XXX)*	
Contribution	*XXX*	**OL**
Less: Fixed Cost (Operating Risk)	*(XXX)*	
Operating Profit or EBIT	*XXX*	
Less: Interest (Financial Risk)	*(XXX)*	
EBT	*XXX*	**CL**
Less: Tax	*(XXX)*	
EAT	*XXX*	**FL**
Less: Preference Dividend (Financial Risk)	*(XXX)*	
Earning for Equity	*XXX*	
÷ No. of Equity shares	*÷ XX*	
EPS	*XXX*	

5. Types of Leverages:

LEVERAGE TECHNIQUE

Operating Leverage

- It is the relationship between "SALES and EBIT"
- It indicates business risk associated with organisation
- Higher the operating leverage, higher the operating risk

Financial Leverage

- It is the relationship between "EBIT and EPS"
- It indicates financial risk associated with organisation
- Higher the financial leverage, higher the financial risk

Combined Leverage

- It is the relationship between "SALES and EPS"
- It indicates combined risk associated with organisation
- Higher the combined leverage, higher the combined risk

6. Degree of Operating Leverage or Operating Leverage:

Operating leverage is used to measure operating or business risk associated with any business organisation, DOL indicates % change in EBIT occurs due to a given % change in Sales.

- *If OL is 2.5 times, 1% increase in sales would result in 2.5% increase in EBIT.*

Formulae:

Formula 1 Operating Leverage $= \dfrac{Contribution}{EBIT}$

Formula 2 Operating Leverage $= \dfrac{\%\ Change\ in\ EBIT}{\%\ Change\ in\ Sales}$

Formula 3 Operating Leverage $= \dfrac{Combined\ Leverage}{Financial\ Leverage}$

Formula 4 Operating Leverage $= \dfrac{1}{MOS\ Sale\ Proportion}$

Notes:

- *OL can never be between 0 and 1.*
- *Higher the fixed cost, higher the BEP, Higher the OL and higher the operating risk.*
- *No operating fixed cost means no operating risk.*
- *Higher the proportion of MOS, lower the OL and lower operating risk.*

7. Degree of Financial Leverage or Financial Leverage:

Financial leverage is used to measure financial risk associated with any business organisation. DFL indicates % change in EPS occurs due to a given % change in EBIT.

- *If FL is 5 times, 1% increase in EBIT would result in 5% increase in EPS.*

Formulae:

Formula 1 Financial Leverage $= \dfrac{EBIT}{EBT - \frac{PD}{1-T}}$

Formula 2 *Financial Leverage* = $\frac{\%\ \text{Change in EPS}}{\%\ \text{Change in EBIT}}$

Formula 3 *Financial Leverage* = $\frac{\text{Combined Leverage}}{\text{Operating Leverage}}$

Notes:

- *FL can never be between 0 and 1.*
- *Higher the Financial fixed cost (interest and preference dividend), higher the Financial BEP, Higher the FL and higher the Financial risk.*
- *No Financial fixed cost means no Financial risk.*

8. *Degree of Combined Leverage or Combined Leverage:* *Combined leverage is used to measure combined risk associated with any business organisation. DCL indicates % change in EPS occurs due to a given % change in Sales.*

- *If CL is 2 times, 1% increase in Sales would result in 2% increase in EPS.*

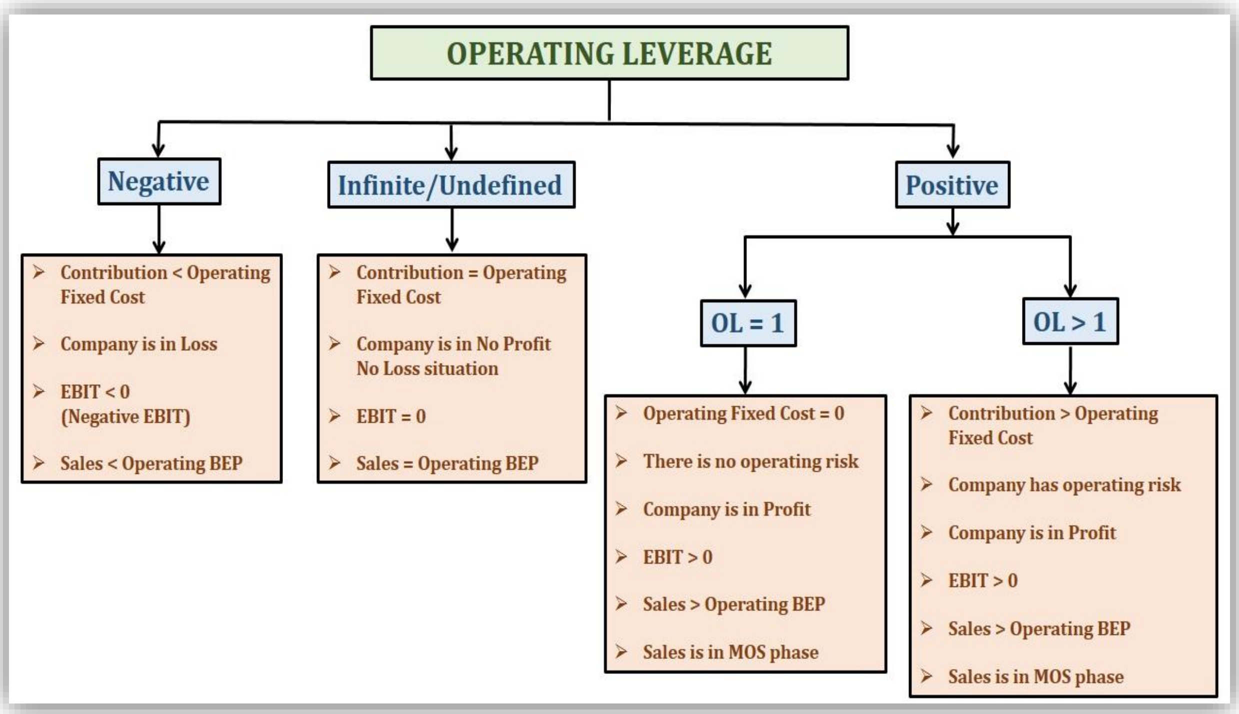
Formulae:

Formula 1 *Combined Leverage* = $\frac{\text{Contribution}}{EBT - \frac{PD}{1-T}}$

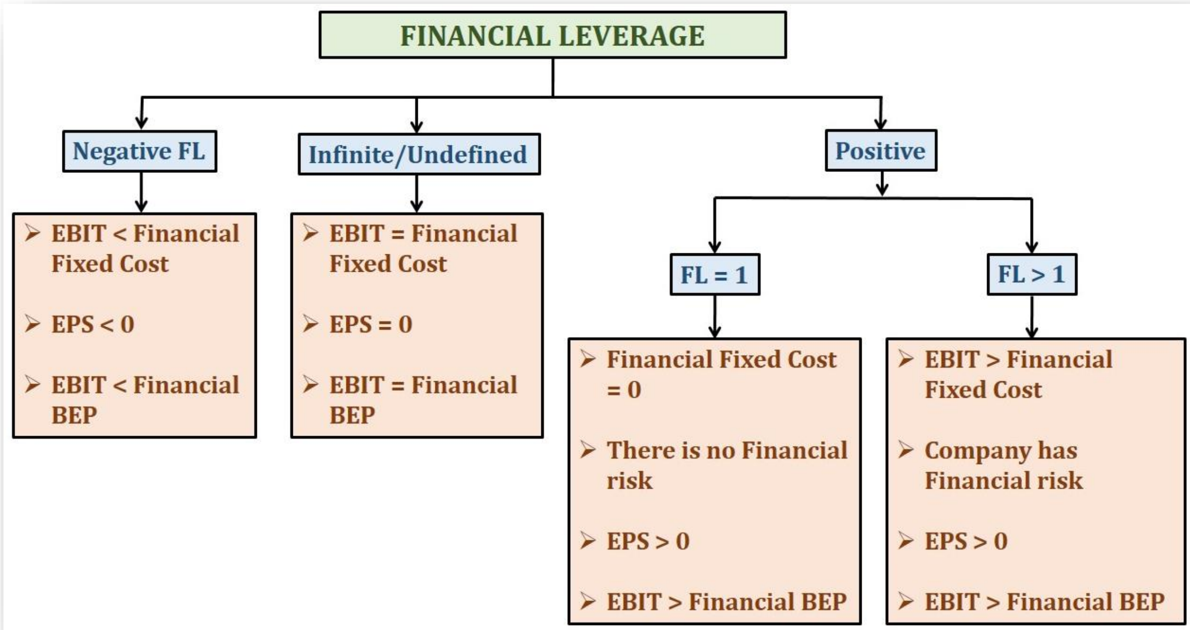
Formula 2 *Combined Leverage* = $\frac{\%\ \text{Change in EPS}}{\%\ \text{Change in Sales}}$

Formula 3 *Combined Leverage* = $OL \times FL$

9. *Operating Leverage Different Cases:*



10. *Financial Leverage Different Cases:*



11. *Effect of Financial Leverage on Equity Investors:*

EFFECT OF FINANCIAL LEVERAGE

EFFECT OF USE OF DEBT

SITUATION	EFFECT
ROI > Rate of interest	Favourable
ROI = Rate of interest	Indifference
ROI < Rate of interest	Unfavourable

EFFECT OF USE OF PREFERENCE SHARE CAPITAL

SITUATION	EFFECT
ROI (1 - t) > Rate of PD	Favourable
ROI (1 - t) = Rate of PD	Indifference
ROI (1 - t) < Rate of PD	Unfavourable

12. ***Financial Leverage as a 'Double edged Sword':*** *When the cost of 'fixed cost fund' is less than the return on investment, financial leverage will help to increase return on equity and EPS. The firm will also benefit from the saving of tax on interest on debts etc. However, when cost of debt will be more than the return it will affect return of equity and EPS unfavourably and as a result firm can be under financial distress. Therefore, financial leverage is also known as "double edged sword".*

13. ***Trading on Equity:*** *A firm is known to have a positive/favourable leverage when its earnings are more than the cost of debt. If earnings are equal to or less than cost of debt, it will be an negative/unfavourable leverage. When the quantity of fixed cost fund is relatively high in comparison to equity capital it is said that the firm is ''trading on equity".*

CHAPTER 3 MANAGEMENT OF RECEIVABLES & PAYABLES

1. ***Management of Receivables:*** *Management of receivables refers to planning and controlling of 'debt' owed to the firm from customer on account of credit sales. It is also known as trade credit management. The basic objective of management of receivables (debtors) is to optimise the return on investment on these assets. When large amounts are tied up in receivables, there are chances of bad debts and there will be cost of collection of debts. On the contrary, if the investment in receivables is low, the sales may be restricted, since the competitors may offer more liberal terms. Therefore, management of receivables is an important issue and requires proper policies and their implementation. Management of receivables provides an answer to the following questions:*

   - *Whether credit should be allowed or not?*
   - *To whom credit should be allowed?*
   - *How much amount of credit should be allowed?*
   - *How much credit period should be allowed?*

2. ***Evaluation of Credit Policies (Total Approach):***

Statement of Evaluation of Credit Policies (Total Approach)

Particulars	Existing	Option 1	Option 2
Annual credit sales	XXX	XXX	XXX
Less: Variable cost	(XXX)	(XXX)	(XXX)
Less: Fixed cost	(XXX)	(XXX)	(XXX)
Profit before bad debts and admin cost	XXX	XXX	XXX
Less: Bad debts and Cash Discount	(XXX)	(XXX)	(XXX)
Less : Cost of administration	(XXX)	(XXX)	(XXX)
Expected Profit Before Tax	XXX	XXX	XXX
Less: Cost of funds before Tax	(XXX)	(XXX)	(XXX)
Net Benefit Before Tax	XXX	XXX	XXX
Less: Tax	(XXX)	(XXX)	(XXX)
Net Benefit After Tax	XXX	XXX	XXX

Select the option having higher net benefit.

