By CA Ashish Kalra

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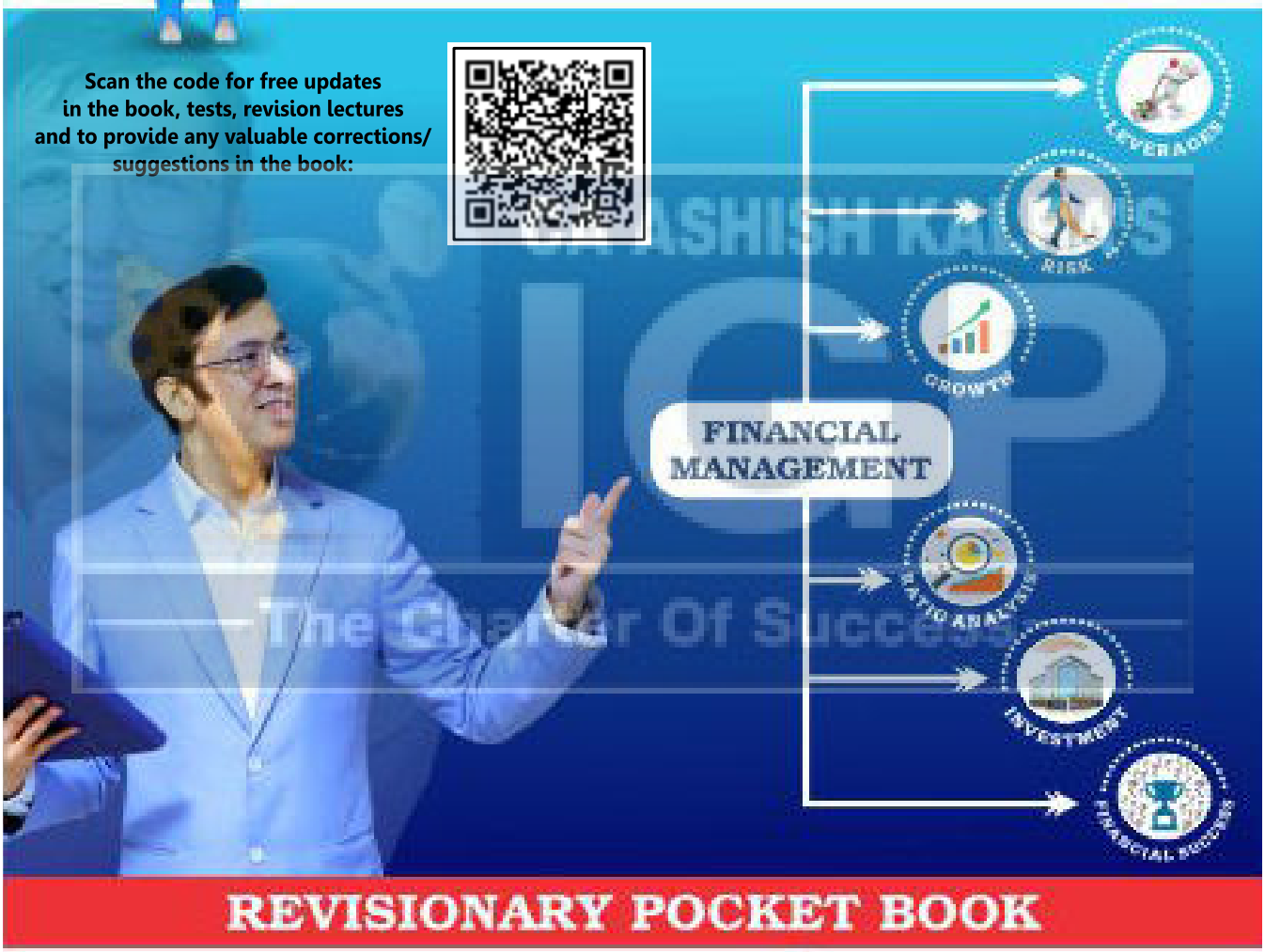

REVISIONARY POCKET BOOK

GAMES ARE INTERESTING & WE ENJOY PLAYING THEM. SIMILARLY, I WILL MAKE FM & ECO FOR FINANCE INTERESTING & JOYFUL FOR YOU AS A GAME. COME ENJOY SOLVING PROBLEMS WITH ME.

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TARGET 100/100

CA Ashish Kalra Sir

Master Of

CMA, FMSM & AFM

MENTOR & GURU OF

10 TIMES AIR-1

& **1000+** OTHER **RANK HOLDERS**

CA Ashish Kalra Sir

MENTOR & GURU OF

10 TIMES AIR-1

& 1000+ OTHER RANK HOLDERS

History Repeats Itself

Muskaan Vadhera
ROLL NO. 633648

CA-INTER.
CMA
–Marks–

(MAY-2022 RESULT)

100/100

Shubham Malhotra
ROLL NO. 814716

AIR 1

CA-INTER.
CMA
–Marks–

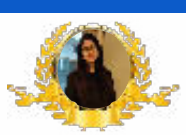
(NOV-2018 RESULT)

100/100

MITTUL GARG
CMA –MARKS– 99

SHIVAM MALHOTRA
CMA –MARKS– 99

AMRIT MITTAL
CMA –MARKS– 99



ISHITA
CMA –MARKS– 98

ANSHIKA GOEL
CMA –MARKS– 98

MAYANK GUPTA
CMA –MARKS– 98

PARI GUPTA
CMA –MARKS– 98

and many more...

& **1000+** OTHER **RANK HOLDERS**

CA|CS|CMA Results

10 Times AIR-1

SHUBHAM MALHOTRA
CA INTER/ NOV'18
AIR **1** | CMA Marks **100/100**

ETI AGARWAL
CA FINAL./ NOV'16
CS EXEC./ JUNE'15
CA IPC /NOV'13
3 TIMES AIR **1**

VIJENDER AGGARWAL
CA FINAL/NOV'14
CA IPC/NOV'10
2 TIMES AIR **1**

AKSHAY JAIN
CA IPC/NOV'13
AIR **1**

BHUMIKA AGARWALLA
CA IPC/NOV'12
AIR **1**

PRACHI JAIN
CA IPC/MAY'10
AIR **1**

SUBHANSHU GOEL
CS PROF./ DEC'15
AIR **1**

CMA & FMSM (CA-Inter.) Results Of
CA Ashish Kalra's Students

Muskaan Vadhera
CMA Marks **100/100**

Shubham Malhotra
AIR **1**
CMA Marks **100/100**
FMSM Marks **87/100**

MITTUL GARG	SHIVAM MALHOTRA	AMRIT MITTAL	ISHITA	ANSHIKA GOEL	MAYANK GUPTA	PARI GUPTA	ASHISTA JAIN
CMA 99	CMA 99	CMA 99	CMA 98	CMA 98	CMA 98	CMA 98	CMA 97

YANIT GROVER	KUNAL	ANMOL GOYAL	RAHUL ARORA	VANSHIT AGGARWAL	MAYANK KHANDELWAL	ATUL ROHILLA	DUSHYANT GARG
CMA 97	CMA 97	CMA 97	CMA 97	CMA 97	CMA 97	CMA 97	CMA 97

CHAITANYA LUTHRA	ANKIT BANSAL	ANKIT LAKHOTIA	VIHAL BANSAL	SARTHAK GUPTA	RAUNAK AGARWAL	DEBENDRA SURANA	PRITY RANI
FMSM 96	FMSM 96	FMSM 96	FMSM 96	FMSM 95	FMSM 95	FMSM 95	FMSM 95

SAHIL ARORA	SUMIL SETHI	KARTIK SEHGAL	SHIVAM CHHABRA	PRAGATI VARSHNEY	VAISHALI GUPTA	BHUMIKA AGARWALLA	HARSHITA GUPTA
FMSM 95	FMSM 95	FMSM 94	FMSM 94	FMSM 94	FMSM 94	FMSM 94	FMSM 94

and many more...

focused on concepts which really helped me in my revisions. His books are more than sufficient for exams and I did not have to refer any other study material. His pocket books were really very helpful as they are very unique which helped me in recalling the concepts. He always used to focus on making us understand the logics behind the formulas, rather than cramming them.

CMA Marks 100/100

FM-ECO Marks 87/100

CMA Marks 100/100

Scored 100/100 in CMA and couldn't have achieved it without Ashish sir. I used to keep contacting him regarding my doubts and at times when I was tensed. He used to be always there for me to guide and support me. He suggested me a proper study pattern and timetable and on top of that the motivation he provided, it worked as a booster. I didnt study apart from the material that he provided as nothing comes beyond that. Dont even think once before choosing him as your mentor. I can assure that this will be your best decision.

10 TIMES AIR 1 | **1000+ OTHER RANK HOLDERS IN LAST 25+ YEARS**

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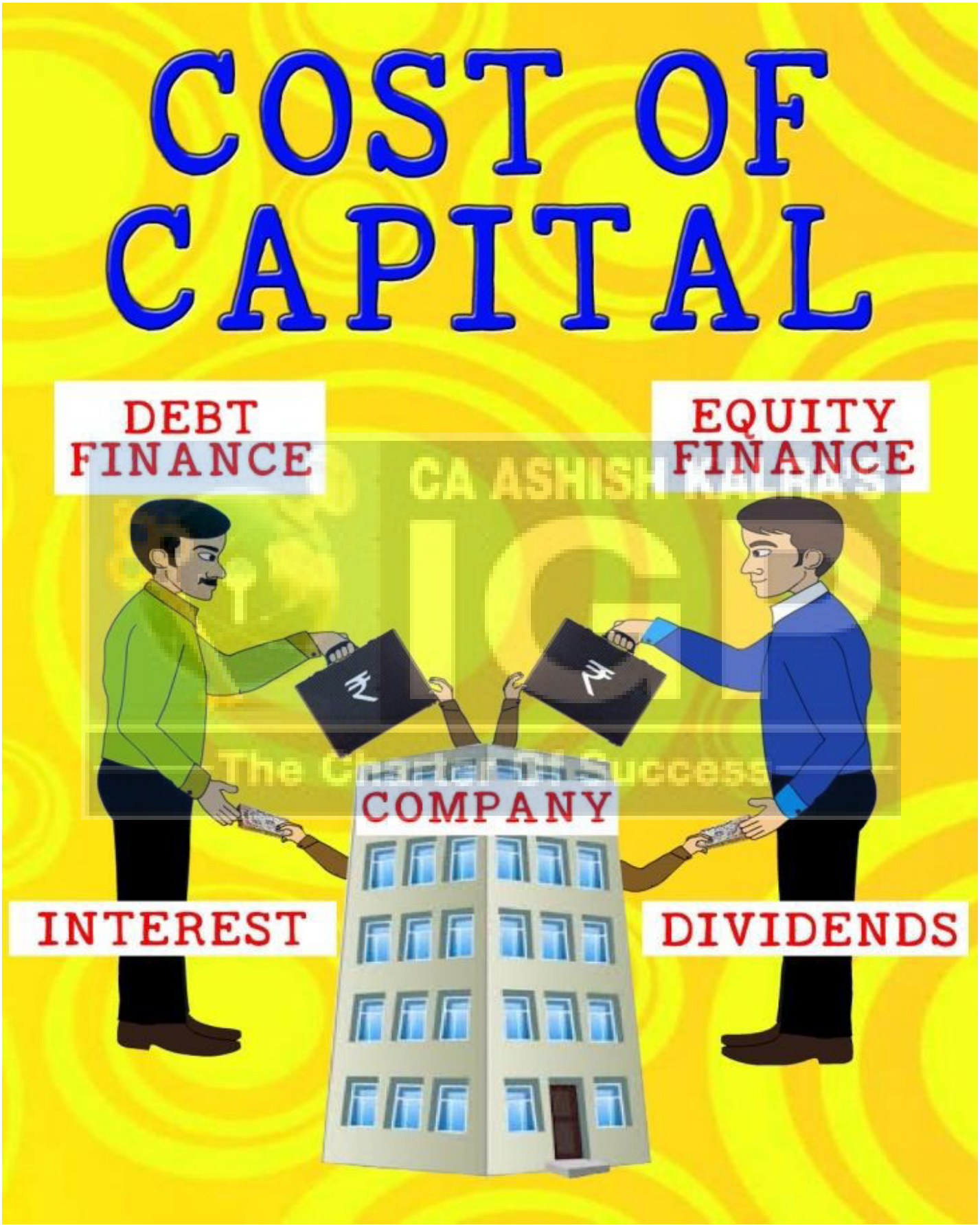
COST OF CAPITAL



COST OF DEBT (Kd)

(A) Cost of Irredeemable/Perpetual Debt:

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

Where, I = Amount of Annual Interest

t = Corporate Income Tax Rate

NP = Net Proceeds

(B) Cost of Redeemable Debt:

$$Kd = \frac{I\,(1 - t) + \frac{(RV - NP)}{n}}{\frac{NP + RV}{2}}$$

Where, RV = Redeemable Value

n = Numbers of years to maturity

COST OF DEBT USING PRESENT VALUE METHOD [YIELD TO MATURITY (YTM) APPROACH]

The cost of redeemable debt (K_d) is also calculated by discounting the relevant cash flows using internal rate of return (IRR). (The concept of IRR is discussed in the Chapter "CAPITAL BUDGETING"). Here, YTM is the annual return of an investment from the current date till maturity date. So, **YTM** is the IRR at which **PV of CASH INFLOWS equates with** the **PV of CASH OUTFLOWS**.

The relevant cash flows are as follows:

Year	Cash Flows
	CASH INFLOWS:
0	Next proceeds in case of new issue/ Current market price in case of existing debt (NP or P_0)
	CASH OUTFLOWS:
1 to n	Interest amount net of tax [I(1-t)]
n	Redemption value (RV)

COST OF PREFERENCE SHARES (Kp)

(A) Cost of Irredeemable/Perpetual Preference Shares:

$$K_p = \frac{D}{NP}$$

Where, D = Amount of Annual Preference Dividends

(B) Cost of Redeemable Preference Shares:

$$K_p = \frac{D + \frac{(RV - NP)}{n}}{\frac{NP + RV}{2}}$$

COST OF PREFERENCE SHARE CAPITAL USING PRESENT VALUE METHOD [YIELD TO MATURITY (YTM) APPROACH]

The cost of redeemable preference shares (K_p) is also calculated by discounting the relevant cash flows using internal rate of return (IRR). Here, YTM is the annual return of an investment from the current date till maturity date. So, **YTM** is the IRR at which **PV of CASH INFLOWS equates with** the **PV of CASH OUTFLOWS**.