Notes:

- *If tax is given in the question and:*
  a. *Cost of fund or Required return or Opportunity cost if before tax: It must be deducted before tax.*
  b. *Cost of fund or Required return or Opportunity cost if after tax: It must be deducted after tax.*

- *Cost of fund or Required return or Opportunity cost is calculated on the basis of total of Variable and Fixed cost related to credit sales and Bad debt, cash discount and credit admin cost are ignored.*

- *Cost of fund or Required return or opportunity cost is calculated as given below:*

  Formula 1 = $(\text{Variable cost} + \text{Fixed cost}) \times \frac{ACP}{365/52/12} \times \text{Rate}$

  Formula 2 = $(\text{Variable cost} + \text{Fixed cost}) \times \frac{1}{DTR} \times \text{Rate}$

  Formula 3 = *Cost of Debtors × Rate*

- *Average collection period is used to calculate Cost of fund when question provides both average collection period and credit period allowed to debtors.*

3. Evaluation of Credit Policies (Incremental Approach)

Statement of Evaluation of Credit Policies (Incremental Approach)

Particulars	Existing	Option 1	Option 2
Annual credit sales	XXX	XXX	XXX
Less: Variable cost	(XXX)	(XXX)	(XXX)
Less: Fixed cost	(XXX)	(XXX)	(XXX)
Profit before bad debts and admin cost	XXX	XXX	XXX
(A) Incremental Profit before bad debts and admin cost	-	XXX	XXX
Bad debts	XXX	XXX	XXX
(B) Incremental Bad debts	-	XXX	XXX
Cash discount	XXX	XXX	XXX
(C) Incremental Cash discount	-	XXX	XXX
Cost of administration	XXX	XXX	XXX
(D) Incremental Cost of administration	-	XXX	XXX
(E) Incremental Expected Profit Before Tax (A – B – C – D)	-	XXX	XXX
Cost of funds before tax	XXX	XXX	XXX
(F) Incremental Cost of funds before Tax	-	XXX	XXX
Incremental Net Benefit Before Tax (E - F)	-	XXX	XXX
Less: Tax	-	(XXX)	(XXX)
Incremental Net Benefit After Tax	-	XXX	XXX

Select the option having higher Incremental net benefit.

4. Meaning of Cash Discount with line: '$^x/_y$' net 'z' days or $^1/_{10}$ net 45 days:

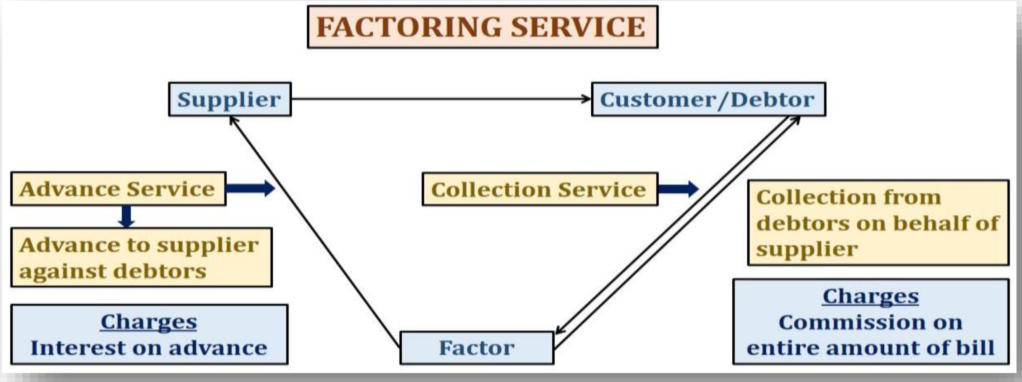
It means: if the bill is paid within 10 days, there is a 1% cash discount, otherwise, the total amount is due within 45 days"

5. Annual % of Cost of Cash Discount

$$\text{Annual \% of Cost of Cash Discount} = \frac{\text{Cash Discount}}{100 - \text{Cash discount}} \times \frac{365}{T} \times 100$$

6. Factoring Service:

Factoring is an agreement between factor and business firm. Factor provides various services to business firm as per the factoring agreement.



7. Types of Factoring Services:

(a) **Collection service:** Factor collects amount from debtors on behalf of business firm and charge commission on total bill amount.

(b) **Advance service:** Factor collects amount from debtors on behalf of business firm and charge commission and also gives advance to business firm against bill amount and charge interest.

(c) **Non-recourse factoring:** Factor suffers loss of bad debts under such arrangement.

(d) **Recourse factoring:** Business firm suffers loss of bad debts under such arrangement.

(e) **Finance factoring:** Factor gives advance to business firm against bill amount and charge interest.

(f) **Non notification factoring:** Receivables are not aware about factoring agreement.

8. Steps in case of Collection Factoring Service:

Step 1: Calculate savings due to factoring proposal.
Step 2: Calculate cost due to factoring proposal.
Step 3: Calculate net benefit or loss and take decision accordingly.

Proforma Statement of Evaluation of Factoring Proposal

Particulars	₹
(A) Savings:	
Saving in administration cost	XXX
Saving in bad debts	XXX
*Saving in cost of debtors (if any)	XXX
Total (A)	XXX
(B) Cost:	
Annual charges	XXX
Any other charges or cost	XXX
Total (B)	XXX
Net Benefit or Loss (A -B)	XXX

9. Steps in case of Advance Factoring Service:

Step 1: Calculate amount of advance:

Calculation of Amount of Advance

Particulars	₹
Average receivables	XXX
Less: Factor reserve	(XXX)
Less: Commission	(XXX)
Amount available for advance	XXX
Less: Interest on amount available for advance before interest	(XXX)
Amount of Advance	XXX

Step 2: Calculate Effective cost of Factoring (Annual):

Statement of Effective Cost of Factoring to the Firm (Annual)

Particulars	₹
(1) Cost of factoring:	
Annual Factoring commission	XXX
Annual Interest charges	XXX
Total (1)	XXX
(2) Savings:	
Annual Saving in credit administration cost	XXX
Annual Saving in bad debts	XXX
Total (2)	XXX
Effective cost of factoring (1 - 2)	XXX
Rate of effective cost (Effective Cost/Amount of Advance) × 100	XX%

Step 3: Compare Rate of Effective cost with Rate of Bank interest and take decision accordingly.

10. Assumptions in numerical questions of Factoring Service:

- Bad debts will be saved
- Credit administration cost will be saved
- Commission and interest are payable in advance/upfront.

11. Management of payables: There is an old age saying in business that if you can buy well then you can sell well. Management of your creditors and suppliers is just as important as the management of your debtors. Trade creditor is a general source of finance in the sense that it arises from ordinary business transaction. But 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. Creditors are a vital part of effective cash management and should be managed carefully to enhance the cash position.

In management of payables we take decision of taking or ignoring cash discount facility.

Annual % of Cost of Cash Discount $= \frac{\text{Cash Discount}}{100 - \text{Cash discount}} \times \frac{365}{T} \times 100$

CHAPTER 4 MANAGEMENT OF WORKING CAPITAL

1. **Working Capital:** Working capital refers to funds invested in Stock of Raw Material, WIP, Finished Goods, Debtors, BR, and Prepaid etc. net of current liabilities"

- Gross Working Capital = Current Assets
- Net Working Capital = Current Assets – Current Liabilities

2. **Permanent working capital:** The minimum level of investment in the current assets that is carried by the entity at all times to carry its day to day activities.

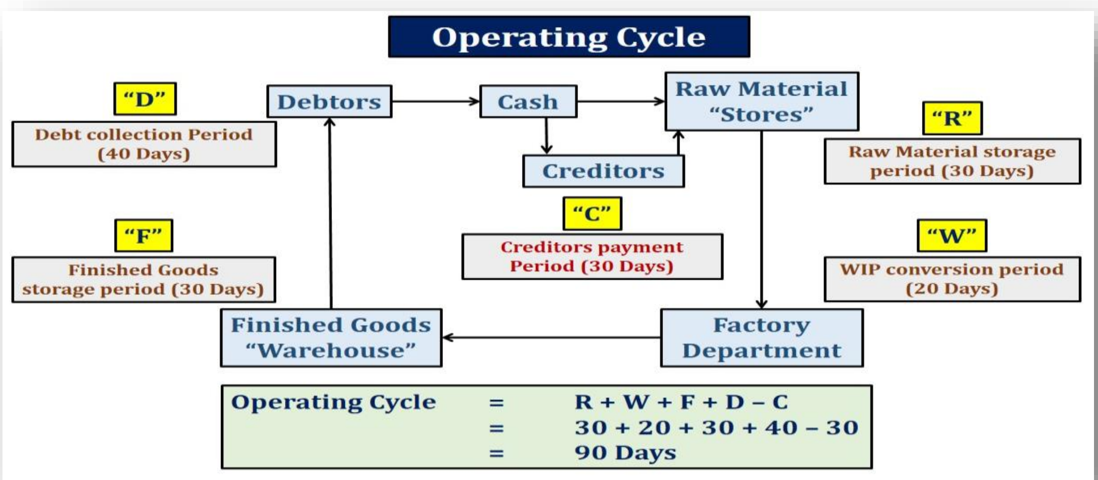
3. **Temporary working capital:** It is used to finance the short term working capital requirements which arises due to fluctuation in sales volume. It is in additional of permanent working capital"

4. **Estimation of Working Capital:**

Method 1: Operating or Working Capital Cycle Method

Method 2: Component wise Estimation or Quantitative Estimation Method

5. **Operating or Working Capital Cycle Method:**



Step 1: Estimate Various Holding Period:

(a) Raw Material Storage Period = $\dfrac{\text{Average Stock of Raw Materials}}{\text{Annual Raw Material Consumption}} \times 365$

(b) Work in Progress holding period = $\dfrac{\text{Average Stock of WIP}}{\text{Annual Cost of Production}} \times 365$

(c) Finished Goods storage period = $\dfrac{\text{Average Stock of Finished Goods}}{\text{Annual Cost of Goods Sold}} \times 365$

(d) Receivables collection period = $\dfrac{\text{Average Receivables}}{\text{Annual Credit Sales}} \times 365$

(e) Credit period allowed by suppliers = $\dfrac{\text{Average Payables}}{\text{Annual Credit Purchase}} \times 365$

Step 2: *Calculate Operating Cycle Period:*

Operating Cycle Period = R + W + F + D - C

Step 3: *Estimate Working Capital:*

Formula 1 = $\frac{\text{Annual Operating Cost}}{365} \times \text{Operating Cycle Period} + \text{Desired Cash}$

Formula 2 = $\frac{\text{Annual Operating Cost}}{\text{Number of Operating Cycle in one year}} + \text{Desired Cash}$

6. Component-wise Estimation Method:

Step 1: *Prepare Projected Income Statement*

Step 2: *Prepare Statement of Estimated Working Capital*

Proforma Statement of Working Capital Requirement

Particulars		₹
(A) Current Assets:		
Raw materials		XXX
Work in progress:		
Material	XXX	
Labour	XXX	
Overheads	XXX	XXX
Finished goods		XXX
Debtors		XXX
Prepaid		XXX
Cash and Bank		XXX
Other Current assets		XXX
Total (A)		XXX
(B) Current Liabilities:		
Creditors		XXX
Outstanding labour		XXX
Outstanding overhead		XXX
Other current liabilities		XXX
Total (B)		XXX
Working Capital Before Safety Margin (A - B)		XXX
Add : Safety Margin		XXX
Working Capital After Safety Margin		XXX

7. Valuation of Items Under Total and Cash Cost Approach:

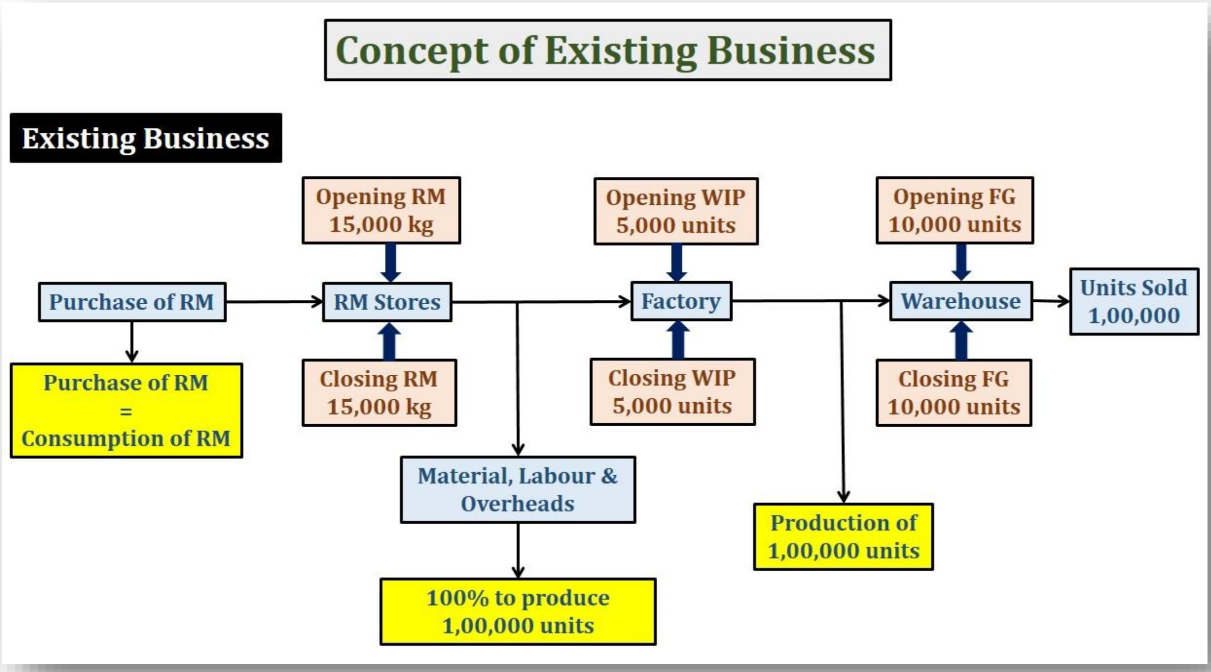
Items Current Assets	Total Approach	Cash Cost Approach
Raw Material Stock	Valued on the basis of Raw Material Consumed	Valued on the basis of Raw Material Consumed
WIP Stock:		
Materials	Valued on the basis of Raw Material Consumed	Valued on the basis of Raw Material Consumed
Wages	On the basis of Wages Cost	On the basis of Wages Cost
Production OH	On the basis of Production OH (including Depreciation)	On the basis of Production OH (excluding Depreciation)