The relevant cash flows are as follows:

Year	Cash Flows
	CASH INFLOWS:
0	Next proceeds in case of new issue/ Current market price in case of existing debt (NP or P_0)
	CASH OUTFLOWS:
1 to n	Annual Preference dividends
n	Redemption value (RV)

COST OF EQUITY (Ke)

1. Dividend Yield Model/Dividend Price Model:

$$Ke = \frac{DPS}{NP/MPS}$$

Where, DPS = Amount of Equity Dividends per Share

MPS = Market Price per Equity Share

2. Earnings Yield Model/Earning Price Model:

$$Ke = \frac{EPS}{NP/MPS}$$

Where, EPS = Earnings per Equity Share

3. Dividend Price Ratio plus Growth Method/ Dividend Growth Model:

$$Ke = \frac{D_1}{NP/P_0} + g$$

Where, D_1 = Next Expected Dividends

$= D_0 (1 + g)$

OR $= E (1 - b)$

$g = b \times r$

D_0 = Dividends just paid/Dividends paid at the beginning of the year

E = Expected Earnings for Current Year

b = Retention ratio or 100 – Dividends Payout Ratio

P_0 = Market Price of Equity Shares at beginning of year

g = Growth Rate of the Company

r = Return on Equity

4. Realised Yield Approach:

Ke (Realised Yield for 1 year) = $\frac{D_1 + P_1 - P_0}{P_0}$

Where, P_1 = Market price at the end of year 1

Ke (Realised Yield for a number of years) = Discount Rate at which amount invested in the shares by the shareholders equals to the Present Value of Inflows received by the investors (i.e. dividends & the actual MPS at the time of sale).

5. Capital Asset Pricing Model (CAPM):

Ke = Rf + β [ER(m) – Rf]

Rf = Risk free Rate of Interest

β = Beta Coefficient or Market Sensitivity

ER(m) = Expected Return of Market

ER(m) – Rf = Market Risk Premium

Calculation of Beta of a Security:

$\beta = \frac{\sigma \text{ security} \times \text{Correlation security \& market}}{\sigma \text{ Market}}$

COST OF RETAINED EARNINGS (Kre)

Use **same model for** computing **Kre** as **used** for computing **Ke**. Note that while computing Kre, only **MPS** shall be taken as a **denominator**.

Adjustment for Personal Income-Tax, Brokerage, Commission etc. in computation of Kre:

Kre = Ke (1 - tp) (1 - B)

Where, Ke = Required Return of Equity Shareholders

tp = Personal Tax of Shareholders

B = Brokerage Rate

WEIGHTED AVERAGE COST OF CAPITAL (WACC) OR OVERALL COST OF CAPITAL (Ko)

Ko = (Kd x Wd) + (Kp x Wp) + (Ke x We) + (Kre x Wre)

Note: Book Value or Market Value Weights may be used, however Market Value Weights are preferred.

SCHEDULE OF MARGINAL COST OF CAPITAL

Step I: Determine Pattern of raising marginal funds.

Step II: Compute Cost of Capital of each segment of all Sources of Finance.

Step III: Determine Breaking Points (or point of exhaustion of cheaper segment of source of finance)

$$\text{Breaking Point} = \frac{\text{Amount of Cheaper Segment of a Source of Finance}}{\text{Weight of Source of Finance}}$$

Step IV: Determine Average Cost of Capital at each Breaking Point.

Step V: Determine Overall WACC of entire Marginal Funds.

CURRENT YIELD

$$\text{Current Yield} = \frac{\text{Next Annual Interest Income}}{\text{Current Price or Value of Bond/Debenture}} \times 100$$

INTRINSIC VALUE OF A BOND/ DEBENTURE

(A) Intrinsic Value of Irredeemable Bond/Debenture:

$$\text{Intrinsic Value} = \frac{\text{Amount of Annual Interest Income}}{\text{Required Rate of Return}}$$

(B) Intrinsic Value of Redeemable Bond/Debenture:

$$\text{Intrinsic Value} = \text{PV of Future Interest} + \text{PV of Redeemable Value}$$

INTRINSIC VALUE OF PREFERENCE SHARES

(A) Intrinsic Value of Perpetual/Irredeemable Preference Shares:

$$\text{Intrinsic Value} = \frac{\text{Annual Preference Dividend Receivable in perpetuity}}{\text{Required Rate of Return}}$$

(B) Intrinsic Value of Redeemable Preference Shares:

$$\text{Intrinsic Value} = \text{P.V of Preference Dividends Receivable till Maturity} + \text{Present Value of Maturity Value}$$

INTRINSIC VALUE OF EQUITY SHARES

(A) Constant Dividends receivable annually in perpetuity:

$$\text{Intrinsic Value/Po} = \frac{DPS}{Ke}$$

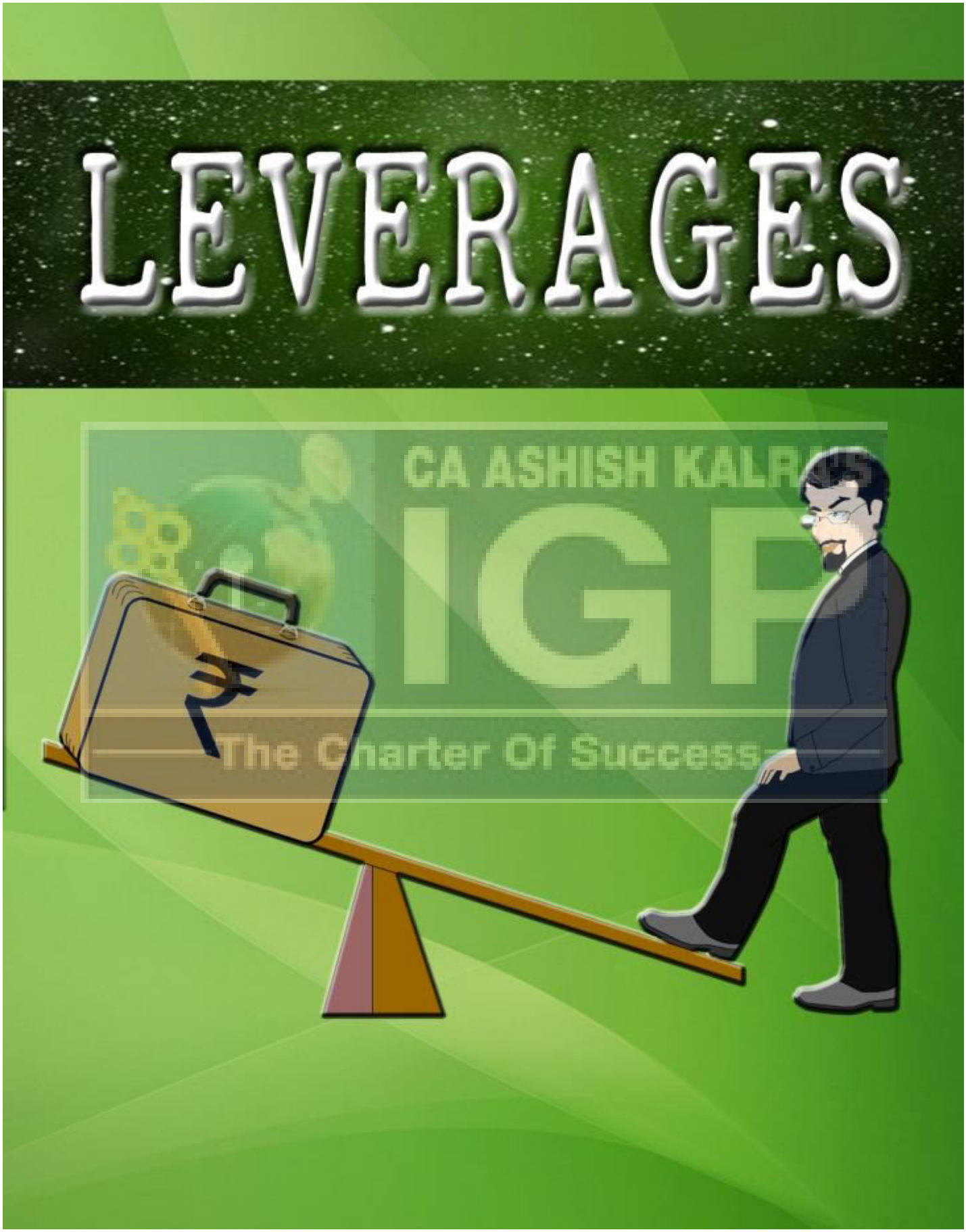
(B) Dividends growing annually at a perpetual growth rate:

$$\text{Intrinsic Value/Po} = \frac{D_1}{Ke - g}$$

(C) Dividends growing abnormally for some years & then normalising growth in perpetuity:

Intrinsic Value/Po = P.V. of Dividends receivable during Abnormal Growth Period + P.V. of Intrinsic Value of Shares at the end of Abnormal Growth Period

LEVERAGES



LEVERAGES

Type of Risk	Type of Leverage used to measure risk
Operating/Business	DOL
Financial	DFL
Combined/Total	DCL or DTL

CHART SHOWING DOL, DFL & DCL

Income Statement

Sales	xxx	DOL	DCL
Less: Variable Cost	(xxx)		
Contribution	xxx		
Less: Fixed Cost	(xxx)		
EBIT	xxx	DFL	
Less: Interest	(xxx)		
EBT	xxx		
Less: Income tax	(xxx)		
EAT	xxx		
Less: Preference dividend	(xxx)		
EAE	xxx		
No. of equity shares	xxx		
EPS	xxx		

DEGREE OF OPERATING LEVERAGE (DOL)

$$DOL = \frac{\text{Contribution}}{\text{EBIT}} = \frac{\% \Delta \text{ EBIT}}{\% \Delta \text{ Sales}}$$

DEGREE OF FINANCIAL LEVERAGE (DFL)

$$DFL = \frac{\text{EBIT}}{\text{EBT} - \frac{\text{Pref. Div}}{(1-t)}} = \frac{\% \Delta \text{ EPS}}{\% \Delta \text{ EBIT}}$$

DEGREE OF COMBINED LEVERAGE (DCL)/ TOTAL LEVERAGE

$$DCL = [DOL \times DFL] = \frac{\text{Contribution}}{\text{EBT} - \frac{\text{Pref. Div}}{(1-t)}} = \frac{\% \Delta \text{ EPS}}{\% \Delta \text{ Sales}}$$

RELATIONSHIP BETWEEN BEP & LEVERAGES

Operating BEP & DOL	
Sales	**DOL**
• When sales is much higher then operating BEP	• DOL will be slightly more than 1
• With the decrease in sales	• DOL will increase
• At operating BEP Sales	• DOL will be infinite
• When sales is slightly less than operating BEP	• DOL will be highly negative
• Further reduction in sales	• DOL will became lower negative & move towards 0
• At 0 Sales	• DOL will be 0

Financial BEP & DFL	
EBIT	**DFL**
• When EBIT is much higher than financial BEP	• DFL will be slightly more than 1
• With the decrease in EBIT	• DFL will increase
• At financial BEP	• DFL will be infinite
• When EBIT is slightly less than financial BEP	• DFL will be highly negative
• Further reduction in EBIT	• DFL will become lower negative & move towards 0
• At 0 EBIT	• DFL will be 0

TRADING ON EQUITY: IMPACT OF RAISING LONG TERM DEBT FUNDS

Case	Financial Leverage Position	Desired level of D/E to maximise ROE
• ROCE > Interest Rate	Favourable	High level
• ROCE < Interest Rate	Unfavourable	Nil or Low level
• ROCE = Interest Rate	Neutral	Any Level

TRADING ON EQUITY: IMPACT OF RAISING PREFERENCE SHARE CAPITAL

Case	Position	Desired level of preference/ Equity to maximise ROE
• Past tax ROCE > Preference dividend rate	Favourable	High level
• Post tax ROCE > Preference Dividend Rate	Unfavourable	Nil or Low level
• Post tax ROCE = Preference dividend rate	Neutral	Any Level

MARGIN OF SAFETY (MOS)

MOS (value) = Actual Sales value – Operating BEP Sales Value

MOS (volume) = Actual Sales volume - Operating BEP sales volume

$$\text{MOS ratio} = \frac{\text{Actual sales - BEP sales}}{\text{Actual Sales}} \times 100$$

$$\text{Or} = \frac{\text{Actual sales – BEP Sales}}{\text{Actual sales}} \times \frac{\text{P/V ratio}}{\text{P/V ratio}}$$

$$\text{Or} = \frac{\text{Contribution – Fixed cost}}{\text{Contribution}}$$

$$\text{Or} = \frac{\text{EBIT}}{\text{Contribution}}$$

$$\text{Or} = \frac{1}{\text{DOL}}$$

$$\text{Hence, DOL} = \frac{1}{\text{MOS ratio}}$$

ANALYSIS OF DCL

Case	DOL	DFL	Total Risk	Remarks
I	Low	Low	Low	Cannot take advantage of Trading on Equity.
II	High	High	Very High	Very risky combination
III	High	Low	Moderate	Low EBIT due to high DOL & Lesser advantage of Trading on equity due to low DFL.
IV	Low	High	Moderate	Best combination as maximum benefit of trading on equity is taken with moderate total risk.