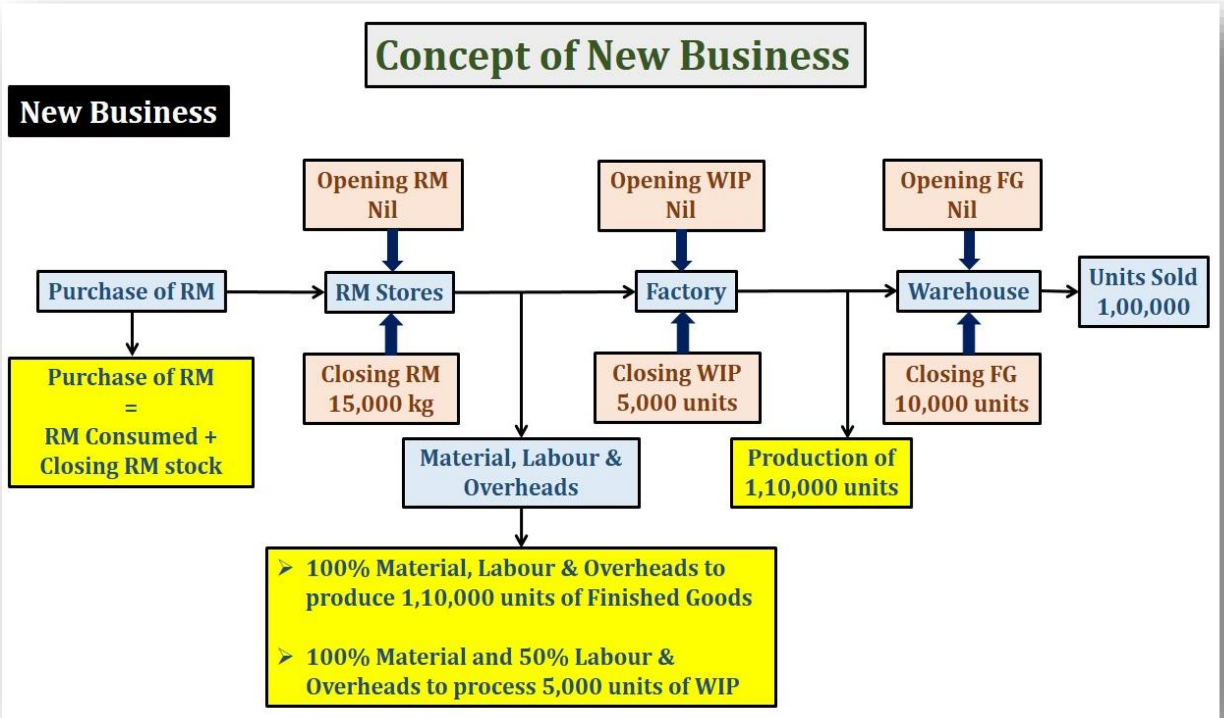
Finished Goods Stock	*Valued on the basis of Cost of Production (including Depreciation)*	*Valued on the basis of Cost of Production (excluding Depreciation)*
Debtors: Alternative 1	*Valued on the basis of cost of credit sales (including Depreciation)*	*Valued on the basis of cost of credit sales (excluding Depreciation)*
Alternative 2	*Valued on the basis of credit sales*	*N. A.*
Prepaid Wages	*On the basis of Wages Cost*	*On the basis of Wages Cost*
Prepaid Overheads	*On the basis of OH (excluding Depreciation)*	*On the basis of OH (excluding Depreciation)*
Cash and Bank	*As per given information*	*As per given information*
Items* / *Current Liabilities	***Total Approach***	***Cash Cost Approach***
Creditors	*On the basis of credit purchases*	*On the basis of credit purchases*
Outstanding Wages	*On the basis of Wages Cost*	*On the basis of Wages Cost*
Outstanding Overheads	*On the basis of OH (excluding Depreciation)*	*On the basis of OH (excluding Depreciation)*

Notes:

- *Depreciation can never be outstanding or prepaid*
- *Debtors can be valued on cost of credit sales (preferred) or amount of credit sales under total approach*
- *Depreciation and profit are fully ignored under cash cost approach*
- *Assumption in respect of % of completion of WIP:*
  - *Material cost* 100%
  - *Labour cost* 50%
  - *Production overheads* 50%
- *If nothing is specified, it is preferred to use total approach*

8. Working Capital Estimation Charts of Existing and New Business:





***Note:** In case of new company Purchase of RM = RM consumed + Closing RM stock*

9. Methods of MPBF as Per Mr. P. L. Tandon's Tandon Committee (1974):

Methods	Maximum Permissible Bank Finance (MPBF)
Method I	75% of (Current Assets Less Current Liabilities) i.e. 75% of Net Working Capital
Method II	(75% of Current Assets) Less Current Liabilities
Method III	(75% of Soft Current Assets or other than Core Current Assets) Less Current Liabilities

***Note:** During the computation of MPBF current liabilities must be excluding existing bank finance.*

10. Impact of Double Shift:

Items	Impact
Production and Sales	Double
Variable Cost	Double
Fixed Cost	No change
Raw Material Stock	Double in quantity and value subject to quantity discount
WIP stock	No change in units
Finished Goods Stock	Double in quantity, lower than double in value due to fixed cost
Debtors	Double
Prepaid (Variable cost)	Double
Prepaid (Fixed cost)	No change
Creditors	Double subject to quantity discount
Outstanding (Variable cost)	Double
Outstanding (Fixed cost)	No change

CHAPTER 5 TREASURY & CASH MANAGEMENT

1. Management of Cash:

Step 1: Prepare cash budget for coming period
Step 2: Take action for coming period on the basis of cash budget

SITUATIONS	PLANNING
Budgeted Cash Balance < Desired Cash Balance (Deficit Cash)	Plan to arrange cash to fulfill deficiency of cash (Like: Sell of marketable securities or arrangement of overdraft etc.)
Budgeted Cash Balance = Desired Cash Balance (Sufficient Cash)	No action
Budgeted Cash Balance > Desired Cash Balance (Surplus Cash)	Plan to invest surplus cash (Like: Purchase of marketable securities or invest surplus cash elsewhere)

Proforma Cash Budget

Particulars	October	November	December	Total
Opening balance	XXX	XXX	XXX	XXX
Collections:				
Cash sales	XXX	XXX	XXX	XXX
Collection from debtors etc.	XXX	XXX	XXX	XXX
Other receipts	XXX	XXX	XXX	XXX
Total A	XXX	XXX	XXX	XXX
Payments:				
Cash purchase	XXX	XXX	XXX	XXX
Payment to creditors	XXX	XXX	XXX	XXX
Salaries and wages	XXX	XXX	XXX	XXX
Overheads, rent, tax etc.	XXX	XXX	XXX	XXX
Other payments	XXX	XXX	XXX	XXX
Total B	XXX	XXX	XXX	XXX
Closing balance (A - B)	XXX	XXX	XXX	XXX
Add: Arrangement of Cash	XXX	-	-	XXX
Less: Investment of Cash	-	(XXX)	-	(XXX)
Adjusted closing balance	XXX	XXX	XXX	XXX

2. Cash Cycle = F + D – C

3. Cash Turnover = 12 months (365 days) ÷ Cash Cycle Period

4. William J. Baumol's Economic Order Quantity Model, (1952):
According to this model, optimum cash level is that level of cash where the total of annual carrying costs and transactions costs are the minimum.

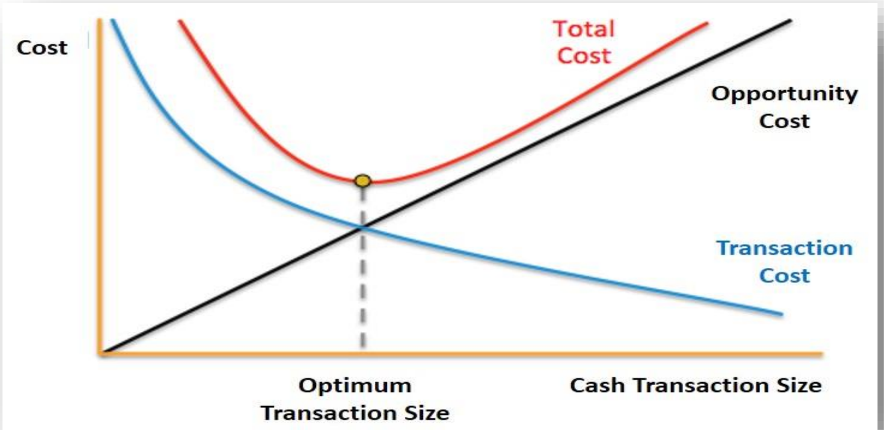
Optimum Cash Transaction (C) = $\sqrt{\frac{2U \times P}{S}}$

Where,

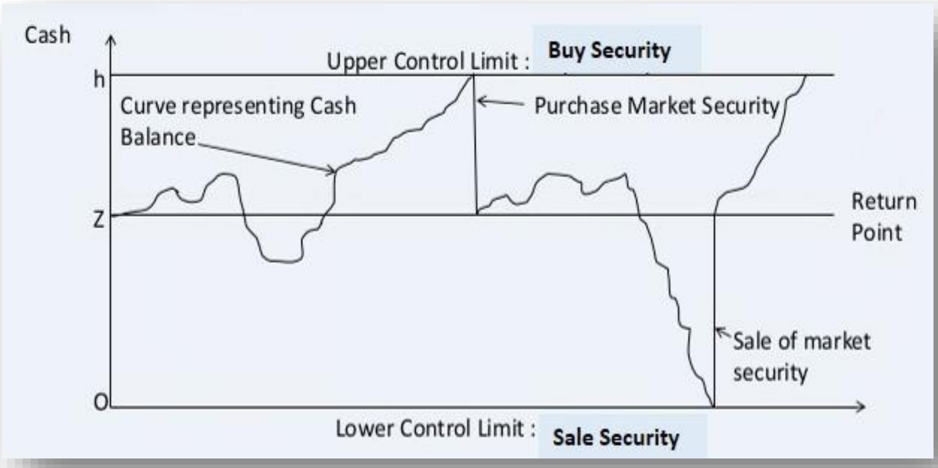
C	=	*Optimum cash balance*
U	=	*Annual cash disbursement*
P	=	*Fixed cost per transaction*
S	=	*Opportunity cost of one rupee p.a.*

The model is based on the following assumptions:

- *Cash needs of the firm are known with certainty.*
- *The cash is used uniformly over a period of time and it is also known with certainty.*
- *The holding cost is known and it is constant.*
- *The transaction cost also remains constant.*



5. Miller-Orr Cash Management Model (1966): *According to this model the net cash flow is completely stochastic. In this model control limits are set for cash balances. These limits may consist of h as upper limit, z as the return point; and zero as the lower limit"*



- *When the cash balance reaches the upper limit, the transfer of cash equal to h – z is invested in marketable securities account.*

- *When it touches the lower limit, a transfer from marketable securities account to cash account is made.*

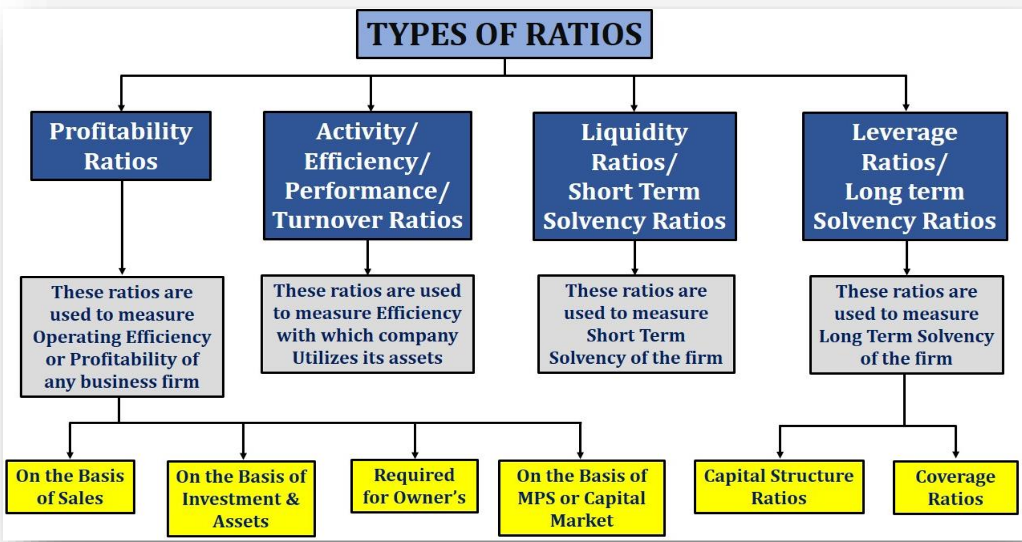
- *During the period when cash balance stays between (h, z) and (z, 0) i.e. high and low limits no transactions between cash and marketable securities account is made.*

CHAPTER 6 RATIO ANALYSIS

1. ***Financial/Account 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 accounting figures.*

2. ***Ratio Analysis:*** *Ratio analysis is a relationship expressed in mathematical terms between two individual figures or group of figures connected with each other in some logical manner and are selected from financial statements of the concern to draw conclusions about the performance (past, present and future), strengths & weaknesses of a firm and can take decisions in relation to the firm.*

3. ***Types of Ratios:***



4. ***Profitability Ratios:*** *The profitability ratios measure the profitability or the operational efficiency of the firm. Profitability ratios are broadly classified in four categories:*

- *Profitability Ratios related to Sales.*
- *Profitability Ratios related to overall Return on Investment/Assets.*
- *Profitability Ratios required for Analysis from Owner's Point of View.*
- *Profitability Ratios related to Market/ Valuation/ Investors.*

(A) Profitability Ratios Related to Sales:

(a) ***Gross Profit (G.P.) Ratio*** $= \frac{\text{Gross Profit}}{\text{Sales}} \times 100$

(b) ***Net Profit (N.P.) Ratio:***

(i) ***After Tax*** $= \frac{\text{Net Profit/EAT}}{\text{Sales}} \times 100$

(ii) ***Before Tax*** $= \frac{\text{Earning Before Tax (EBT)}}{\text{Sales}} \times 100$

(c) *Operating Profit Ratio* = $\frac{\text{Operating Profit}}{\text{Sales}} \times 100$ or = $\frac{\text{EBIT}}{\text{Sales}} \times 100$

(d) *Expense Ratio:*

(i) *COGS Ratio* = $\frac{\text{COGS}}{\text{Sales}} \times 100$

(ii) *Operating Expense Ratio* = $\frac{\text{Operating Expenses}}{\text{Sales}} \times 100$

(iii) *Operating Ratio* = $\frac{\text{COGS+ Operating Expenses}}{\text{Sales}} \times 100$

(iv) *Financial Expenses Ratio* = $\frac{\text{Financial Expenses}}{\text{Sales}} \times 100$

(B) Profitability Ratios Related to Overall Return on Investment or Assets:

(a) Return on Assets (ROA):

(i) *Formula 1* = $\frac{\text{EBIT }(1-t)}{\text{Average Total Assets/Average Tangible Assets/Average Fixed Assets}} \times 100$

(ii) *Formula 2* = $\frac{\text{Net Profit (EAT)}}{\text{Average Total Assets/Average Tangible Assets/Average Fixed Assets}} \times 100$

(iii) *Formula 3* = $\frac{\text{Net Profit (EAT) + Interest}}{\text{Average Total Assets/Average Tangible Assets/Average Fixed Assets}} \times 100$

(b) Return on Investments (ROI):

(1) Return on Capital Employed (ROCE):

(i) *Pre Tax (Before Tax)* = $\frac{\text{EBIT}}{\text{Average Capital Employed}} \times 100$

(ii) *Post Tax (After Tax)* = $\frac{\text{EBIT }(1-t)}{\text{Average Capital Employed}} \times 100$

(2) Return on Shareholders Fund = $\frac{\text{EAT}}{\text{Average Shareholders Fund}} \times 100$

(3) Return on Equity (ROE) = $\frac{\text{EAT − Preference Dividend}}{\text{Equity Share Holders' Fund}} \times 100$

(C) Profitability Ratios Required For Analysis From Owner's Point of View:

(a) *Earnings Per Share (EPS)* = $\frac{\text{EAT − Preference Dividend}}{\text{No. of Equity Shares Outstanding}}$

(b) *Dividend Per Share (DPS)* = $\frac{\text{Equity Dividend}}{\text{No. of Equity Shares Outstanding}}$

(c) *Dividend Payout Ratio (DP)* = $\frac{\text{DPS}}{\text{EPS}} \times 100$

(d) *Earnings Retention Ratio* $= \frac{\text{EPS} - \text{DPS}}{\text{EPS}} \times 100$

(D) *Profitability Ratios Related to Market/ Valuation/ Investors:*

(a) *Price Earnings Ratio (P/E Ratio)* $= \frac{\text{Market Price Per Share (MPS)}}{\text{Earning Per Share (EPS)}}$

(b) *Dividend Yield Ratio* $= \frac{\text{Dividend Per Share (DPS)}}{\text{Market Price Per Share (MPS)}} \times 100$

(c) *Earnings Yield Ratio* $= \frac{\text{Earnings Per Share (EPS)}}{\text{Market Price Per Share (MPS)}} \times 100$

(d) *Market Value/Book Value (MVBV)* $= \frac{\text{Market Value Per Share}}{\text{Book Value Per Share}}$

(e) *Q Ratio* $= \frac{\text{Market Value of Equity and Liabilities}}{\text{Estimated Replacement Cost of Assets}}$

5. *Return on Capital Employed (ROCE) as per Du Pont Model:*

Return on Capital Employed (ROCE) = Operating Profit Margin × Capital Turnover

6. *Return on Equity (ROE) as per Du Pont Model:*

Return on Equity (ROE) = Net Profit Margin × Asset Turnover × Equity Multiplier

7. *Activity/ Efficiency/ Performance/Turnover/Velocity Ratios:* *These ratios are employed to evaluate the efficiency with which the firm manages and utilises its assets.*

(a) *Total Assets Turnover Ratio* $= \frac{\text{Sales/COGS}}{\text{Average Total Assets}}$

(b) *Fixed Assets Turnover Ratio* $= \frac{\text{Sales/COGS}}{\text{Average Fixed Assets}}$

(c) *Capital/Net Asset Turnover Ratio* $= \frac{\text{Sales/COGS}}{\text{Average Capital Employed}}$

(d) *Current Assets Turnover Ratio* $= \frac{\text{Sales/COGS}}{\text{Average Current Assets}}$

(e) *Working Capital Turnover Ratio* $= \frac{\text{Sales/COGS}}{\text{Average Working Capital}}$

(f) *Receivables Turnover Ratio* $= \frac{\text{Annual Net Credit Sales}}{\text{Average Accounts Receivable}}$

(g) *Receivables Velocity* $= \frac{\text{Average Accounts Receivables}}{\text{Average Daily/Monthly/Weekly Net Credit Sales}}$

Or

$= \frac{\text{12 Months/ 52 weeks/ 365 Days}}{\text{Receivables Turnover Ratio}}$ *Or*

$= \frac{\text{Average Accounts Receivables}}{\text{Annual Net Credit Sales}} \times 365/52/12$

(h) **Payables Turnover Ratio** = $\frac{\text{Annual Net Credit Purchase}}{\text{Average Accounts Payables}}$

(i) **Payables Velocity** = $\frac{\text{Average Accounts Payables}}{\text{Average Daily/Monthly/Weekly Net Credit Purchase}}$

Or

= $\frac{\text{12 Months/ 52 weeks/ 365 Days}}{\text{Payables Turnover Ratio}}$ **Or**

= $\frac{\text{Average Accounts Payables}}{\text{Annual Net Credit Purchase}} \times 365/52/12$

(j) **Inventory (Finished Stock) Turnover** = $\frac{\text{COGS/Sales}}{\text{Average FG Inventory}}$

(k) **Inventory (Finished Stock) Velocity** = $\frac{\text{Average FG Inventory}}{\text{Average Daily/Monthly/Weekly COGS}}$ **Or**

= $\frac{\text{12 Months/ 52 weeks/ 365 Days}}{\text{FG Inventory Turnover Ratio}}$ **Or**

= $\frac{\text{Average FG Inventory}}{\text{Annual COGS}} \times 365/52/12$

(l) **Inventory (WIP) Turnover** = $\frac{\text{COP}}{\text{Average WIP Inventory}}$

(m) **Inventory (WIP) Velocity** = $\frac{\text{Average WIP Inventory}}{\text{Average Daily/Monthly/Weekly COP}}$ **Or**

= $\frac{\text{12 Months/ 52 weeks/ 365 Days}}{\text{WIP Inventory Turnover Ratio}}$ **Or**

= $\frac{\text{Average WIP Inventory}}{\text{Annual COP}} \times 365/52/12$

(n) **Inventory (RM) Turnover** = $\frac{\text{Raw Material Consumed}}{\text{Average RM Inventory}}$

(o) **Inventory (RM) Velocity** = $\frac{\text{Average RM Inventory}}{\text{Average Daily/Monthly/Weekly RMC}}$ **Or**

= $\frac{\text{12 Months/ 52 weeks/ 365 Days}}{\text{RM Inventory Turnover Ratio}}$ **Or**

= $\frac{\text{Average RM Inventory}}{\text{Annual RMC}} \times 365/52/12$

8. **Liquidity/ Short Term Solvency Ratios:** *These ratios are used to measure short term solvency of the firm.*

(a) **Current Ratio** = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

(b) **Quick/Acid test/Liquid Ratio** = $\frac{\text{Quick/ Liquid Assets}}{\text{Current Liabilities}}$

Quick Assets or Liquid Assets = *Current Assets – Stock (All) - Prepaid*

(c) ***Cash Ratio/Absolute Liquidity Ratio*** = $\frac{\text{Cash and Cash Equivalent}}{\text{Current Liabilities}}$

(d) ***Basic Defense Interval*** = $\frac{\text{Cash and Cash Equivalent}}{\text{Daily Cash Operating Cost}}$

(e) ***Net Working Capital Ratio*** = ***Current Assets – Current Liabilities (Excluding short term bank borrowing)***

9. *Long Term Solvency Ratios/Leverages Ratios:* ***These ratios are used to measure long term solvency (stability) and structure of the firm.***

(A) *Capital Structure Ratios:*

(a) ***Equity Ratio*** = $\frac{\text{Equity Fund}}{\text{Capital Employed}}$

(b) ***Debt Ratio*** = $\frac{\text{Long Term Debt/Total Debt/Total Outside Liabilities}}{\text{Capital Employed}}$

(c) ***Debt to Equity Ratio*** = $\frac{\text{Long Term Debt/Total Debt/Total Outside Liabilities}}{\text{Equity Fund}}$

(d) ***Debt to Total Assets Ratio*** = $\frac{\text{Long Term Debt/Total Debt/Total Outside Liabilities}}{\text{Total Assets}}$

(e) ***Capital Gearing Ratio*** = $\frac{\text{Preference Share Capital} + \text{Debentures} + \text{Other Borrowed Funds}}{\text{Equity Share Capital} + \text{Reserves \& Surplus} - \text{Losses}}$

(f) ***Proprietary Ratio*** = $\frac{\text{Proprietary Fund}}{\text{Total Assets}}$

(B) *Coverage Ratios:*

(a) ***Interest Coverage Ratio*** = $\frac{\text{EBIT}}{\text{Interest}}$

(b) ***Preference Dividend Coverage Ratio*** = $\frac{\text{EAT}}{\text{Preference Dividend}}$

(c) ***Equity Dividend Coverage Ratio*** = $\frac{\text{EAT} - \text{Preference Dividend}}{\text{Equity Dividend}}$

(d) ***Fixed Charge Coverage Ratio*** = $\frac{\text{EBIT} + \text{Depreciation}}{\text{Interest} + \text{Repayment of Loan}}$

(e) ***Debt Service Coverage Ratio (DSCR)*** = $\frac{\text{Earning Avail. for Debt Services}}{\text{Interest} + \text{Instalments}}$

Notes:

- ***Equity Share Holders Fund or Net Worth:*** ***Equity Share Capital + Reserve and Surplus – Fictitious Assets.***
- ***Shareholders Fund or Owners Fund or Proprietary Fund:*** ***Equity Share Holders' Fund + Preference Share Capital.***
- ***Total Debt or Total Outside Liabilities includes Short and Long term borrowings.***

- *Total Assets must be excluding fictitious assets.*

- *Capital Employed:*

  Alternative 1: Liability Route: Shareholders Fund + Long Term Debt – Non Trade Investments – Capital WIP.

  Alternative 2: Assets Route: Fixed Assets + Long Term trade Investments + Working Capital.