IMPACT OF FINANCIAL LEVERAGE ON SHAREHOLDERS' WEALTH

(I) Using ROI-ROE Analysis Framework:

$$ROI = \frac{EBIT}{\text{Capital Employed}} \times 100$$

$$ROE = ROI\,(1 - t) + \frac{D}{E}(ROI - I)(1 - t) + \{ROI(1 - t) - PD\}\frac{P}{E}$$

Where, ROI = Return on Investment

EBIT = Earnings before Interest & Tax or Net Operating Profits

Capital Employed = Long term Debt + Shareholders' funds

ROE = Return on Equity

D = Debt amount in capital structure

E = Equity Shareholders' Funds in capital structure

I = Interest Rate

t = Corporate Income Tax Rate

PD = Preference Dividends Rate

P = Preference Share Capital

(II) Using ROA-ROE Analysis Framework:

$$ROA = \frac{NOPAT}{\text{Operating Assets}} \times 100$$

$$ROE = ROA + \frac{D}{E}(ROA - Kd)$$

Where, NOPAT = EBIT (1 - t)

Operating Assets = Total Assets invested in the business

Kd = Interest rate (1 - t)

FINANCIAL BEP

$$\text{Financial BEP} = \text{Interest amount on Long term Debts} + \frac{\text{Preference Dividends}}{1 - \text{Income Tax Rate}}$$

OPERATING BEP

$$\text{Operating BEP (in units)} = \frac{\text{Operating Fixed Costs}}{\text{Contribution per unit}}$$

$$\text{Operating BEP (in ₹)} = \frac{\text{Operating Fixed Costs}}{\text{P/V Ratio}}$$

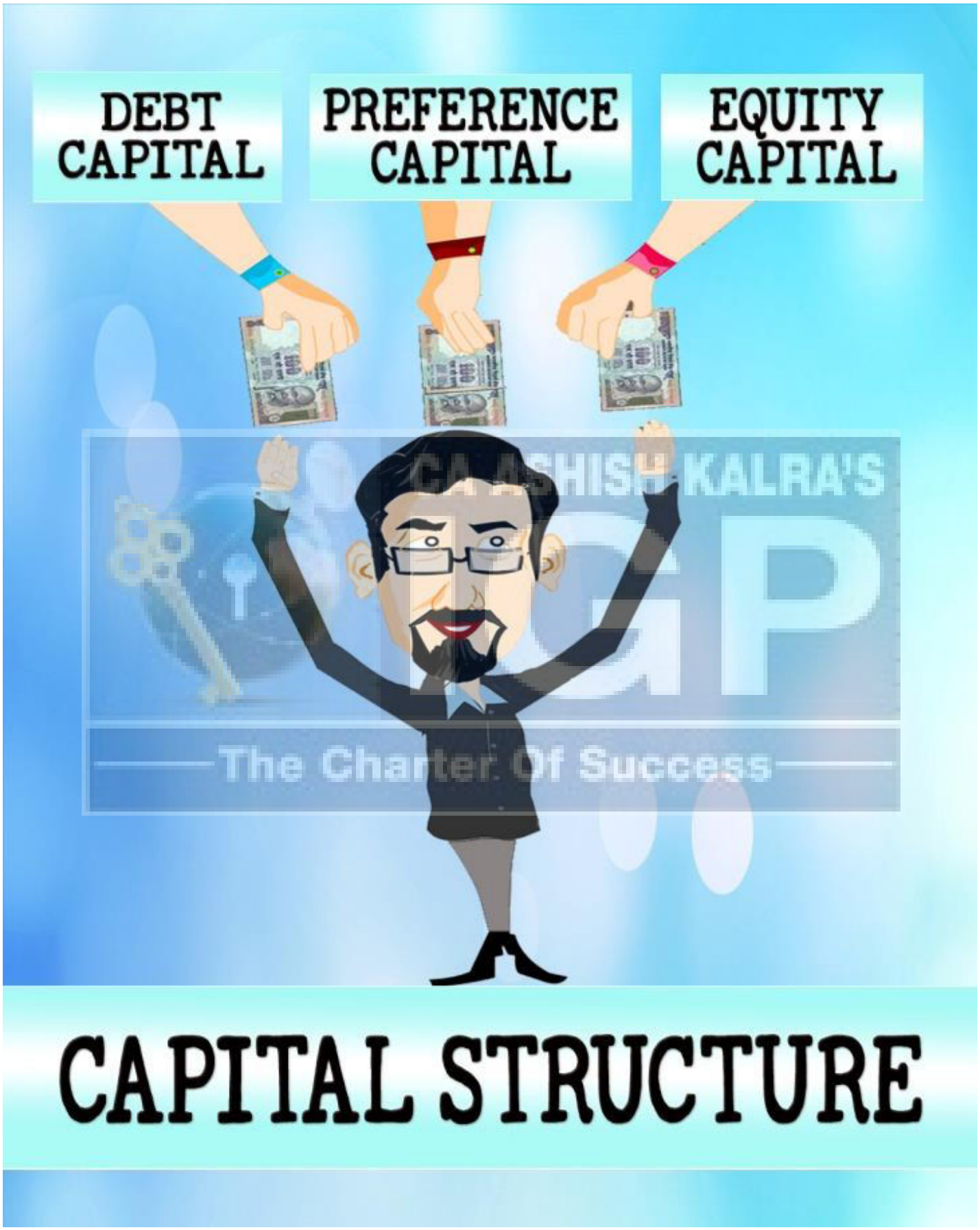
$$\text{Where, P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

OVERALL BEP

$$\text{Overall BEP (in units)} = \frac{\text{Operating Fixed Costs} + \text{Financial Fixed Costs}}{\text{Contribution per unit}}$$

$$\text{Overall BEP (in ₹)} = \frac{\text{Operating Fixed Costs} + \text{Financial Fixed Costs}}{\text{P/V Ratio}}$$

$$\text{Where, Financial Fixed Costs} = \text{Interest on Long term Debts} + \frac{\text{Preference Dividends}}{1 - \text{Income Tax Rate}}$$


DEBT CAPITAL
PREFERENCE CAPITAL
EQUITY CAPITAL
CA ASHISH KALRA'S
IGP
The Charter Of Success
CAPITAL STRUCTURE

OPTIMAL CAPITAL STRUCTURE

Optimum capital structure is one where **MPS is the maximum**, if there is a **tie in highest MPS**, choose capital structure having **highest EPS**.

$$\text{Expected EPS} = \frac{(\text{Expected EBIT} - I)(1 - t) - PD}{N}$$

Expected MPS = Expected EPS x P/E ratio

INDIFFERENCE POINT

$$\frac{(x - I)(1 - t) - PD}{N_1} = \frac{(x - I)(1 - t)}{N_2}$$

Where, x = Indifference Point EBIT

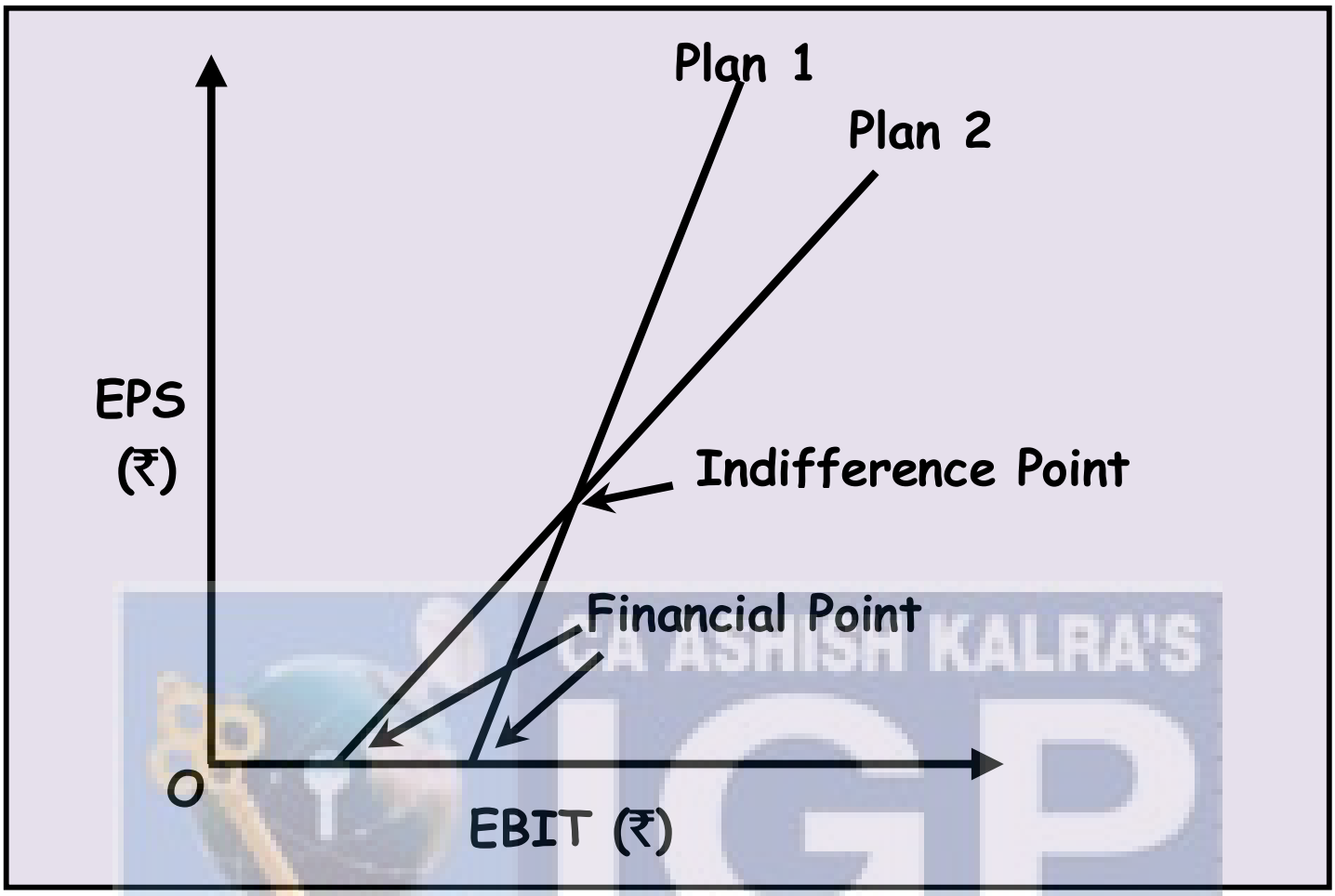
I = Interest amount on Long term Debts

t = Income Tax Rate

N_1 = No. of Equity Shares in Alternative -1

N_2 = No. of Equity Shares in Alternative -2

PD = Preference Dividends amount



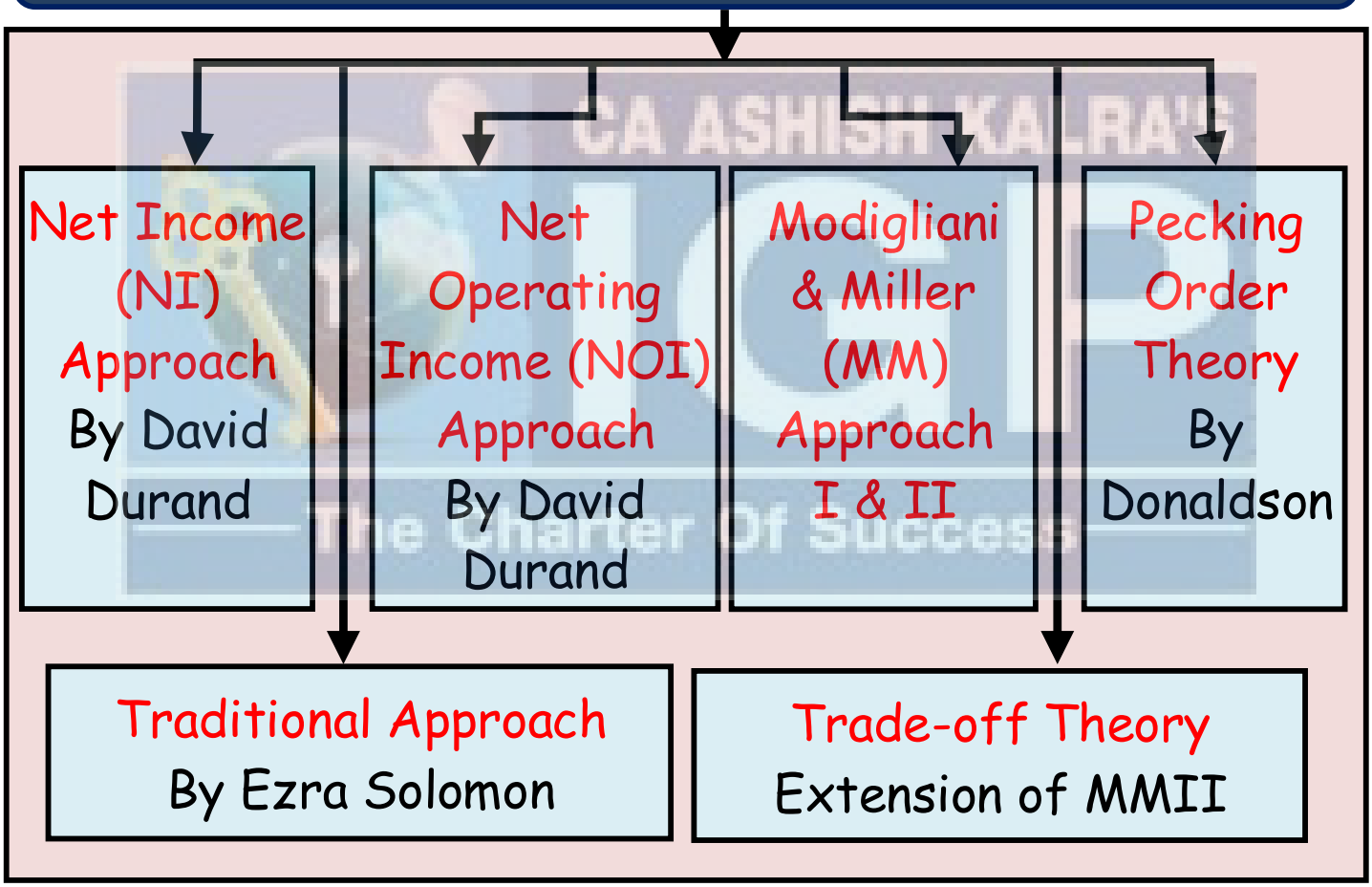
Expected EBIT	Better Plan
< Indifference Point	Lower Financial Break Even Point
= Indifference Point	Any one of the two plans
> Indifference Point	Lesser number of Equity Shares