- *If one figure is opted from P/L and another from Balance Sheet then average of Balance Sheet figure shall be taken if possible.*

- *Sales must be excluding indirect tax (GST if any) and net of sales return.*

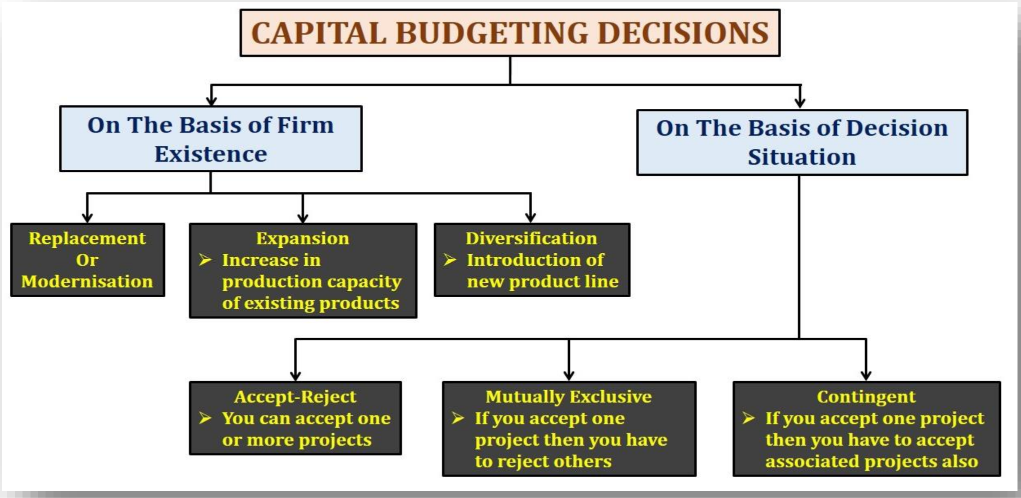
- *In case of Receivable turnover ratio:*

  (i) Credit Sales net of Return including GST is used
  (ii) Debtors before Bad debt or Provision for Doubtful debt is used

- *Operating Expenses = Administration Expenses + Selling Expenses*

CHAPTER 7 INVESTMENT DECISIONS OR CAPITAL BUDGETING

1. *Capital Budgeting Decisions:* *Capital budgeting decision refers to the decision in respect of purchase or sale of fixed assets and long term investment.*

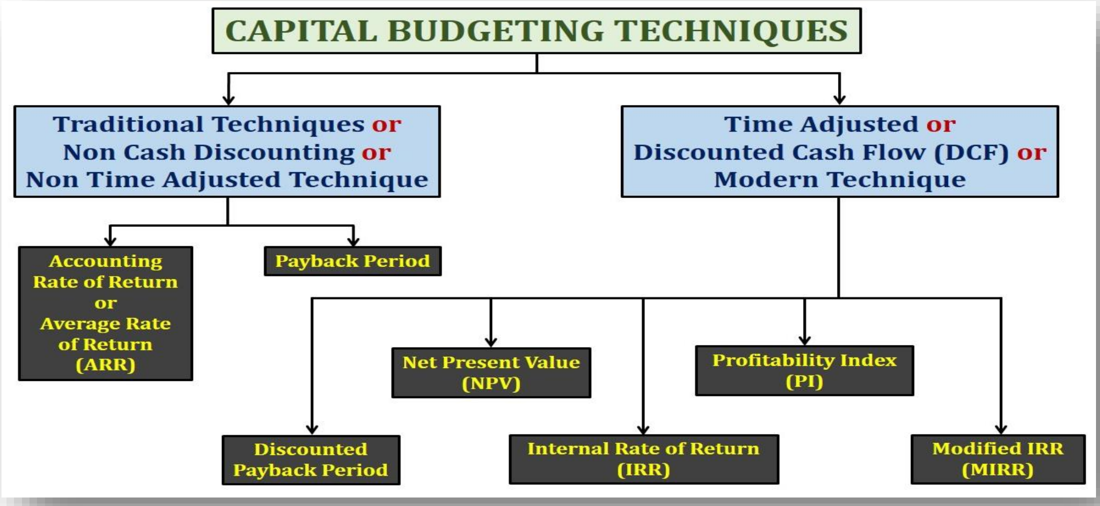


2. *Capital Budgeting:* *Capital budgeting refers to application of appropriate capital budgeting technique (one or more) to evaluate any capital budgeting proposal and take capital budgeting decision.*

3. *Importance of Capital Budgeting Decisions:*

- *Involvement of Substantial Expenditure*
- *Long Term Effect/Growth*
- *Involvement of High Risk*
- *Irreversibility*
- *Complex Decisions*

4. *Capital Budgeting Techniques:*



5. Book Profit VS Cash Flow:

Book Profit: It is also known as accounting profit.
Cash Flow: It is focused on cash inflow and outflow.

Proforma Book Profit and Cash Flow After Tax

Particulars	₹
Sales	XXX
Less: Variable Cost (Always Cash)	(XXX)
Contribution	XXX
Less: Cash Fixed Cost	(XXX)
Less: Depreciation (Non Cash Item)	(XXX)
Profit Before Tax (Accounting or Book Profit)	XXX
Less: Tax	(XXX)
Profit After Tax (Accounting or Book Profit)	XXX
Add: Depreciation (Non Cash Item)	(XXX)
Cash Flow After Tax (CFAT)/Cash Receipts After Tax	XXX

Cash Flow After Tax (CFAT):

- CFAT = PAT + Depreciation
- CFAT = Cash Receipt Before Tax (1 - t) + Depreciation × t
- CFAT = Cash Receipt Before Tax (1 - t) + Tax Shield on Depreciation

6. Cash Flow & Discounted Cash Flow (DCF):

Cash Flow: Cash flow without considering time value of money.

Discounted Cash Flow: Cash flow after considering time value of money.

Discounted Cash Flow (Formulae):

Year 1 = $\frac{C_1}{1+k}$ or C_1 × PVIF or DF for year 1

Year 2 = $\frac{C_2}{(1+k)^2}$ or C_2 × PVIF or DF for year 2

Sum of Discounted Cash Flow (In Case of Equal Inflow Formula):

Σ Discounted Cash Flow = Uniform Cash Flow × PVIFA or Sum of DF/PVF

Notes:

- ARR Technique is based on Accounting/Book Profit
- Payback Period is based on Cash Flow (Non Discounted)
- Discounted Payback, NPV, PI and IRR Techniques are based on Discounted Cash Flow
- MIRR technique if based on Future/Compounded Cash Flow
- Discounted Cash Flow is also known as Present Value of Cash Flow

7. Accounting/Average Rate of Return (ARR): ARR is the rate of return in terms of average book profit on investment. It can be calculated by using one of the following three methods:

Formula 1: ARR (Total Investment Basis) = $\frac{\text{Average Profit p.a.}}{\text{Initial Investment}} \times 100$

Formula 2: ARR (Average Investment Basis) = $\frac{\text{Average Profit p.a.}}{\text{Average Investment}} \times 100$

Formula 3: ARR (Annual Basis):

Step 1: Calculate Annual Rate of Return = $\frac{\text{Profit for the Year}}{\text{Investment at the Beginning of Concern Year}} \times 100$

Step 2: Calculate Average Rate of Return of All Annual ARR in Step 1

Notes:

- *Average Investment* = ½ × (Initial Investment + Salvage) + Addl. Working Capital (If Any)

  Or
- *Average Investment* = (½ × Depreciable Investment) + Salvage + Addl. Working Capital

8. ***Payback Period (Traditional):*** *It is refers to the period within which entire amount of investment is expected to be recovered in form of Cash.*

Situation 1: Uniform Cash Receipts:

Payback Period = $\frac{\text{Initial Investment}}{\text{Annual Cash Inflow}}$

Situation 2: Unequal Cash Receipts:

Step 1: Calculate Cumulative Cash Inflow

Step 2: Calculate Payback Period

9. ***Discounted Payback Period:*** *It is refers to the period within which entire amount of investment is expected to be recovered in form of Discounted Cash.*

Step 1: Calculate Cumulative Discounted Cash Inflow

Step 2: Calculate Discounted Payback Period

10. ***Net Present Value (NPV):*** *The net present value of a project is the amount the investment earns after paying cost of capital in each period.*

NPV = PV of Inflow – PV of Outflow/Initial Investment

Or

NPV = (PI – 1) × PV of Outflow/Initial Investment

11. ***Profitability Index (PI)/ Desirability Factor (DF)/ Present Value Index/ NPV Index Method:***

PI = PV of Inflow ÷ PV of Outflow/Initial investment

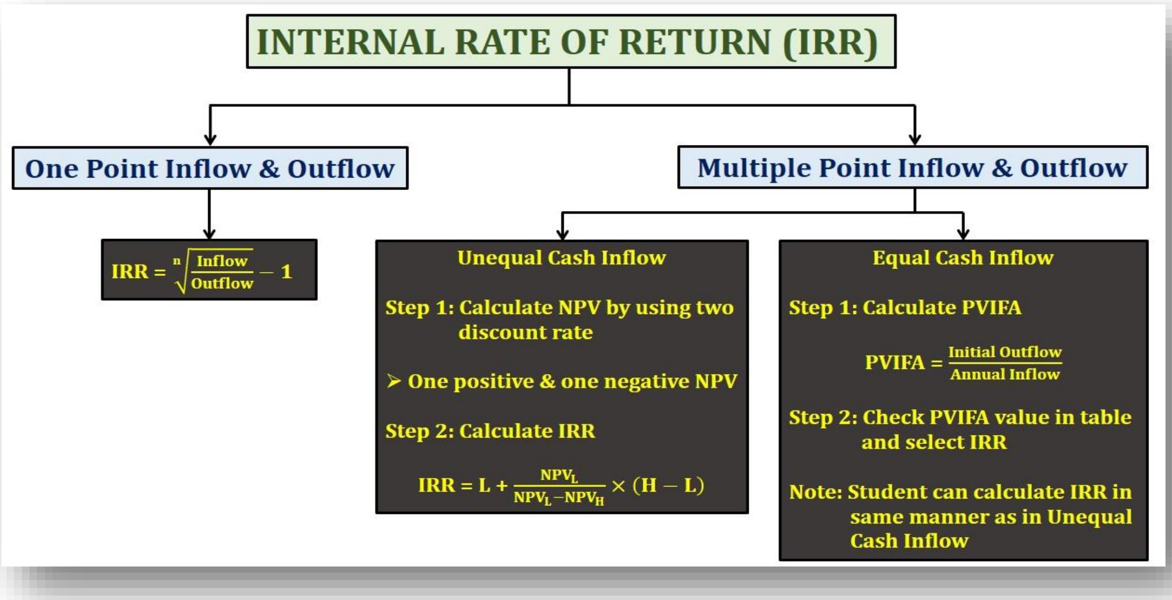
Or

PI = $1 + \frac{\text{NPV}}{\text{Inital Investment/PV of Outflow}}$

Note: PI technique is useful:

- In case of Capital Rationing with indivisible projects
- In case of equal NPV under mutually exclusive projects

12. Internal Rate of Return (IRR): *Internal rate of return refers to the actual rate of return generated by the project. Internal rate of return for an investment proposal is the discount rate that equates the present value of the expected cash inflows with the initial cash outflow. NPV is zero at IRR discount rate*



Situation 1: One Point Inflow:

IRR = $\sqrt[n]{\frac{\text{Inflow}}{\text{Outflow}}} - 1$

Situation 2: Multiple Point Inflow (Unequal Cash):

Step 1: *Calculate one positive and one negative NPV by using random discount rate (Given in question)*

Step 2: *Calculate IRR:* *IRR* = $L + \frac{NPV_L}{NPV_L - NPV_H}(H - L)$

Where,

L	=	Lower Discount Rate
H	=	Higher Discount Rate
NPV_L	=	NPV at Lower Discount Rate
NPV_H	=	NPV at Higher Discount Rate

Situation 3: Multiple Point Inflow (Equal Cash):

Step 1: *Calculate PVIFA at IRR:* $PVIFA_{IRR} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}}$

Step 2: *Calculate IRR on the basis of PVIFA table:*

(a) If matched in table : *Matched PVIFA rate is IRR*

(b) If not matched then:

(i) Calculate one positive and one negative NPV then

(ii) Calculate IRR: $IRR = L + \frac{NPV_L}{NPV_L - NPV_H}(H - L)$

13. *Modified Internal Rate of Return (MIRR)*: *The MIRR is obtained by assuming a single outflow in the zero year and the terminal cash inflow.*

Step 1: *Calculate cumulative compounded value of intermediate cash inflow by using cost of capital as rate of compounding.*

Step 2: *Calculate MIRR:* $MIRR = \sqrt[n]{\frac{\text{Cumulative Compounded Value}}{\text{Initial Investment}}} - 1$

14. *Replacement Decision:* *Decision in respect of replacement of an existing working machine with new one having higher production capacity or lower operating cost or both.*

Step 1: *Calculate Initial Outflow:*

Particulars	*₹*
Purchase Cost of New Machine	*XXX*
Less: Sale Value of Old Machine	*(XXX)*
Less: Tax Saving on Loss on Sale of Old Machine	*(XXX)*
Add: Tax Payment on Profit on Sale of Old Machine	*XXX*
Add: Increase In Working Capital	*XXX*
Less: Decrease in Working Capital	*(XXX)*
Initial Outflow	*XXX*

Step 2: *Calculate Incremental CFAT.*

Step 3: *Calculate Incremental Terminal Value (net of tax).*

Step 4: *Calculate Incremental NPV and Take Replacement Decision.*

15. *Capital Rationing:* *Capital rationing refers to the process of selection of optimal combination of projects out of many subject to availability of funds.*

Situation 1: Projects are Divisible:

Step 1: *Calculate PI of all the available projects*
Step 2: *Give Rank to all projects on the basis of PI*
Step 3: *Select Projects on the basis of Rank*

Situation 2: Projects are Indivisible:

Step 1: *Calculate all possible combinations*
Step 2: *Select combination of projects having higher combined NPV*

16. *Unequal Life of Projects:* *In case of comparison between two projects having different life we can solve the problem by using Equivalent Annualized Criterion:*

Step 1: *Calculate NPV of the projects or PV of outflow of the projects.*

Step 2: *Calculate Equivalent Annualized NPV or Outflow:*

$$\text{Equivalent Annualised NPV or Outflow} = \frac{\text{NPV or PV of Outflow}}{\text{PVIFA}}$$

Step 3: Select the proposal having higher annualised NPV or Lower annualised outflow.

Note: Such problems can also be solved by using Common Life/ Replacement Chain Method

17. Decision Under Various Techniques

Techniques	Yes	No
ARR	ARR ≥ Desired Return	ARR < Desired Return
Traditional Payback	Payback ≤ Desired Payback	Payback > Desired Payback
Discounted Payback	Payback ≤ Desired Payback	Payback > Desired Payback
NPV	NPV ≥ 0	NPV < 0
PI	PI ≥ 1	PI < 1
IRR	IRR ≥ Cost of Capital	IRR < Cost of Capital
MIRR	MIRR ≥ Cost of Capital	MIRR < Cost of Capital

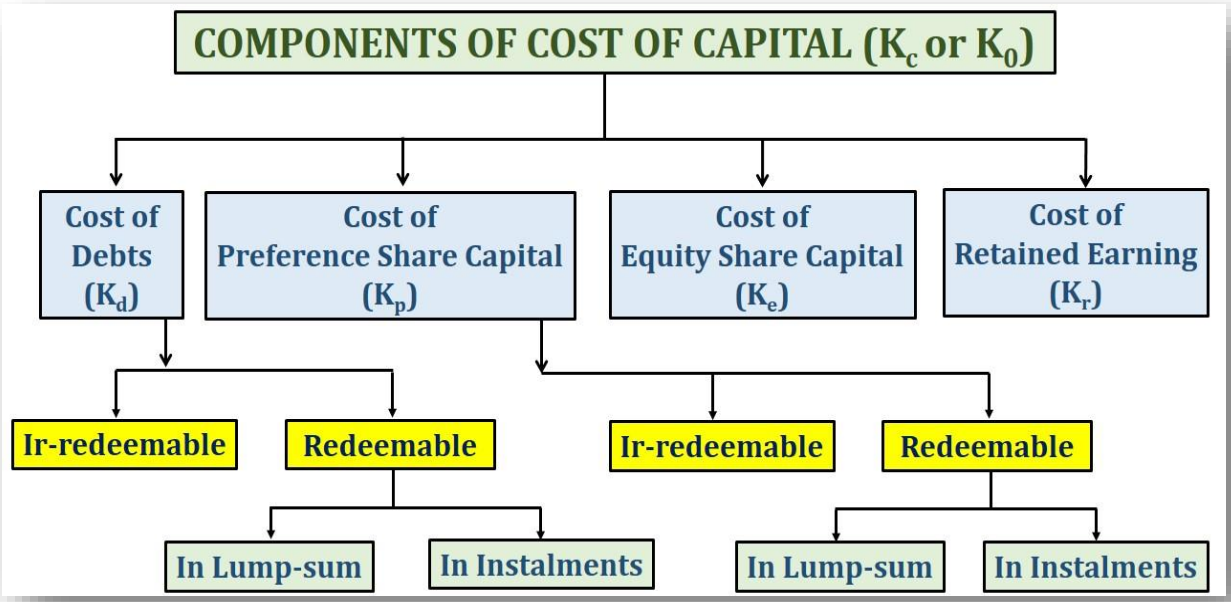
18. Special Points:

- Sunk Cost and Allocated Overheads are irrelevant in Capital Budgeting.
- Opportunity Cost is considered in Capital Budgeting.
- Working Capital introduced at the beginning of project (cash outflow) and recover (cash inflow) at the end of the project life.
- Running Cost : Always Cash Cost.
- Operating Cost : Variable Cost plus Fixed Cost (Including Depreciation) subject to operating cost must be > Depreciation.
- Depreciation : Only as per Tax is relevant.
- Advance Payment: Tax as per accrual basis
- If nothing is specified: Depreciation as per books is assumed to be depreciation as per tax and Losses can be carry forwarded for tax benefit.

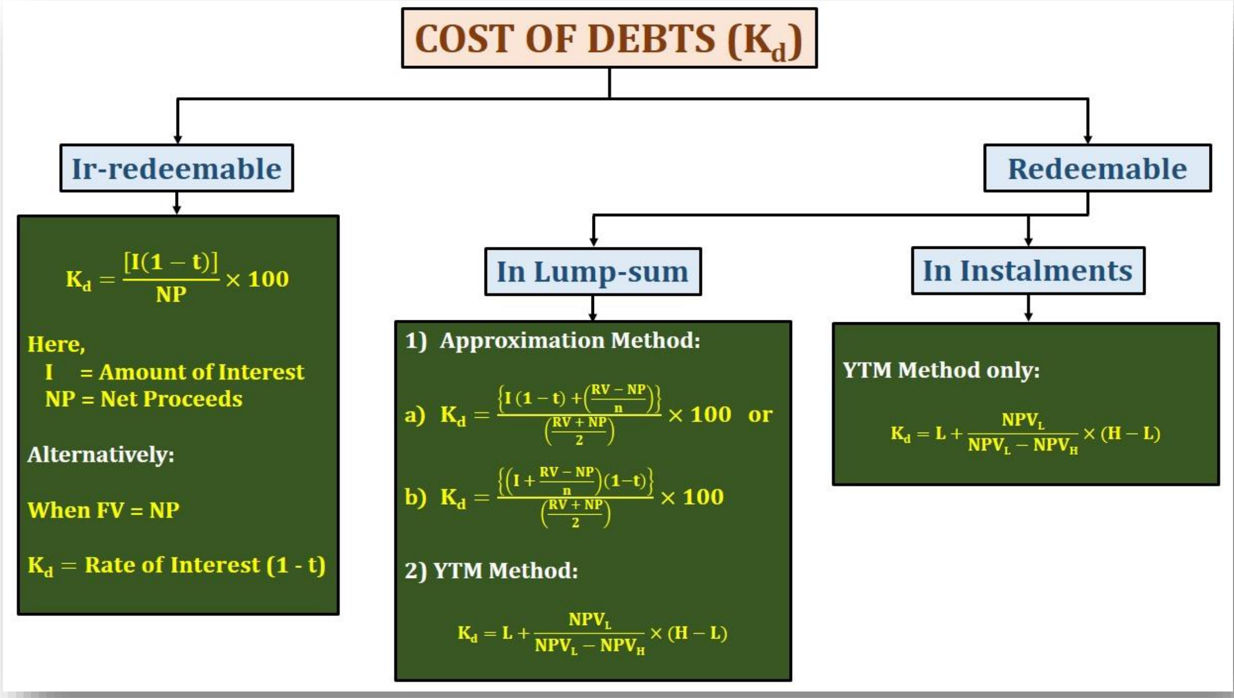
CHAPTER 8 COST OF CAPITAL

1. ***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. Cost of capital is also known as 'cut-off' rate, 'hurdle rate', 'minimum rate of return' etc.*

2. ***Components of Cost of Capital:***



3. ***Cost of Debt (K_d):***



(a) Cost of Irredeemable Debenture:

$$K_d = \frac{I\,(1-t)}{NP} \times 100$$

Where,

I = Amount of Interest
t = Tax rate
NP = Net Proceeds of Debenture or Current Market Price

Note: If Face Value of Debenture equal to Net Proceeds then

$$K_d = \text{Rate of Interest } (1-t)$$

(b) Cost of Redeemable Debenture (in Lump sum):

Approximation Method:

$$K_d = \frac{I\,(1-t) + \left(\frac{RV - NP}{n}\right)}{\frac{RV + NP}{2}} \times 100 \quad \text{Or} \quad = \frac{\left(I + \frac{RV - NP}{n}\right)(1-t)}{\frac{RV + NP}{2}} \times 100$$

Where,
I = Amount of Interest.
RV = Redemption value of Debenture
NP = Net Proceeds of Debenture or Current Market Price
n = Life of Debenture

Present Value Method (PV) / Yield to Maturity Method (YTM):

$$K_d = IRR = L + \frac{NPV_L}{NPV_L - NPV_H} \times (H - L)$$

(c) Cost of Redeemable Debenture (in Instalments):

$$K_d = IRR = L + \frac{NPV_L}{NPV_L - NPV_H} \times (H - L)$$

(d) Cost of Zero Coupon Bonds (ZCB):

$$K_d = \sqrt[n]{\frac{RV}{IP}} - 1$$

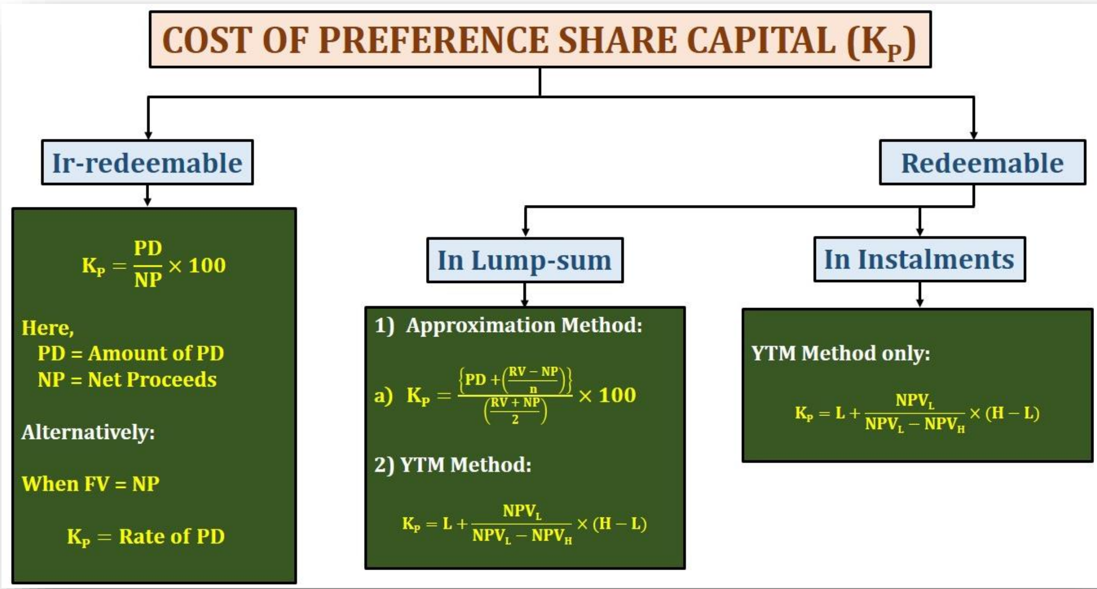
Where,
I = Amount of Interest.
RV = Redemption value of Debenture
IP = Issue Price of Bond
n = Life of Bond

Notes:

- In case of convertible debenture use convertible value in place of redemption value of debenture.
- If nothing is specified, issue price assumed to be equal to Market value or face value.
- If nothing is specified, redemption value assumed to be equal to face value.
- If nothing is specified, floatation cost assumed to be linked with "face value or issue price whichever is higher".