FINANCIAL BREAK - EVEN POINT

Financial Break Even Point Level of EBIT

= Interest on long term debts + $\frac{\text{Preference dividends}}{(1 - t)}$

THEORIES OF CAPITAL STRUCTURE



COMMON EQUATIONS FOR THEORIES

$$V_F = V_D + V_E = \frac{I}{Kd} + \frac{EBIT - I}{Ke}$$

OR $$V_F = \frac{EBIT}{Ko}$$

Where, V_F = Value of Firm

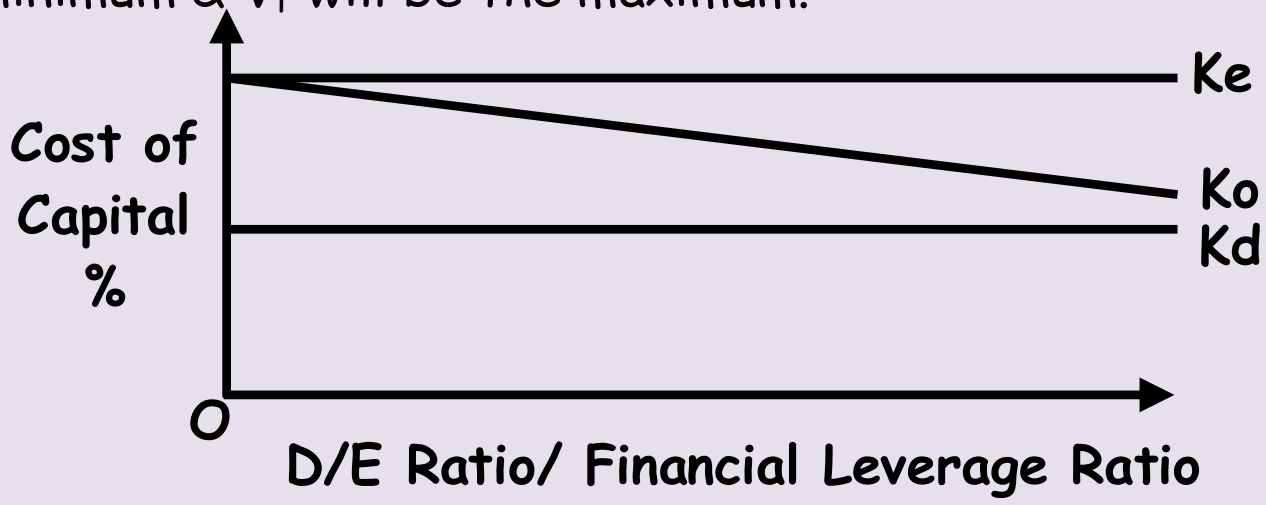
V_D = Value of Debt

V_E = Value of Equity

I = Amount of Interest

NET INCOME (NI) APPROACH

There is a relationship between capital structure & V_F. The higher the debt-equity ratio/leverage, the better it is. At the highest possible leverage, Ko will be the minimum & V_F will be the maximum.



$$K_{eu} = K_{eL}$$

$$V_u = V_{Eu} = \frac{EAE}{K_{eu}} = \frac{EBIT}{K_{eu}}$$

Where, EAE = Earnings Available for Equity Shareholders

V_u = Value of Unlevered Firm

V_{Eu} = Value of Equity of Unlevered Firm

K_{eu} = Required Rate of Return to Equity Shareholders of Unlevered Firm

K_{ou} = Overall cost of capital of unlevered firm

$$V_L = V_D + V_{EL}$$

$$V_{EL} = \frac{EAE}{K_{eL}} = \frac{(EBIT - I)}{K_{eL}}$$

$$K_{OL} = \frac{EBIT}{V_L}$$

Where, V_L = Value of Levered Firm

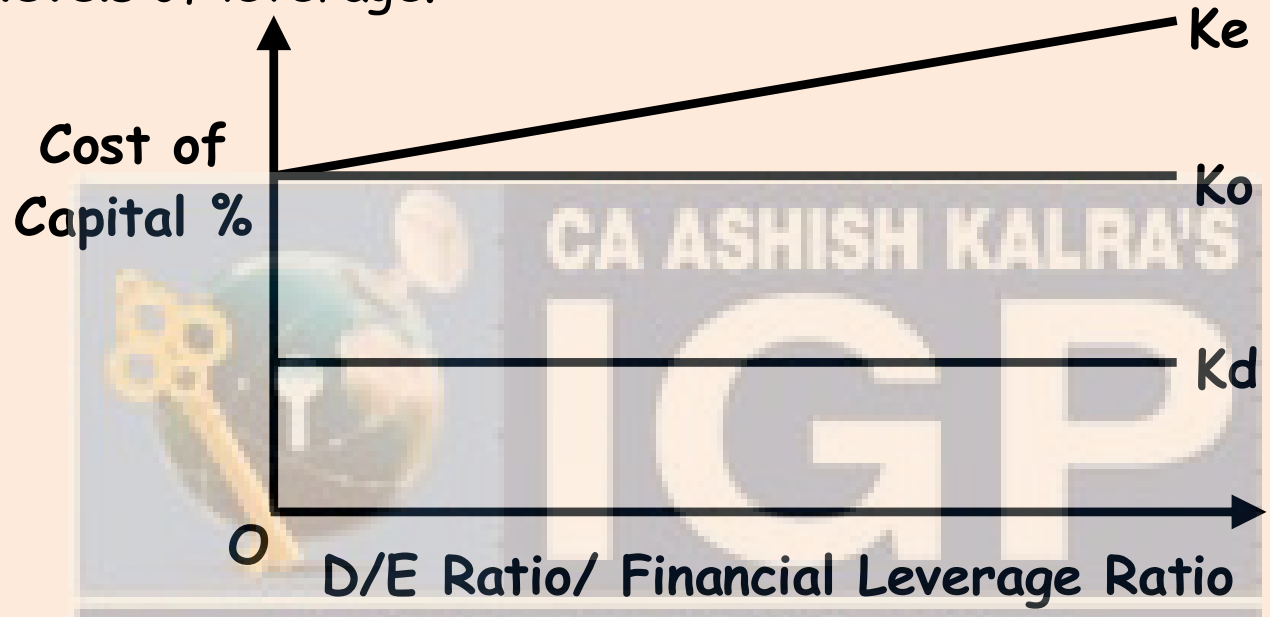
K_{OL} = Overall Cost of Capital of Levered Firm

V_{EL} = Value of Equity of Levered Firm

K_{eL} = Required Rate of Return of Equity Shareholders of Levered Firm

NET OPERATING INCOME (NOI) APPROACH

There is **no relationship** between **Capital Structure** & **V_F**. **All** capital **structures** are **optimal**. Since, Ko & EBIT are constant, hence **V_F** also remains **constant** at **all levels** of leverage.



$$V_L = Vu = \frac{EBIT}{Ko}$$

$$Ko_L = Kou$$

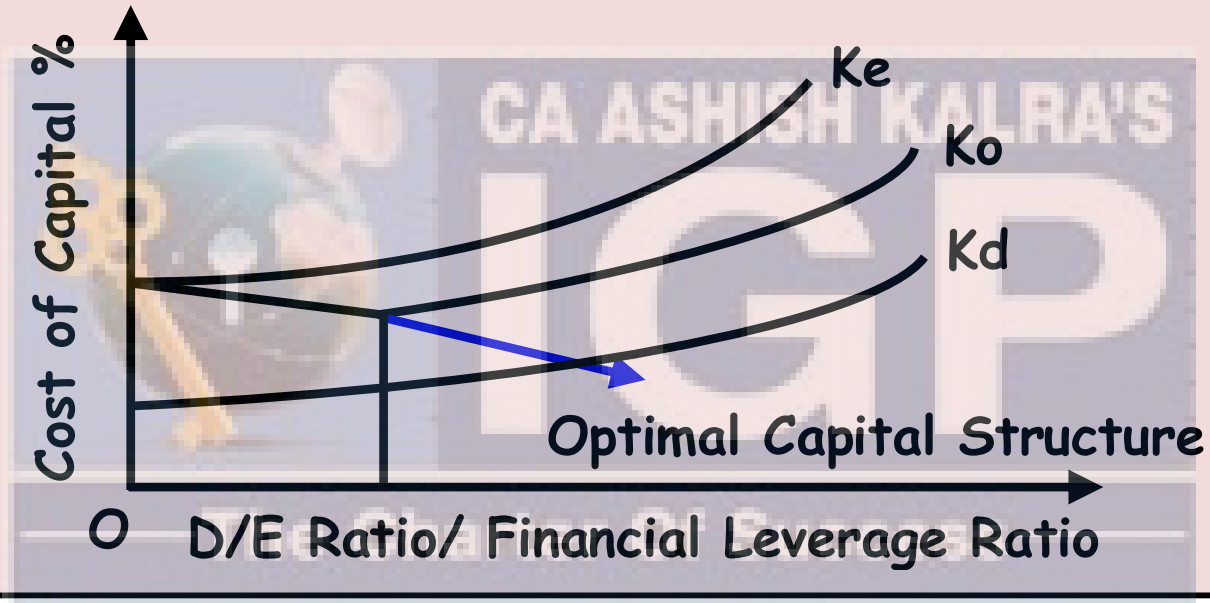
$$V_{EU} = V_U$$

$$V_{EL} = V_L - V_D$$

$$Ke_L = \frac{EBIT - I}{V_{EL}}$$

TRADITIONAL APPROACH

V_F increases with an **increase in leverage** but upto a certain **limit** only. **Beyond** this **limit**, an increase in leverage will increase its Ko & hence the **V_F** will **decline**. A Capital **structure** is said to be optimum at that **level** of **D/E Ratio** where **Ko** is the **least**.



MM I (1958) (WITHOUT TAXATION)

Proposition I: V_F is independent of level of leverage & is determined by capitalising Net Operating Profits with Ko.

$$V_L = V_U$$

$$V_F = \frac{EBIT}{Ko}$$

Proposition II: K_{eL} rises with the rise in leverage & is the sum of Keu & Risk Premium on account of increase in leverage which sets off completely the benefits of introduction of less costly debt funds.

$$K_{eL} = K_{eu} + (K_{eu} - K_d) \times \frac{D}{E}$$

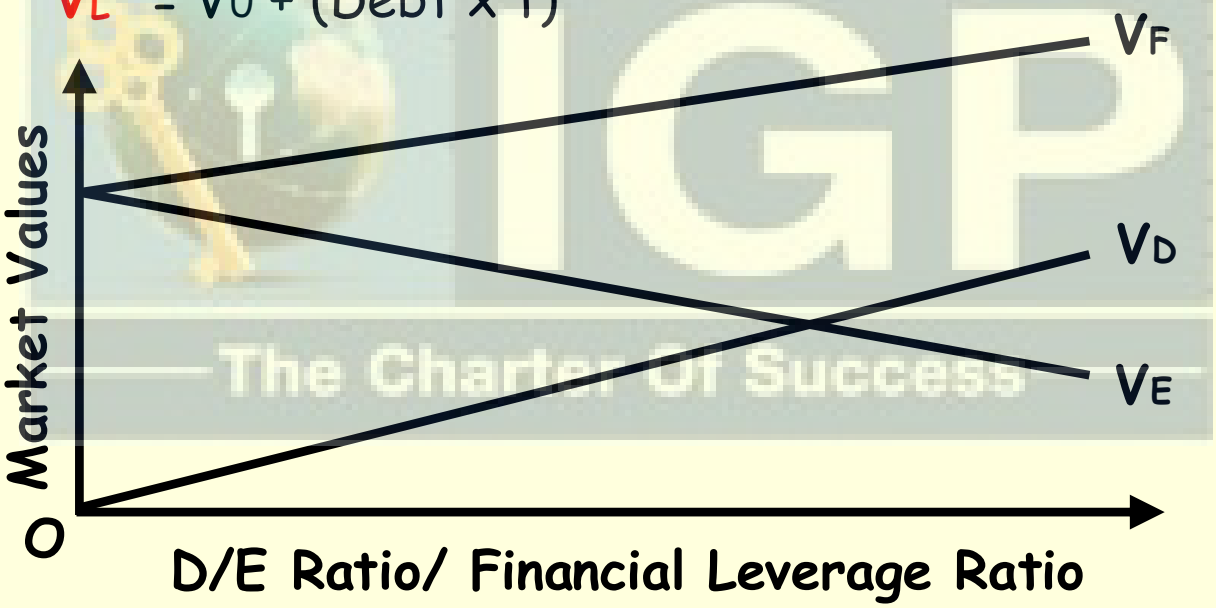
Proposition III: Required rate of return /cut off rate for investment purposes is the overall capitalisation rate (Ko) which is independent of the level of leverage.

$K_{oL} = K_{ou}$

MM II (1963)
(WITH CORPORATE TAXATION)

Proposition I: V_F rises with the rise in leverage & is determined by capitalising NOPAT with Ko.