➢ *Price of debenture must be Ex-Interest price.*

4. *Cost of Preference Share Capital (K_P):*



(a) *Cost of Irredeemable Preference Share:*

$$K_p = \frac{PD}{NP} \times 100$$

Where,

PD	=	*Amount of Preference Dividend*
NP	=	*Net Proceeds of Preference Share or Current Market Price*

Note: *If Face Value of Preference Share equal to Net Proceeds then*

$$K_p = \text{Rate of Preference Dividend}$$

(b) *Cost of Redeemable Preference Share (in Lump sum):*

Approximation Method:

$$K_p = \frac{PD + \left(\frac{RV - NP}{n}\right)}{\frac{RV + NP}{2}} \times 100$$

Where,

PD	=	*Amount of Preference Dividend*
RV	=	*Redemption value of Preference Share*
NP	=	*Net Proceeds of Preference Share or Current Market Price*
n	=	*Life of Preference Share*

Present Value Method (PV) / Yield to Maturity Method (YTM):

$$K_p = IRR = L + \frac{NPV_L}{NPV_L - NPV_H} \times (H - L)$$

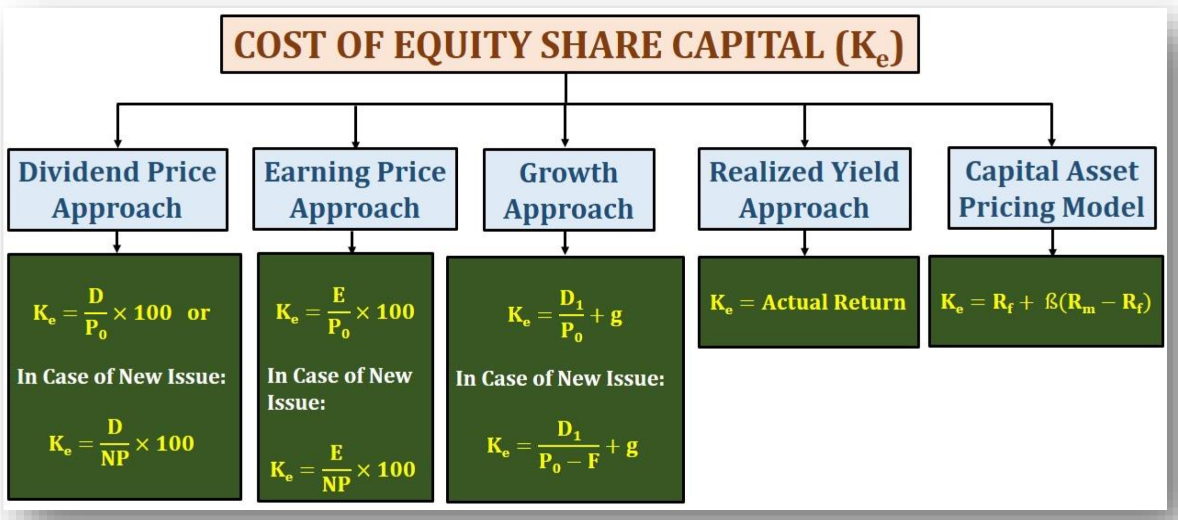
(c) *Cost of Redeemable Preference Share (in Instalments):*

$$K_d = IRR = L + \frac{NPV_L}{NPV_L - NPV_H} \times (H - L)$$

Note:

- *In case of convertible preference share use convertible value in place of redemption value.*
- *If nothing is specified, issue price assumed to be equal Market value or face value.*
- *If nothing is specified, redemption value assumed to be equal to face value.*
- *If nothing is specified, floatation cost assumed to be linked with "face value or issue price whichever is higher".*
- *Price of preference share must be Ex-Dividend price.*

5. Cost of Equity Share Capital (K_e):



(a) Dividend Price/Yield Approach:

$$K_e = \frac{D}{P_0} \times 100$$

Where,

D = *Expected/ Current Dividend*

P_0 = *Current Market Price of Equity Share*

Assumption: Constant Dividend

(b) Earning Price/Yield Approach:

$$K_e = \frac{E}{P_0} \times 100$$

Where,

E = *Expected/ Current EPS*

P_0 = *Current Market Price of Equity Share*

Assumption: Constant EPS

(c) Growth Approach or Gordon's Model:

$$K_e = \frac{D_1}{P_0} + g \quad \text{or} \quad \frac{D_0\,(1+g)}{P_0} + g$$

Where,

D_1 = $D_0\,(1 + g)$ = *Expected DPS*

P_0 = *Current Market Price of Equity Share*

g = *Constant Growth Rate of Dividend*

Note:

- In case of fresh issue of Equity shares (New Shares), Net Proceeds from equity share {(Issue price – Issue expenses/ Floatation cost) or (P_o - F)} is used in place of current price of share.

- If nothing is specified, floatation cost assumed to be linked with "face value or issue price whichever is higher".

- Price of equity share must be Ex-Dividend price.

- Estimation of Growth Rate:

(a) Average Method:

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

Where,

D_0 = Current Dividend
D_n = Dividend in n years ago

(b) Gordon's Growth Model:

$g = b \times r$

Where,

r = Rate of return on fund invested
b = Earning retention ratio

(d) Realised Yield Approach:

IRR Method:

K_e = IRR = $L + \frac{NPV_L}{NPV_L - NPV_H} \times (H - L)$

Geometric Mean Method:

$K_e = \sqrt[n]{(1 + Y1) \times (1 + Y2) \ldots\ldots (1 + Yn)} - 1$

Where,

n = Number of years

$(1+Y1) = \frac{D1+P1}{P0}$

Note: Geometric mean method can be used when MPS is given for each year.

(e) Capital Asset Pricing Model (CAPM):

$K_e = R_f + ß (R_m - R_f)$

Where,

R_f = Risk Free Rate of Return
R_m = Rate of Return on Market Portfolio
$R_m - R_f$ = Market Risk Premium
ß = Beta coefficient

6. **Cost of Retained Earnings (K_r):** After tax return to shareholder if he invest elsewhere.

Formulae:

K_r = K_e (of existing investors)

K_r = $K_e (1 - t_p)$ (In case of personal tax)

K_r = $K_e (1 - t_p) (1 - f)$ (f is rate of floatation cost)

7. **Weighted Average Cost of Capital (K_0):** WACC is also known as the overall cost of capital of having capitals from the different sources as explained above. WACC of a company depends on the capital structure of a company. 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. It can be calculated by using either Book Value weights or Market Value weights.

Proforma Statement of WACC

Capital Structure (a)	Amount (b)	Weight (c)	Specific Cost (d)	Cost of Capital (e) = c × d
Equity Share Capital	XXX	0.XXX	0.XX	0.XXX
Retained Earnings	XXX	0.XXX	0.XX	0.XXX
Preference Share Capital	XXX	0.XXX	0.XX	0.XXX
Debentures	XXX	0.XXX	0.XX	0.XXX
Total	XXX	1.000	WACC	0.XXX

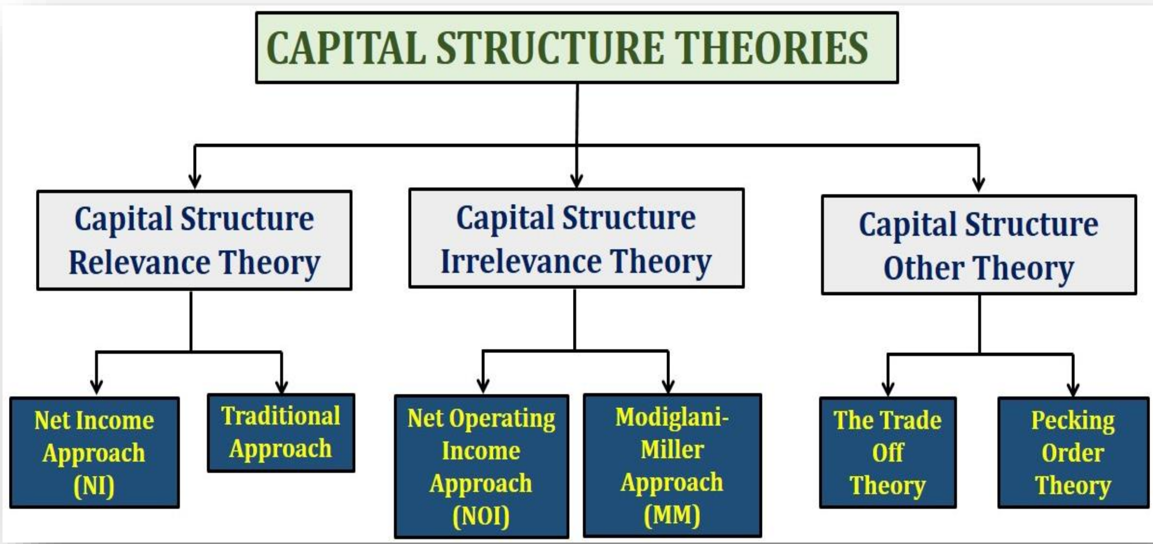
Note: Market Value of equity has been apportioned in the ratio of Book Value of equity and retained earnings when Market Value weights are used.

8. **Marginal Cost of Capital (MCC):** The marginal cost of capital may be defined as the cost of raising an additional rupee of capital. Marginal cost of capital is derived, when the average cost of capital is calculated using the marginal weights.

CHAPTER 9 CAPITAL STRUCTURE

1. **Capital Structure:** Capital structure is the combination of capitals from different sources of finance.

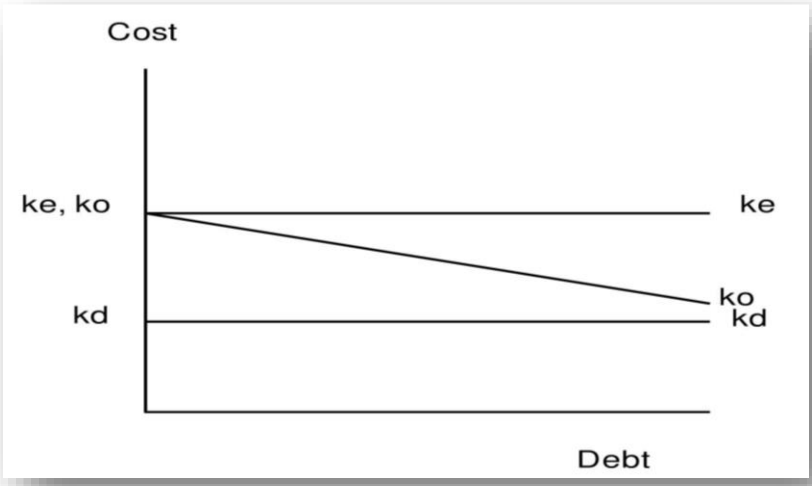
2. **Capital Structure Theories:**



3. **Net Income Approach (NI):** According to this approach, capital structure decisions are relevant to the value of the firm. An increase in financial leverage (Debt Proportion) 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.

As per NI Approach:

- K_d and K_e will remain constant.
- K_o will decrease with the help of use of Debt.
- MV of Equity and Firm will increase with the help of use of Debt.



Formulae:

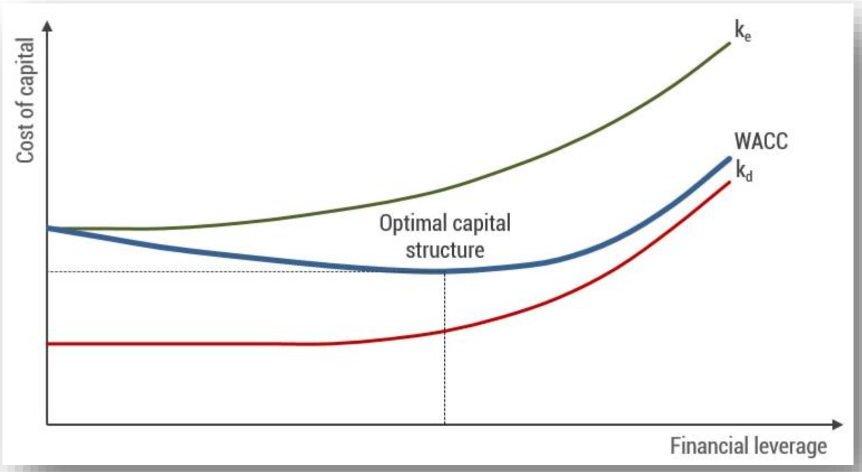
Value of Share (S)	=	$\frac{(EBIT - I)(1-t)}{K_e}$	Or	=	V - D
Value of Debt (D)	=	Face Value of Debt			
Value of Firm (V)	=	S + D	Or	=	$\frac{EBIT(1-t)}{K_o}$
Cost of Capital (K_o)	=	$\frac{EBIT(1-t)}{V} \times 100$	Or	=	$K_eW_e + K_dW_d$
Cost of Equity (K_e)	=	$\frac{(EBIT - I)(1-t)}{S} \times 100$			

Note: K_e and K_o of unlevered firm are same.

4. Traditional Approach: This approach favours 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 emerge.

As per Traditional Approach:

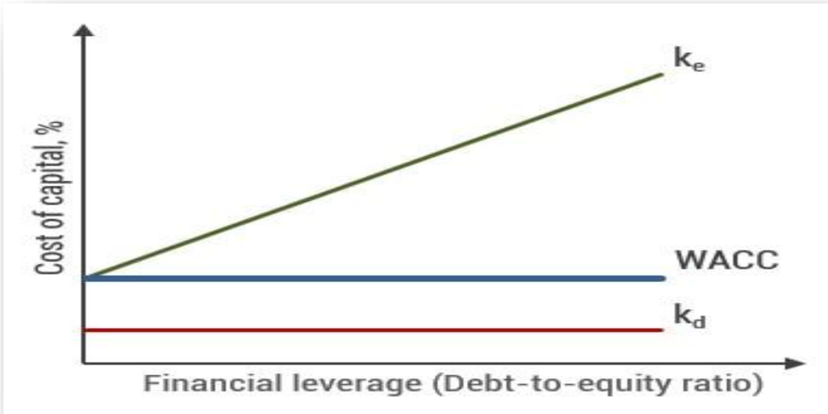
- K_d, K_e, K_o and MV of Equity and MV of Firm are variable
- Company has to select capital structure with lowest K_o or highest MV of Firm



5. Net Operating Income Approach (NOI): 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 per NOI Approach:

- K_d, K_o and MV of Firm will remain constant in case of without tax structure.
- K_d will remain constant in case of with tax structure, with the increase in Debt, MV of firm will increase and K_o will decrease.