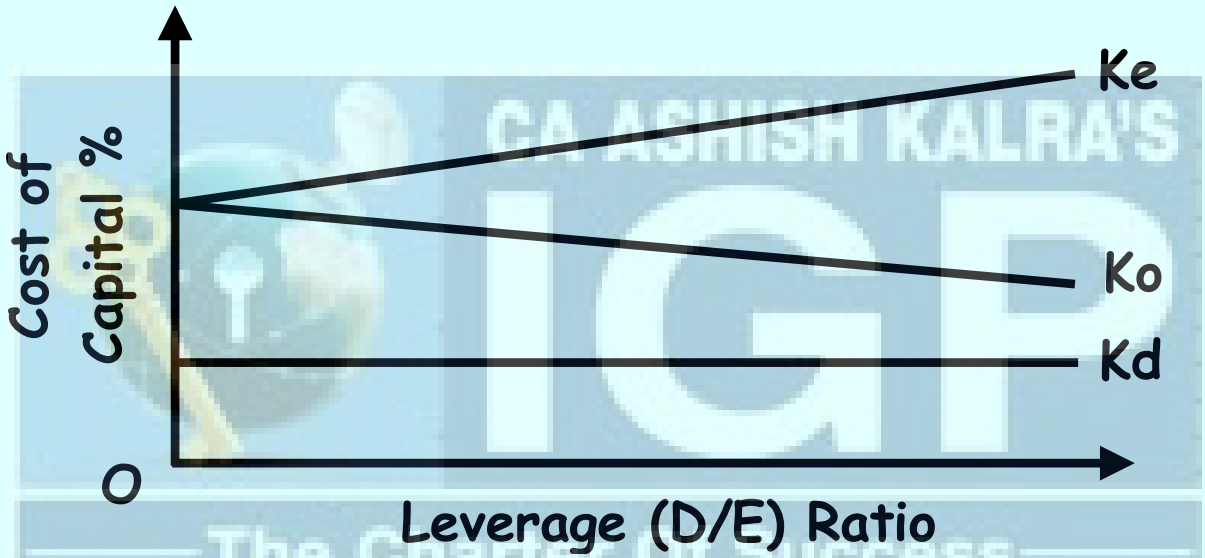
- $V_L > V_U$
- $V_F = \frac{EBIT(1 - t)}{Ko}$
- V_L = V_U + PV of Interest Tax Shield
- $V_L = V_U + (Debt \times t)$



Proposition II: Ke of a Levered Firm (KeL) rises due to the increase in financial risk but at a lower rate due to the feature of corporate taxation which is saved on account of debt.

$$K_{eL} = K_{eu} + (K_{eu} - K_d) \times \frac{D}{E} (1 - t)$$

$K_{oL} < K_{ou}$



Proposition III: The required rate of return/cut off rate for investment purposes is the overall capitalisation rate (Ko) which is no longer independent of the level of leverage & hence Ko decreases on account of tax savings on debt amount.

$K_{oL} < K_{ou}$

ARBITRAGE PROCESS ADVOCATED BY MM

(A) Levered to Unlevered Firm:

Step 1: Sell stake in Levered Firm at Market Price & take personal borrowings (at Corporate Rate of Interest) to maintain the level of Personal Leverage to the level of Corporate Leverage.

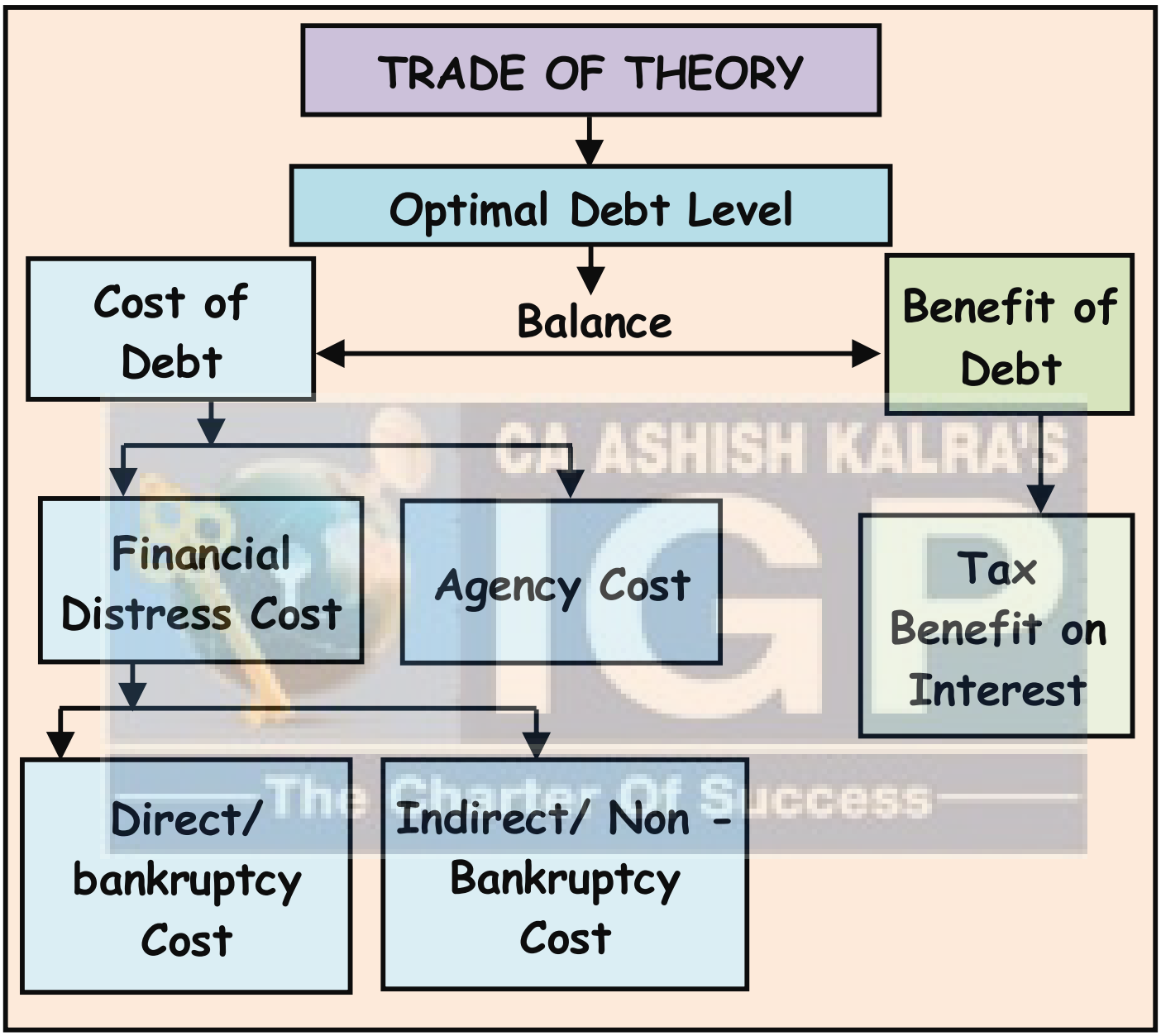
Step 2: Invest in shares of Unlevered Firm. The dividends income received from the Unlevered Firm will be reduced by personal interest & the excess amount against dividends lost in Levered Firm is Arbitrage Gain.

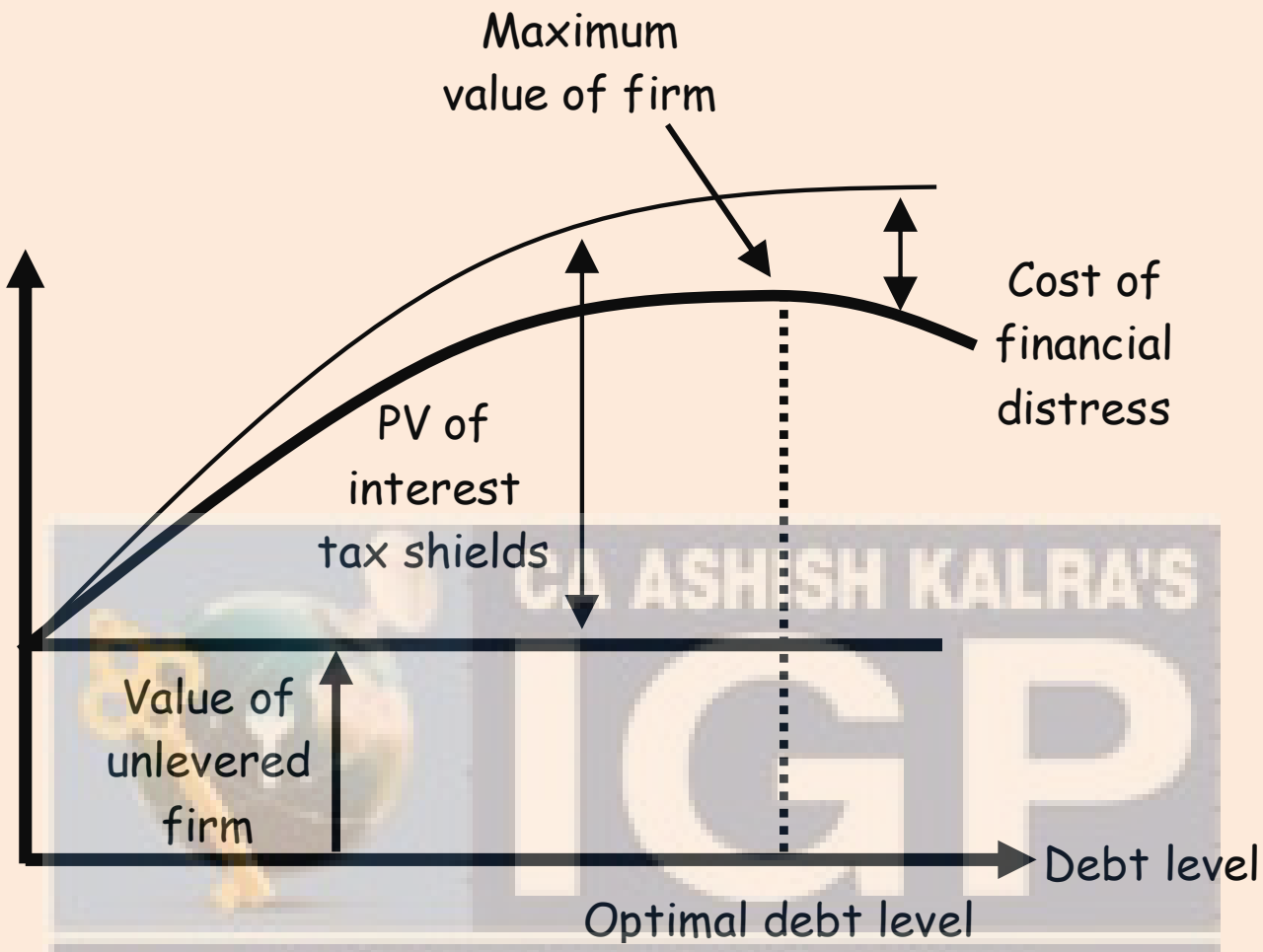
(B) Unlevered Firm to Levered Firm:

Step 1: Sell stake in Unlevered Firm at Market Price & buy shares in Levered Firm along with risk free lending at same rate as Corporate Rate of Interest in a manner that stake in Equity & Debt (in percentage) is the same.

Step 2: Receive dividends from Levered Firm along with interest on risk free lending. Compare the amount received with the amount of dividends lost in Unlevered Firm & the excess amount in hand is Arbitrage Gain.

THE TRADE-OFF THEORY:





PECKING ORDER THEORY

The firms rely for finance as much as they can on internally generated funds. If not enough, then they will move to additional debt finance. It is only when these two sources cannot provide enough funds to satisfy needs that the company will seek to obtain new equity finance.

IMPACT OF CORPORATE INCOME TAX ON NI APPROACH

$K_{eu} = K_{eL}$

$V_u = V_{EU} = \frac{EBIT\ (1 - t)}{K_{eu} \text{ or } K_{ou}}$

$V_{EL} = \frac{(EBIT - I)(1 - t)}{K_{eL}}$

$V_L = V_{EL} + V_D$

$K_{OL} = \frac{EBIT(1 - t)}{V_L}$

IMPACT OF CORPORATE INCOME TAX ON NOI APPROACH

$$Vu = \frac{EBIT\,(1 - t)}{Keu/Kou}$$

Where,

Keu = Equity Capitalisation Rate of an Unlevered Firm

Kou = Overall Cost of Capital of an Unlevered Firm

$$V_L = Vu + (V_D \times t)$$

$$K_{OL} = \frac{EBIT(1 - t)}{V_L}$$

$$K_{eL} = Keu + (Keu - Kd)\frac{D(1 - t)}{E}$$

DIVIDEND DECISION

DIVIDEND POLICIES

	Types of Dividend Policy	Amount of Dividends Payable
1	**Constant Dividends Per Share Policy**	Same amount of DPS every year
2	**Constant Dividends Payout Policy**	Same percentage of earnings as dividends every year
3	**Constant Dividends Per Share with extra Dividends if Company earns above a certain level**	Same amount of DPS every year & extra DPS if EPS of Company increases beyond a certain level
4	**Constant Dividends Payout Policy with minimum guaranteed dividends**	Same % of earnings as dividends every year subject to minimum guaranteed dividends per share

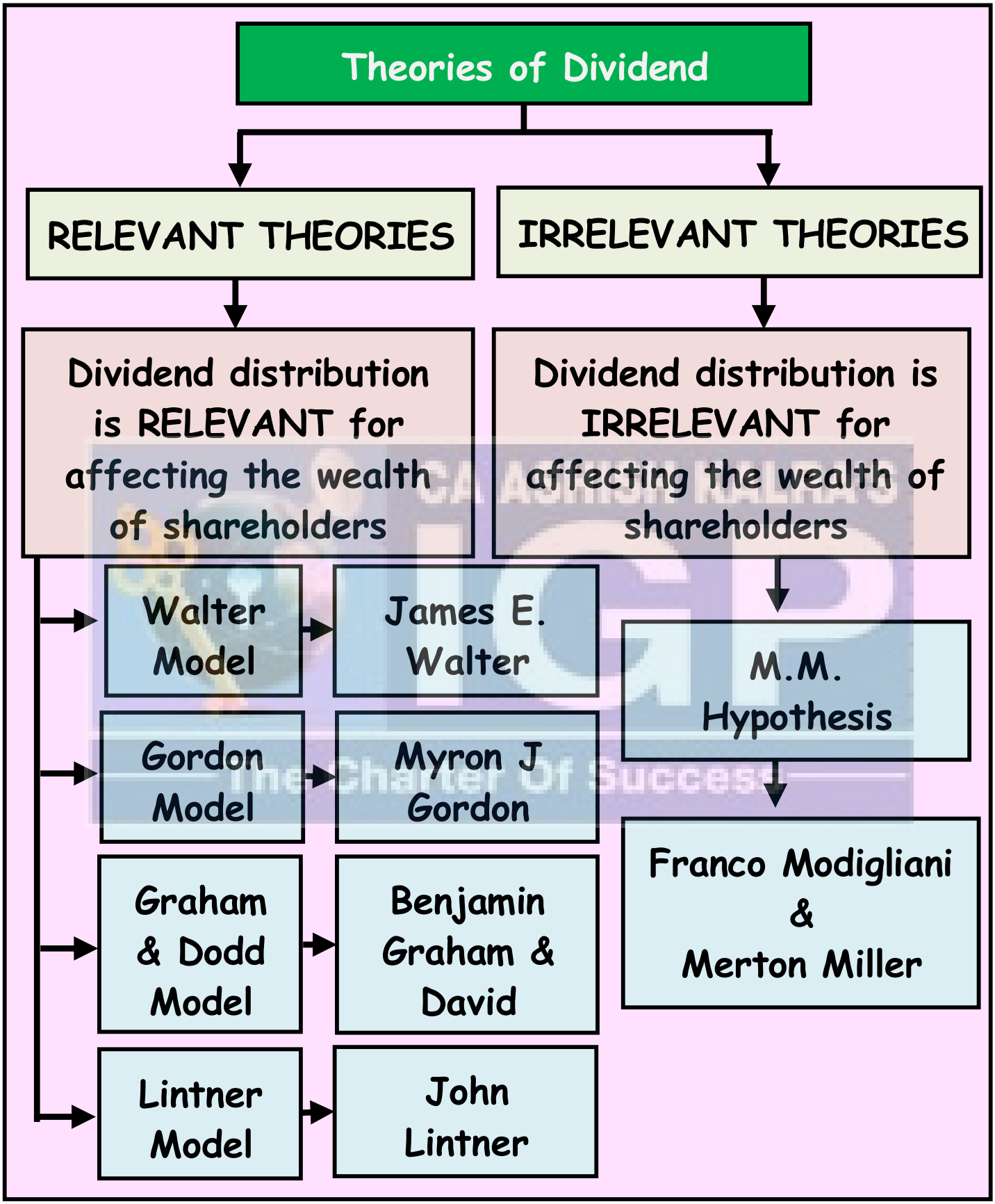
5	**Stable Dividends Policy**	Steady dividends every year & increase/ decrease in dividends only if its earnings have reached a higher/lower permanent level
6	**Residual Income Dividends Policy**	Pay residual income in hand remaining after meeting viable Capital expenditures in hand as dividends

Ex dividend = Cum Dividend – DPS included therein

EVALUATION OF VIABLE CAPITAL EXPENDITURE:

*If IRR of proposed project is ≥ cost of capital of the company = Invest

*If NPV of the proposed Project is ≥ 0 = Invest


Theories of Dividend
RELEVANT THEORIES
IRRELEVANT THEORIES
Dividend distribution is RELEVANT for affecting the wealth of shareholders
Dividend distribution is IRRELEVANT for affecting the wealth of shareholders
Walter Model
James E. Walter
Gordon Model
Myron J Gordon
Graham & Dodd Model
Benjamin Graham & David
Lintner Model
John Lintner
M.M. Hypothesis
Franco Modigliani & Merton Miller

WALTER'S MODEL

$$P_0 = \frac{D + (r/Ke)(E - D)}{Ke}$$

$$Ke = \text{Cost of Equity} = \frac{EPS}{MPS} = \frac{1}{P/E \text{ Ratio}}$$

OPTIMAL DIVIDEND POLICY

r > Ke, 100% retention
r < Ke, 100% dividends payout
r = Ke, Pay & retain in any proportion

LINTNER'S MODEL

$$D_1 = (E \times D/P \text{ Ratio} \times \text{Adj Rate}) + D_0 (1 - \text{Adj Rate})$$

Earnings	Adj Rate
Stable	near to 1
Volatile	near to 0

TRADITIONAL MODEL (GRAHAM & DODD)

$$P = m (D + E/3)$$

$$P = m \{D + (D + R)/3\} = m (4D/3) + m (R/3)$$

MM MODEL/IRRELEVANT THEORY

1. $P_1 = P_0 (1 + Ke) - D$

2. $P_0 = \frac{D_1 + P_1}{1 + Ke}$

3. **Additional No. of Equity Shares to be issued at the end of year 1** $= \frac{I_1 - (E - D)}{P_1}$

4. **Market Capitalisation of Equity Shares** = (No. of Equity Shares x MPS)

5. **Ke** = EPS/MPS or 1/PE ratio

Market Capitalisation	=	Total no. of equity shares x MPS
Free float market capitalisation	=	(Total no. of equity shares - No. of equity shares held by promoters) x MPS

DIVIDEND DISCOUNT MODEL (DDM)

Intrinsic Value = Sum of PV of Future Cash Flows
= Sum of PV of Dividends + PV of Stock Sale Price

$$\text{Intrinsic Value} = \frac{D_1}{(1+Ke)^1} + \frac{D_2}{(1+Ke)^2} + \ldots + \frac{D_n}{(1+Ke)^n} + \frac{SP_n}{(1+Ke)^n}$$

(A) Zero Growth Rate DDM:

Stock's Intrinsic Value or P_0 $= \left(\frac{D}{Ke}\right)$

(B) Constant Growth Rate DDM or Gordon Model:

Stock's Intrinsic Value or P_0 $= \left(\frac{D_1}{Ke - g}\right)$

Or, $P_0 = \frac{E(1-b)}{Ke - br} = \frac{D_0(1+g)}{Ke - g} = \frac{D_1}{Ke - g}$

(C) Variable Growth Rate DDM:

Stock's Intrinsic Value or P_0 =

PV of dividends receivable during abnormal growth period + PV of market price at the end of the abnormal growth period

BUY BACK OF SHARES

Expected Post Buy Back EPS = $\dfrac{\text{Earnings Available for Equity Shareholders}}{\text{No. of Equity Shares before Buy Back} - \text{No. of Equity Share bought back}}$

Post Buy Back MPS = Expected Post Buy Back EPS × Expected Post Buy Back P/E Ratio

Total amount required for Buy Back = No. of shares to be bought back × Buy Back Price per share

Market capitalisation after buy back = Post buy back MPS × (Original No. of equity shares – No. of equity shares bought back)

No. of equity shares to be bought back = $\frac{\text{Amount to be used to buyback equity shares}}{\text{Buyback price per share}}$

STOCK SPLIT & REVERSE SPLIT

(1) Stock Split:

(i) **Revised Par Value after Stock Split** = $\frac{\text{Par Value before Stock Split}}{\text{Stock Split Ratio}}$

(ii) **Revised No. of Equity Shares after Stock Split** = Old No. of Equity Shares × Stock Split Ratio

(iii) **Revised MPS after Stock Split** = $\frac{\text{MPS before Stock Split}}{\text{Stock Split Ratio}}$

(2) Reverse Split/Consolidation:

(i) **Revised Par Value after Reverse Split** = Par Value before Reverse Split x Reverse Split Ratio

(ii) **Revised No. of Equity shares after Reverse Split** = $\frac{\text{Old No. of Equity Shares}}{\text{Reverse Split Ratio}}$

(iii) **Revised MPS after Reverse Split** = MPS before Reverse split x Reverse Split Ratio

BONUS ISSUE

(i) **No. of Bonus shares to be issued to existing equity shareholders** = No. of equity shares x Ratio of Bonus shares to be issued

(ii) **Post bonus issue MPS** = $\frac{\text{Market capitalisation of Equity shares before bonus issue}}{\text{Total No. of Equity shares after Bonus issue}}$

(iii) **Change in Equity account on account of bonus issue** = Reserves & surplus will reduce & ESC will increase

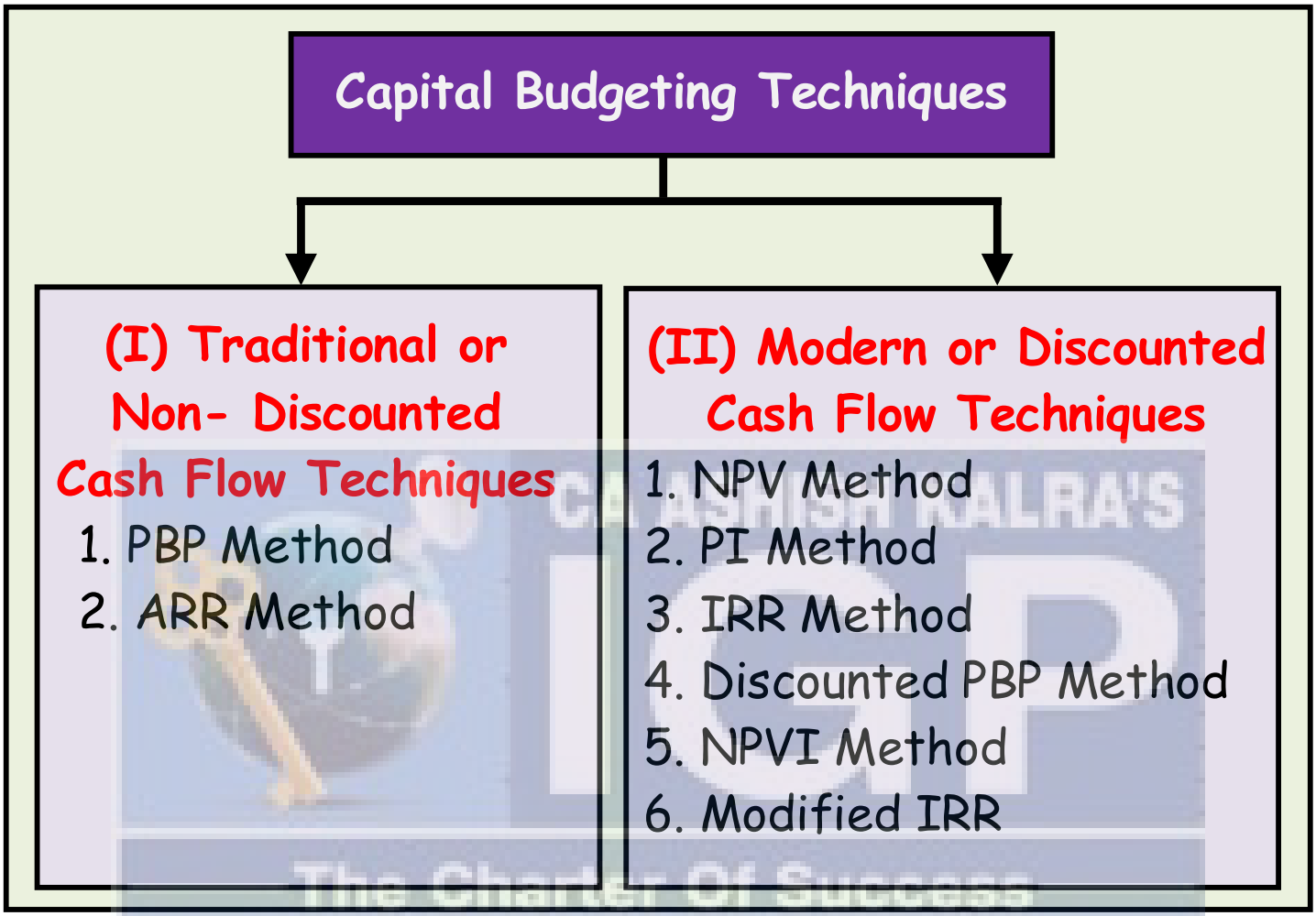
CAPITAL BUDGETING

EVALUATION OF LONG TERM INVESTMENT PROPOSALS

PROJECT CASH FLOWS

Particulars	(₹)
a) Initial Cash Outflows:	
Cost of New Fixed Asset(s)	xxx
Add: Investment in Net Working Capital (if any)	xxx
Initial Cash Outflows	**xxx**
b) Cash Inflows:	
Operating Revenue	xxx
Less: Operating Expenses excluding depreciation	(xxx)
Cash Flows Before Tax (CFBT) (1)	**xxx**
Less: Depreciation	(xxx)
Profits Before Tax (PBT)	**xxx**
Taxes (2)	xxx
Cash Flows After Tax (CFAT) (1) - (2)	**xxx**
C) Terminal Cash Flows:	
Salvage Value of asset (Net of Disposal Costs) (Net of Capital Gains Tax Liability/ Tax Savings on losses)	xxx
Add: Recovery of Net Working Capital (if any)	xxx
Terminal Year Net Cash Flows	**xxx**

CAPITAL BUDGETING TECHNIQUES



PAYBACK PERIOD (PBP) METHOD

Case I: If the anticipated Net Annual Cash Inflows are of equal amounts against the initial investment:

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

Case II: If the Net Annual Cash Inflows are of unequal amounts:

Payback Period is computed by adding up the Net Annual Cash Inflows until the total is equal to the Initial Cash Outlay.

ACCOUNTING RATE OF RETURN (ARR)

$$\text{ARR} = \frac{\text{Average PAT}}{\text{Initial Investment/Capital Employed}} \times 100$$

$$\text{OR ARR} = \frac{\text{Average PAT}}{\text{Average Investment/Capital Employed}} \times 100$$

$$\text{Average PAT} = \frac{\sum \text{PAT over the lifetime of project}}{\text{Project life}}$$

$$\text{Average Capital Employed} = \frac{\text{Opening Investment} + \text{Terminal Value}}{2}$$

Where, Annual PAT = Annual CFAT - Depreciation

NET PRESENT VALUE (NPV) METHOD

NPV = PV of Cash Inflows – PV of Cash Outflows

$$NPV = \frac{-CF_0}{(1+k)^0} + \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \ldots\ldots\ldots + \frac{CF_n}{(1+k)^n}$$

Where, CF_0 = Cash outflows at Time 0 i.e. Cost of Fixed Assets, Working Capital etc.

CF_n = Cash Inflow at the end of year n

n = Life of the Project

k = Cost of Capital used as the Discount Rate

PROJECT NPV VS EQUITY NPV

	Project NPV	Equity NPV
1	Considers Project's long term Cash Outflows irrespective of its source of finance.	Considers Cash Outflows from Equity funds only.
2	Considers Operating CFAT plus Terminal Value as Cash Inflows or FCFF (Free Cash Flows of Firm)	Considers CFAT for Equity plus Terminal Value as Cash Inflows or FCFE (Free Cash Flows for Equity).

3	Discount Rate = Ko	Discount Rate = Ke
4	Accept the project, if Project NPV ≥ 0.	Accept the proposal, if Equity NPV ≥ 0.