Value of Firms as per NOI Approach:

Step 1: *Calculate Value of Unlevered Firm:* ***Value of Unlevered Firm (V_U)*** $= \frac{EBIT\,(1-t)}{K_o}$

Step 2: *Calculate Value of Levered Firm:* ***Value of Levered Firm (V_L)*** $= V_U + DT$

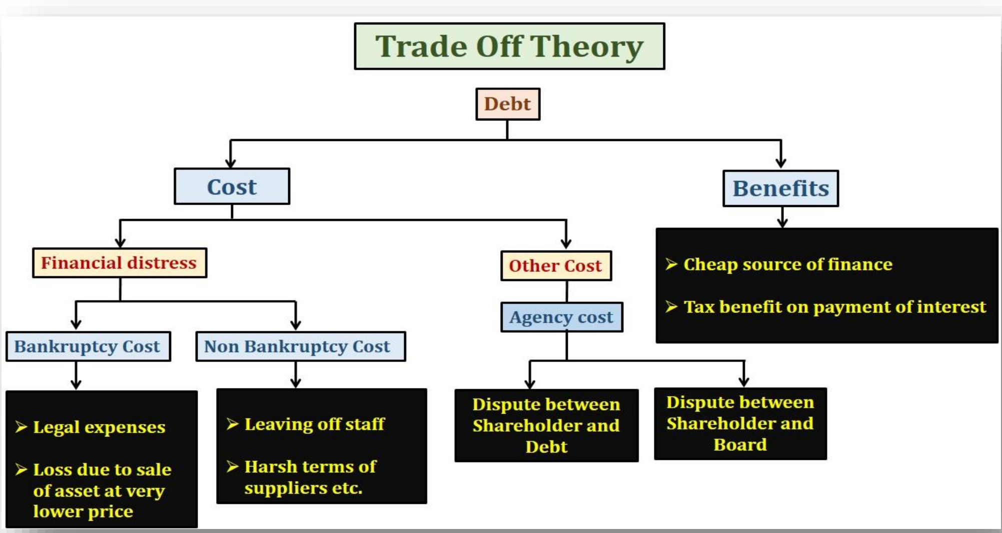
6. ***Modiglani-Miller Approach (MM):*** *The NOI approach is definitional or conceptual and lacks behavioral significance. However, Modigliani-Miller approach provides behavioral justification for constant overall cost of capital and therefore, total value of the firm.*

Assumptions of MM Approach:

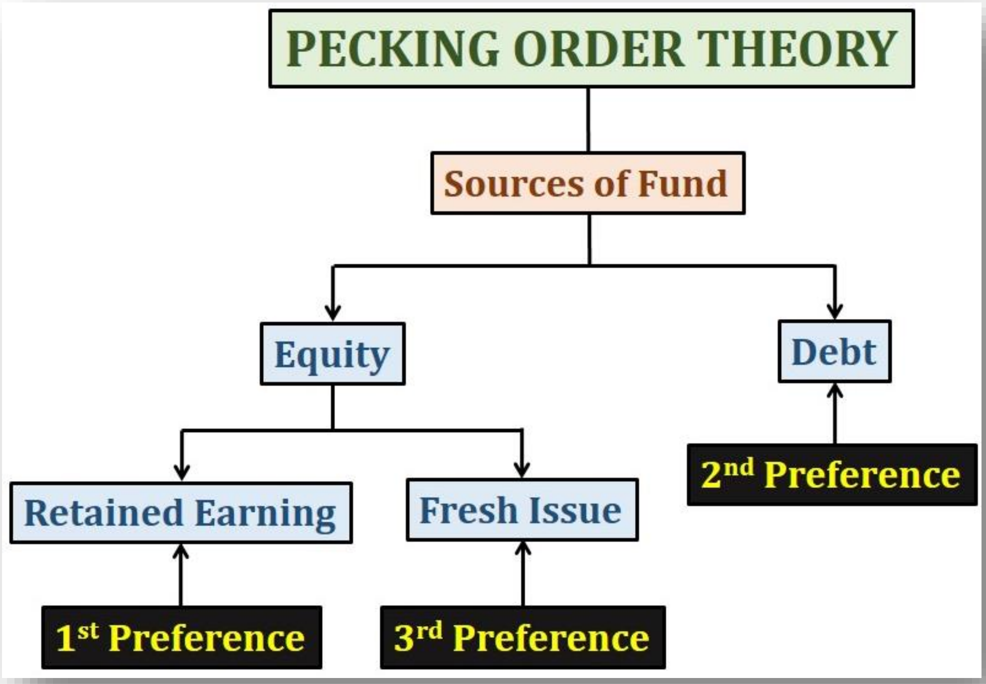
- *Capital markets are perfect*
- *All information is freely available*
- *There are no transaction costs*
- *All investors are rational*
- *Firms can be grouped into 'Equivalent risk classes'*
- *Non-existence of corporate taxes*

Note: *Solution of practical problems are same under NOI and MM Approaches*

7. ***The Trade Off Theory:***



8. Pecking Order Theory:



9. Arbitrage Process: *Capital structure arbitrage refers to a strategy used by companies and individual where they take advantage of the existing market mispricing across all securities to make profits. In this strategy, there is buying share of undervalued firms and sell shares of overvalued firm. The main objective is to make use of the pricing inefficiency to make a profit. There is anticipation that the pricing difference, will at some point cancel out or reach at equilibrium.*

***Situation 1:** When Levered firm is overvalued ($V_L > V_{UL}$):*

Step 1: Sell shares of levered firm
Step 2: Borrow in same Debt-Equity ratio
Step 3: Purchase same shareholding in unlevered firm to earn same return with lower investment

Or

Purchase shares of unlevered firm with full available funds to increase in income.

***Situation 1:** When Unlevered firm is overvalued ($V_{UL} > V_L$):*

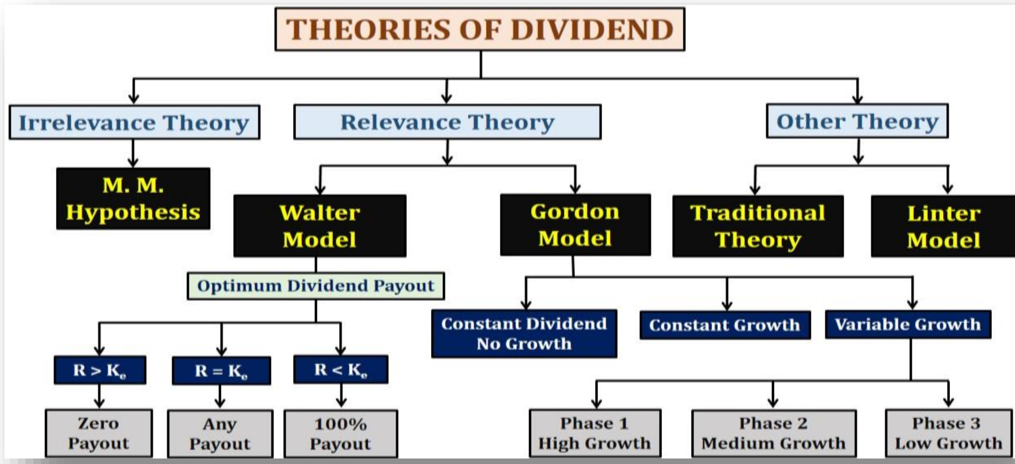
Step 1: Sell shares of unlevered firm
Step 2: Purchase same shareholding and debt in Debt-Equity ratio in levered firm to earn same return with lower investment

Or

Purchase shares and debt in Debt-Equity ratio of levered firm with full available funds to increase in income.

CHAPTER 10 DIVIDEND DICISIONS

1. Theories of Dividend:



2. Modigliani and Miller (MM) Hypothesis (1961):

MM approach is in support of the irrelevance of dividends i.e. firm's dividend policy has no effect on either the price of a firm's stock or its cost of capital.

Assumptions:

- Perfect capital markets
- No taxes or no tax discrimination
- Fixed investment policy
- No floatation or transaction cost
- Risk of uncertainty does not exist

Steps in Practical Problems:

Step 1: Calculate P_1:

$$P_0 = \frac{P_1 + D_1}{1 + K_e} \quad \text{or} \quad P_1 = P_0(1 + K_e) - D_1$$

Step 2: Calculate New Shares ($\triangle n$) required to be issued:

$$\triangle n = \frac{\text{Funds Required}}{P_1} = \frac{I - (E - D)}{P_1}$$

Step 3: Calculate Value of Firm (nP_0):

$$nP_0 = \frac{(n + \triangle n)\, P_1 - I + E}{1 + K_e}$$

3. Walter Model:

Walter approach is in support of the relevance of dividends i.e. firm's dividend policy has effect on either the price of a firm's stock or its cost of capital.

Assumptions:

- All investment proposals of the firm are to be financed through retained earnings only
- 'r' rate of return & 'K_e' cost of capital are constant
- Perfect capital markets
- No taxes or no tax discrimination between dividend income and capital appreciation (capital gain)
- No floatation or transaction cost
- The firm has perpetual life

Formula:

Market Price of Share (P) = $\frac{D + \frac{r}{K_e}(E - D)}{K_e}$

Where,

P	=	Market Price of the share
E	=	Earnings per share
D	=	Dividend per share
K_e	=	Cost of equity/ rate of capitalization/ discount rate
R	=	Internal rate of return/ return on investment

Company	'r' VS 'K_e'	Optimum Dividend Payout
Growth	$r > K_e$	Zero
Constant	$r = K_e$	Every payout ratio is optimum
Decline	$r < K_e$	100%

4. **Gordon's Model:** According to Gordon's model dividend is relevant and dividend policy of a company affects its value.

Assumptions:

- Firm is an all equity firm.
- IRR will remain constant.
- K_e will remains constant.
- Retention ratio (b) is constant i.e. constant dividend payout ratio will be followed
- Growth rate (g = br) is also constant.
- $K_e > g$
- All investment proposals of the firm are to be financed through retained earnings only.

Formulae of MPS {Gordon's Model or Dividend Discount Model (DDM)}:

Situation 1: Zero Growth or Constant Dividend:

$$P_0 = \frac{D}{K_e}$$

Situation 2: Constant Growth:

$$P_0 = \frac{D_1}{K_e - g} \quad \text{or} \quad = \frac{D_0\,(1+g)}{K_e - g}$$

$$g = b \text{ (earning retention ratio)} \times r \text{ (IRR or ROE)}$$

Situation 3: Variable Growth:

- **Phase 1:** Very High Growth
- **Phase 2:** High Growth
- **Phase 3:** Average Growth equal to industry

P_0 = Present Value of all future benefit from share

Note: Calculation of Intrinsic value of share and MPS of share are same

Company	'r' VS 'K_e'	Optimum Dividend Payout
Growth	$r > K_e$	Zero
Constant	$r = K_e$	Every payout ratio is optimum
Decline	$r < K_e$	100%

5. **The 'Bird-in-hand theory':** Myron Gordon revised his dividend model and considered the risk and uncertainty in his model. The Bird-in-hand theory of Gordon has two arguments:

- Investors are risk averse and
- Investors put a premium on certain return and discount on uncertain return.

Investors are rational, they want to avoid risk and uncertainty. They would prefer to pay a higher price for shares on which current dividends are paid. Conversely, they would discount the value of shares of a firm which postpones dividends. The discount rate would vary with the retention rate.

6. **Traditional Model:** According to the traditional position expounded by Graham & Dodd, the stock market places considerably more weight on dividends than on retained earnings. Their view is expressed quantitatively in the following valuation model:

$$P = m\left(D + \frac{E}{3}\right)$$

Where,

P = Market price per share, D = Dividend per share

E = Earnings per share, M = a multiplier

7. **John Linter's Model:** Linter's model has two parameters:

- The target payout ratio,
- The spread at which current dividends adjust to the target.

$$D_1 = D_o + [(EPS \times \text{Target payout}) - D_o] \times Af$$

Where,

D_1 = Dividend in year 1, D_o = Dividend in year 0 (last year dividend)

EPS = Earnings per share, Af = Adjustment factor or Speed of adjustment

8. **Stock Splits:** Stock split means splitting one share into many. Stock splits is a tool used by the companies to regulate the prices of shares i.e. if a share price increases beyond a limit, it may become less tradable, for e.g. suppose a company's share price increases from ₹50 to ₹1,000 over the years, it is possible that it might goes out of range of many investors.

Advantages:
- It makes the share affordable to small investors.
- Number of shares may increase the number of shareholders, hence the potential of investment may increase.

Limitations:
- Additional expenditure need to be incurred on the process of stock split.
- Low share price may attract speculators or short term investors, which are generally not preferred by any company.