EVALUATION OF MUTUALLY EXCLUSIVE PROPOSALS HAVING UNEQUAL LIVES

Case 1:- When only Cash Outflows are known:
Choose the proposal having Lower Equivalent Present Value of Cash Outflows (EAPVCO)

$$\text{EAPVCO} = \frac{\text{PVCO}}{\text{PVAF of years of benefit}}$$

Case 2:- When both Cash Outflows & Inflows are known: Choose the proposal having higher Equivalent Annual Net Present Value (EANPV)

$$\text{EANPV} = \frac{\text{NPV}}{\text{PVAF of years of benefit}}$$

INTERNAL RATE OF RETURN

IRR = Discount Rate which makes the NPV of the project under consideration = 0.

OR PI = 1 OR PVCO = PVCI

$$0 = \frac{-CF_0}{(1+r)^0} + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \ldots\ldots + \frac{CF_n}{(1+r)^n}$$

Where, CF_0 = Cash outflows at Time 0 i.e. Cost of Fixed Assets, Working Capital etc.

CF_n = Cash Inflow at the end of year n

r = Discount Rate (IRR)

n = Life of the Project

PROJECT IRR v/s EQUITY IRR

	Project IRR	Equity IRR
1.	Considers Project's long term Cash Outflows irrespective of its source of finance.	Considers Cash Outflows from Equity funds only.
2.	Considers Free Cash flows of firm or FCFF as Cash Inflows.	Considers FCFE (Free Cash Flows for Equity) as Cash Inflows.

3.	Accept the project, if project IRR ≥ Ko.	Accept the proposal, if Equity IRR ≥ Ke.

PROFITABILITY INDEX (PI) METHOD/ DESIRABILITY FACTOR/ BENEFIT-COST (B/C) RATIO TECHNIQUE

$$\text{PI} = \frac{\text{Present Value of Cash Inflows (PVCI)}}{\text{Present Value of Cash Outflows (PVCO)}}$$

DISCOUNTED PAYBACK PERIOD (PBP) METHOD

Discounted PBP = Period within which the PVCI completely recovers the PVCO. Discounted PBP is computed by calculating Cumulative PVCI till it becomes equal to PVCO.

Appropriate discount rate = Cost of Capital of the Firm.

NET PRESENT VALUE INDEX (NPVI)

$$NPVI = \frac{NPV}{\text{Initial Cash Outflows}}$$

MODIFIED INTERNAL RATE OF RETURN (MIRR)/ TERMINAL RATE OF RETURN

All cash flows, apart from the Initial Investment, are brought to the terminal value using an appropriate discount rate (the cost of capital). This results in a single stream of cash inflow in the terminal year. The discount rate which equates the present value of the terminal cash inflow to the zeroth year outflow is called MIRR.

$$CF_0 = [CF_1 \times (1+k)^{n-1} + CF_2 \times (1+k)^{n-2} + \ldots\ldots + CF_n] \times \frac{1}{(1+MIRR)^n}$$

PROJECTS WITH SYNERGIES

Choose the Combination of Projects that is expected to yield the highest overall NPV.

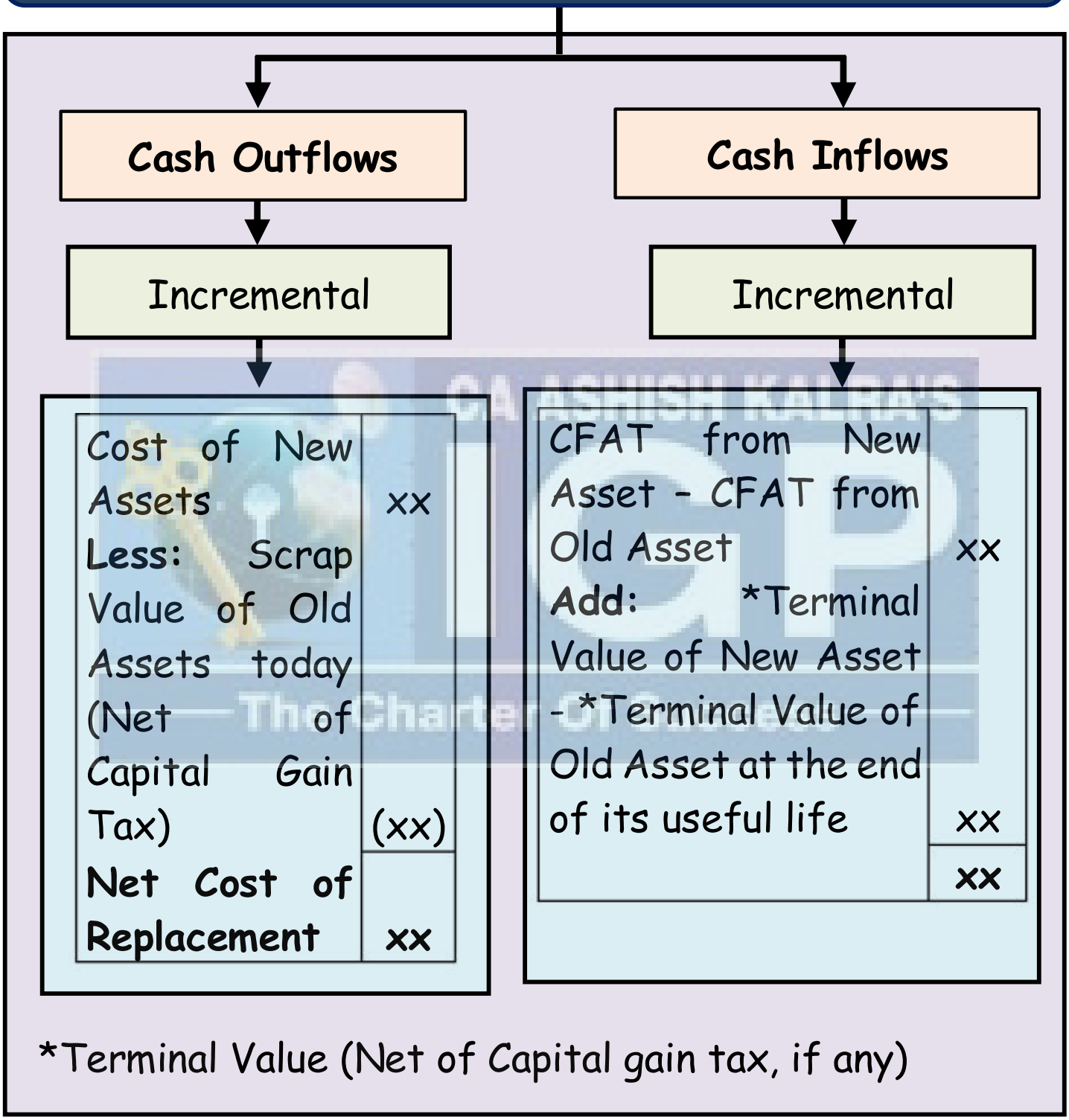
TREATMENT OF SUBSIDY IN MAKING DCF EVALUATION

(1) **Subsidy receivable for installation of an Industrial Undertaking in a SEZs or Backward Area (BA) or Backward District:** Either add subsidy receivable in Cash Inflows or **reduce it from Cash Outflows**.

(2) **Subsidy for installation or purchase of an asset (E.g. pollution control equipment):** Either add subsidy receivable in Cash Inflows or **reduce receivable from Cash Outflows**. The **depreciation** allowed for tax purposes is on the **cost of asset purchased as reduced by the amount of subsidy received**.

(3) **Export Subsidy: Add export subsidy to Sales** Revenue in order to determine CFAT as export subsidy is a taxable income.

REPLACEMENT DECISION



*Terminal Value (Net of Capital gain tax, if any)

Resultant NPV > 0	Replace
= 0	Replace/Continue old
< 0	Continue Old

CAPITAL RATIONING

Techniques of dealing with Capital Rationing:

(I) PI Technique:

PI is useful to rank the most desirable project mix if all the following conditions are fulfilled:

1. All Cash Outflows for all projects are at 0 period.
2. None of the projects are mutually exclusive.
3. All projects are Infinitely Divisible.

The allocation of funds is made in accordance with the rankings given to all viable projects.

(II) NPVI Technique:

NPVI is useful to rank the most desirable project mix if all the following conditions are fulfilled:

1. Funds are scarce today only.
2. None of the projects are mutually exclusive.
3. All projects are Infinitely Divisible.

The allocation of funds is made in accordance with the rankings given to all viable projects.

(III) Trial and Error Method:

Make combination of project mix from the funds available for Investment. The combination of projects which gives highest overall NPV will be the most desirable Project Mix.

NPV v/s IRR

In case of choice amongst mutually exclusive proposals, NPV & IRR may give contradictory indications under the following conditions:

1. Projects have different life expectancies.
2. Projects have different sizes of investment.
3. Projects' cash flows differ over time.
4. Different Reinvestment Rate assumptions of Intermediary Cash Flows as NPV method uses Cost of Capital whereas IRR method uses IRR as the implied Reinvestment Rate.

In case of inconsistency, the project yielding larger NPV is preferred because cost of capital is a more realistic reinvestment rate & IRR is a percentage but the magnitude of cash flow is important.

Also, Multiple IRR may arise if projects have non-conventional cash flows.

NPV v/s PI

Generally, a project offering a PI > 1 must also offer a positive NPV. But a conflict may arise between two methods if a choice between mutually exclusive projects has to be made. If we have to select one project out of two mutually exclusive projects, the NPV should be preferred because NPV indicates the economic contribution of the project in absolute terms. As such a project which gives higher economic contribution should be preferred.

This is because NPV gives ranking on the basis of absolute value of rupees whereas PI gives ranking on the basis of ratio. PI method is a better evaluation technique than NPV in a situation of Capital Rationing only.

APPLICATION OF BLOCK OF ASSETS CONCEPT IN DCF EVALUATIONS

Block of Assets

That there are other assets in the block of assets

- Charge normal depreciation in the last year of operation of assets.
- No Capital Gain/Loss will be computed in the last year of operation unless the Sale Proceeds exceeds the WDV of the Block.

That there are no other assets in the block of assets

- No depreciation will be charged in the last year of operation of asset (since the block will cease to exist in the last year) & Capital gain/loss = Sale Proceeds of asset – WDV of the asset in the beginning of the last year. **or**
- Depreciation will be charged in the last year of operation at normal rate & Capital gain/loss = Sale Proceeds of assets – WDV of asset at the end of last years.

RISK ANALYSIS IN CAPITAL BUDGETING

COMPUTATION OF STANDARD DEVIATION

When cash flows are dependent over time:

$$\sigma_{NPV} = \sqrt{\begin{matrix}(NPV_1 - \text{Mean NPV})^2 \times Prob_1 + \\ (NPV_2 - \text{Mean NPV})^2 \times Prob_2 + \ldots + \\ (NPV_n - \text{Mean NPV})^2 \times Prob_n\end{matrix}}$$

COEFFICIENT OF VARIATION

$$\text{Coefficient of Variation} = \frac{\text{Standard Deviation of Expected NPV } (\sigma)}{\text{Mean or Expected NPV } (\bar{x})}$$

SENSITIVITY ANALYSIS

Sensitivity Analysis **evaluates** the **robustness** of a project by giving answers to **"what if"** type questions. This technique provides information as to **how sensitive the estimated project parameters** namely: the **Project Cost**, **expected Cash Inflows**, the **Discount rate** and the **Project life**, are to estimation errors. It takes care of estimation errors by using a number of possible outcomes in evaluating a project.

Thus, it is a technique of risk analysis which studies the responsiveness of a criterion of merit like **NPV or IRR** to variation in underlying factors like selling price, quantity sold, returns from an Investment etc.

Sensitivity Analysis involves three steps:

1. Identification of all those variables having an influence on the project's NPV or IRR.
2. Definition of the underlying quantitative relationship among the variables.
3. Analysis of the impact of the changes in each of the variables on the NPV of the project.

SCENARIO ANALYSIS

Scenario Analysis considers the probabilities of changes in key variables and also allows decision makers to change more than one variable at a time.

This analysis begins with base case or most likely set of values for the input variables. Then it analyses the worst case scenario (low unit sales, low sales price, high variable cost and so on) and the best case scenario (high unit sales, high sales price, low variable cost & so on). In other words, scenario analysis answers the question "how bad could the project look".

Scenario analysis contains **four critical components:**

1. Determination of factors around which the scenarios will be built, such as state of economy, response of competitors on any action of the firm.
2. Determination of number of scenarios to analyse for each factor e.g. a best case, most likely and a worst case scenario.
3. Building of few scenarios for each factor by focusing on critical factors.
4. Assignment of probabilities to each scenario on the basis of macro factors e.g. exchange rates, interest rates etc., or micro factors e.g. competitor's reactions etc.

NPV of various scenarios will be computed and the final decision of acceptance / rejection is usually made by computing Mean NPV.

CERTAINTY EQUIVALENT (CE) APPROACH

Step 1: Determine certain Cash Flows from risky cash flows by multiplying each risky cash flow by the appropriate CE coefficient.

Step 2: Determine Present Value of Cash Flows by discounting the certain cash flows with Risk Free rate of Interest.

Step 3: Thereafter the normal capital budgeting techniques are used such as NPV and IRR.

Note: If CE coefficient is not given then we shall compute it as follows:

$$\text{CE Coefficient} = \frac{\text{Certain Cash Flows}}{\text{Risky or Expected Cash Flows}}$$

RISK ADJUSTED DISCOUNT RATE (RADR) APPROACH

1. Compute Coefficient of Variation (CV) of the NPV of the proposed projects and the project having higher CV will be discounted with higher discount rate.
2. The Project having lower CE factor will be evaluated with a higher discount rate.
3. Beta factors or Risk Index of proposed projects may be estimated & RADR may be computed as follows:

$$RADR = Rf + \beta p\ (Ko - Rf)$$

Alternatively, RADR can also be computed as follows:

$RADR_P$ = Rf + Adjustment for Firm's Normal Risk + Adjustment for differential risk of the project

OR, $RADR_P = Rf + \beta_F\ (Ko - Rf) + \beta_{P-F}\ (Ko - Rf)$

FINANCIAL STATEMENT ANALYSIS

PROFITABILITY RATIOS BASED ON SALES (INCOME STATEMENT PROFITABILITY RATIOS)

1. Cost of Goods Sold (COGS) Ratio:

COGS Ratio = $\frac{\text{Cost of Goods Sold}}{\text{Net Sales}} \times 100$

Where, COGS of a Trader = Opening Stock + Net Purchases + Direct Expenses – Closing Stock

COGS of a Manufacturer = Opening Stock of Finished Goods + Factory Cost of Production – Closing Stock of Finished Goods

Net Sales = Total Sales – Sales Return

2. Gross Profit (GP) Ratio or Gross Margin Percentage:

Gross Profit Ratio = $\frac{\text{Gross Profit}}{\text{Net Sales}} \times 100$

Where, Gross Profit (GP) = Net Sales – COGS

Relationship between COGS Ratio & GP Ratio:

COGS Ratio = 100 – GP Ratio

GP Ratio = 100 – COGS Ratio

3. Expense Ratio:

1. **COGS ratio** has been discussed above
2. **Office & Admin Exp Ratio** = $\frac{\text{Office \& Admin Exp.}}{\text{Net Sales}} \times 100$
3. **S & D Expenses Ratio** = $\frac{\text{S \& D Expenses}}{\text{Net Sales}} \times 100$
4. **Fixed Expenses Ratio** = $\frac{\text{Fixed Operating Expenses}}{\text{Net Sales}} \times 100$
5. **Variable Expenses Ratio** = $\frac{\text{Variable Expenses}}{\text{Net Sales}} \times 100$

4. Profit/Volume (P/V) Ratio/ Contribution/Sales Ratio:

P/V Ratio = $\frac{\text{Contribution}}{\text{Sales}} \times 100$

Where, Contribution = Sales – Variable Cost

OR = Fixed Cost + Profit - Loss

5. Operating Ratio:

Operating Ratio

$$= \frac{\text{Cost of Goods Sold + Other Operating Exp.}}{\text{Net Sales}} \times 100$$

OR = Cost of Goods Sold ratio + Office & Admin Exp. ratio + S & D Exp. ratio

6. Net Operating Profit Ratio:

Net Operating Profit Ratio $= \frac{\text{Net Operating Profits or EBIT}}{\text{Net Sales}} \times 100$

Where, EBIT = Gross Profit – Other Operating Expenses

OR = Net Sales – Variable cost – Fixed Cost

Relationship between Net Operating Profit Ratio & Operating Ratio:

Net Operating Profit Ratio = (100 – Operating Ratio)

Operating Ratio = (100 – Net Operating Profit Ratio)

7. Net Profit Ratio:

Net Profit Ratio $= \frac{\text{Net Profit}}{\text{Net Sales}} \times 100$

Where, Net Profit = Profits after Tax (PAT)

PROFITABILITY RATIOS BASED ON CAPITAL & INVESTMENT

1. Return on Capital Employed or Return on Investment:

$$\text{Return on Capital Employed} = \frac{\text{EBIT}}{\text{Capital Employed}} \times 100$$

Where, Capital Employed = Equity Share Capital + Reserves & Surplus + Preference Share Capital + Long Term Debt - Fictitious Assets & Losses - Non Trade Assets - P&L A/c (Dr.)

OR = Net Fixed Assets (including Intangible Fixed Assets) + Net Working Capital + Trade Investments

2. Return on Equity (ROE):

(a) Return on Total Shareholder's Funds/Net Worth:

Return on Shareholder's Funds Ratio = $\frac{\text{EAT}}{\text{Shareholders' Funds}} \times 100$

(b) Return on Equity Shareholder's Funds

Return on Equity Shareholder's Funds Ratio = $\frac{\text{EAE}}{\text{Equity Shareholders' Funds}} \times 100$

Where, Equity Shareholders' Funds = Equity Share Capital + Reserves & Surplus (Preferably excluding Revaluation Reserve) - Fictitious Assets and Losses - P&L A/c (Dr.)

Shareholders' Funds/Net Worth/Proprietor's Funds/ Owner's Equity = Equity Shareholders Funds + Preference Share Capital

3. Return on Operating Assets:

Return on Operating Assets = $\frac{\text{NOPAT}}{\text{Operating Assets}} \times 100$

Where,

NOPAT = EBIT (1 - Income Tax Rate)

Operating Assets = Total Assets [excluding Fictitious Assets & P&L A/c (Dr.)] - Non Trade Assets

4. Return on Total Assets:

$$\text{Return on Total Assets} = \frac{\text{Net Profit after Tax}}{\text{Total Assets}} \times 100$$

Where, Total Assets = Total Assets side of Balance Sheet (excluding Fictitious Assets)

ACTIVITY OR PERFORMANCE OR TURNOVER RATIOS

1. Fixed Assets Turnover Ratio:

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Net Fixed Assets}}$$

Where, Net Fixed Assets = Gross Fixed Assets - Accumulated Depreciation

2. Total Assets Turnover Ratio:

$$\text{Total Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

3. Current Assets Turnover Ratio:

$$\text{Current Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Current Assets}}$$

4. Capital Turnover Ratio:

$$\text{Capital Turnover Ratio} = \frac{\text{Net Sales}}{\text{Capital Employed}}$$

5. Net Working Capital Turnover Ratio:

$$\text{Net Working Capital Turnover Ratio} = \frac{\text{Net Sales}}{\text{Net Working Capital}}$$

Where, Net Working Capital = Current Assets - Current Liabilities

6. Debtors Turnover Ratio/Receivables Turnover Ratio:

$$\text{Debtors Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Debtors \& B/R}}$$

Where, Net Credit Sales = Net Total Sales - Cash Sales

7. Stock or Inventory Turnover Ratio:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold/Cost of Sales}}{\text{Stock in Trade/Finished Goods}}$$

Note: In case COGS cannot be determined, take Sales.

8. Raw Material Turnover Ratio:

$$\text{Raw Materials Turnover Ratio} = \frac{\text{Raw Materials Consumed}}{\text{Inventory of Raw Materials}}$$

Where, Raw Materials Consumed = Opening Stock of Raw Materials + Net Purchase of Raw Materials - Closing Stock of Raw Materials

9. Work in Progress Turnover Ratio:

$$\text{Work in Progress Turnover Ratio} = \frac{\text{Net Factory Cost}}{\text{Inventory of WIP}}$$

Where, Net Factory Cost = Raw Materials Consumed + Conversion Costs + Opening Stock of Work in Progress - Closing Stock of Work in Progress

10. Creditors (or Accounts Payable) Turnover Ratio:

$$\text{Creditors Turnover Ratio} = \frac{\text{Net Credit Purchases}}{\text{Creditors \& B/P}}$$

Where, Net Credit Purchases = Net Total Purchases - Cash Purchases

11. Average Collection Period:

$$\text{Average Collection Period} = \frac{360/12/52}{\text{Debtors Turnover Ratio}}$$

OR $= \frac{\text{Debtors \& Bill Receivables}}{\text{Net Credit Sales}} \times 360/12/52$

12. Average Inventory Conversion/Holding Period:

$$\text{Average Finished Goods Conversion Period/Avg. Stock in Trade Holding Period} = \frac{360/12/52}{\text{Stock Turnover Ratio}}$$

OR $= \frac{\text{Stock in Trade/Finished Goods}}{\text{Cost of Goods Sold}} \times 360/12/52$

13. Raw Materials Inventory Conversion Period:

$$\text{Raw Materials Conversion Period} = \frac{360/12/52}{\text{Raw Materials Turnover Ratio}}$$

OR $= \frac{\text{Stock of Raw Materials}}{\text{Raw Materials Consumed}} \times 360/12/52$

14. WIP Inventory Conversion Period:

$$\text{WIP Inventory Conversion Period} = \frac{360/12/52}{\text{WIP Turnover Ratio}}$$

OR $= \frac{\text{Stock of WIP}}{\text{Net Factory Cost}} \times 360/12/52$

15. Average Payment Period:

$$\text{Average Payment Period} = \frac{360/12/52}{\text{Creditors Turnover Ratio}}$$

$$\text{OR} = \frac{\text{Creditors \& Bill Payables}}{\text{Net Credit Purchases}} \times 360/12/52$$

COVERAGE RATIOS

1. Interest Coverage Ratio:

$$\text{Interest Coverage Ratio} = \frac{\text{EBIT}}{\text{Interest on Long Term Debts}}$$

2. Preference Dividends Coverage Ratio:

$$\text{Preference Dividends Coverage Ratio} = \frac{\text{EAT}}{\text{Preference Dividends}}$$

3. Equity Dividends Coverage Ratio:

$$\text{Equity Dividends Coverage Ratio} = \frac{\text{EAE}}{\text{Equity Dividends}} \quad \text{OR} \quad \frac{\text{EPS}}{\text{DPS}}$$

4. Total Dividends Coverage Ratio:

$$\text{Total Dividends Coverage Ratio} = \frac{\text{EAT}}{\text{Total Dividends}}$$

Total Dividends = Equity Dividends + Preference Dividends

5. Fixed Charges Coverage Ratio:

$$\text{Fixed Charges Coverage Ratio} = \frac{\text{EBIT}}{\text{Interest on Long term Debt} + \frac{\text{Pref. Dividends}}{1-t}}$$

6. Debt Service Coverage Ratio:

$$\text{Debt Service Coverage Ratio} = \frac{\text{EAT} + \text{Interest on Long term Debt} + \text{Dep.} + \text{Other Non-cash Expenditures Like Amortisation}}{\text{Interest on Long term Debt} + \text{Installment of Principal}}$$

MARKET TEST OR MARKET STRENGTH ANALYSIS OR INVESTOR ANALYSIS RATIOS

1. Dividends per Share (DPS):

$$\text{Dividends Per Share} = \frac{\text{Dividends for Equity Shareholders}}{\text{Number of Equity Shares}}$$

2. Earnings per Share (EPS):

EPS = Earnings Available for Equity Shareholders (EAE) / Number of Equity Shares

Where, EAE = EAT – Preference Dividends

3. Book Value per Share (BVPS)/Net Asset Value per Share/Theoretical Market Price per share:

Net Asset Value Per Share/BVPS = Equity Shareholders Funds / Number of Equity Shares

4. Dividends Yield in Equity Shares:

Dividends Yield Ratio = DPS x 100 / MPS

5. Earnings Yield Ratio:

Earnings Yield Ratio = EPS x 100 / MPS

6. Dividends Payout Ratio:

Dividends Payout Ratio = DPS x 100 / EPS

OR = 100 – Retention Ratio

7. Retention Ratio:

$$\text{Retention Ratio} = \frac{\text{EPS - DPS}}{\text{EPS}} \times 100$$

OR = 100 - Dividends Payout Ratio

8. Price-Earnings Ratio or P/E Ratio:

$$\text{P/E Ratio} = \frac{\text{MPS}}{\text{EPS}} \quad \text{OR} = \frac{1}{\text{Earnings Yield Ratio}}$$

9. Market Value to Book Value per share:

$$\text{Market Value to Book Value Ratio} = \frac{\text{MPS}}{\text{BVPS}}$$

LIQUIDITY/SHORT TERM SOLVENCY RATIOS

1. Current Ratio:

Ideal 2:1

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

Where, Current Assets = Inventories + Prepaid Expenses + Cash and Bank Balances + Receivables/ Debtors + Accrued Income + Short Term Loans and Advances + Short Term Marketable Investments + Advance Tax + Income Tax Refund Receivable

Current Liabilities = Creditors for Goods and Services + Short Term Loans + Bank Overdraft + Cash Credit + Outstanding Expenses + Provision for Taxation + Proposed Dividend + Unclaimed Dividend + Short Term Provisions + Advances from Customers + Current maturity of long term debts

2. Acid Test/Quick/Liquidity Ratio:

Ideal 1:1

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

Where, Liquid/Quick Assets = Current Assets – Stock – Prepaid Expenses

Alternative Approach:

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

Where, Quick Liabilities = Current Liabilities – Bank Overdraft – Cash Credit from bank & other Short Term Loans

3. Absolute Liquidity/Cash Ratio:

Ideal 0.5:1

$$\text{Absolute Liquidity Ratio} = \frac{\text{Cash Reservoir}}{\text{Current Liabilities}}$$

Where, Cash Reservoir = Cash in Hand and at Bank + Demand Deposits at Bank + Short Term Marketable Investments

4. Defensive Interval/Cash Interval Ratio:

$$\text{Defensive-Interval Ratio} = \frac{\text{Cash Reservoir + Receivables}}{\text{Projected Daily Cash Requirement}}$$

Where, Projected Daily Cash Requirement = (Operating Cash Expenses + Interest + Income Taxes + Dividends)/360

5. Ratio of Inventory to Working Capital:

Ideal 1:1

$$\text{Inventory to Working Capital Ratio} = \frac{\text{Inventory}}{\text{Working Capital}}$$

LONG TERM SOLVENCY RATIOS

1. Debt-Equity Ratio:

Ideal 2:1

Debt-Equity Ratio (D/E Ratio) = $\frac{\text{Debt}}{\text{Equity}}$

OR = $\frac{\text{Long Term Debt Funds}}{\text{Shareholders or Proprietors Funds or Net Worth}}$

Where, Long Term Debt Funds = Long Term Loans (whether Secured or Unsecured), e.g. Debentures, Bonds, Loans from Financial Institutions

2. Debt to Total Funds Ratio/Debt Ratio:

Ideal 2:3

Debt to Total Funds Ratio = $\frac{\text{Debt}}{\text{Total Funds}}$

OR = $\frac{\text{Debt}}{\text{Debt + Equity}}$

Where, Total Funds = Shareholders Funds + Long Term Debt

3. Proprietors Funds to Total Funds Ratio/Equity Ratio:

Ideal 1:3

Equity Ratio = $\frac{\text{Equity}}{\text{Debt + Equity}}$

4. Debt to Total Assets/Debt to Value Ratio:

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

Ideal 2:3

5. Proprietary Ratio:

Ideal 1:3

$$\text{Proprietary Ratio} = \frac{\text{Proprietary Funds/Net Worth}}{\text{Total Assets}}$$

Where, Proprietary Funds / Net Worth = Equity Share Capital + Preference Share Capital + Reserve & Surplus - Fictitious Assets & Losses

6. Gearing or Capital Gearing Ratio:

Ideal < 1

$$\text{Capital Gearing Ratio} = \frac{\text{Pref. Share Capital + Long term Debts}}{\text{Equity Shareholders Funds}}$$

7. Fixed Assets Ratio:

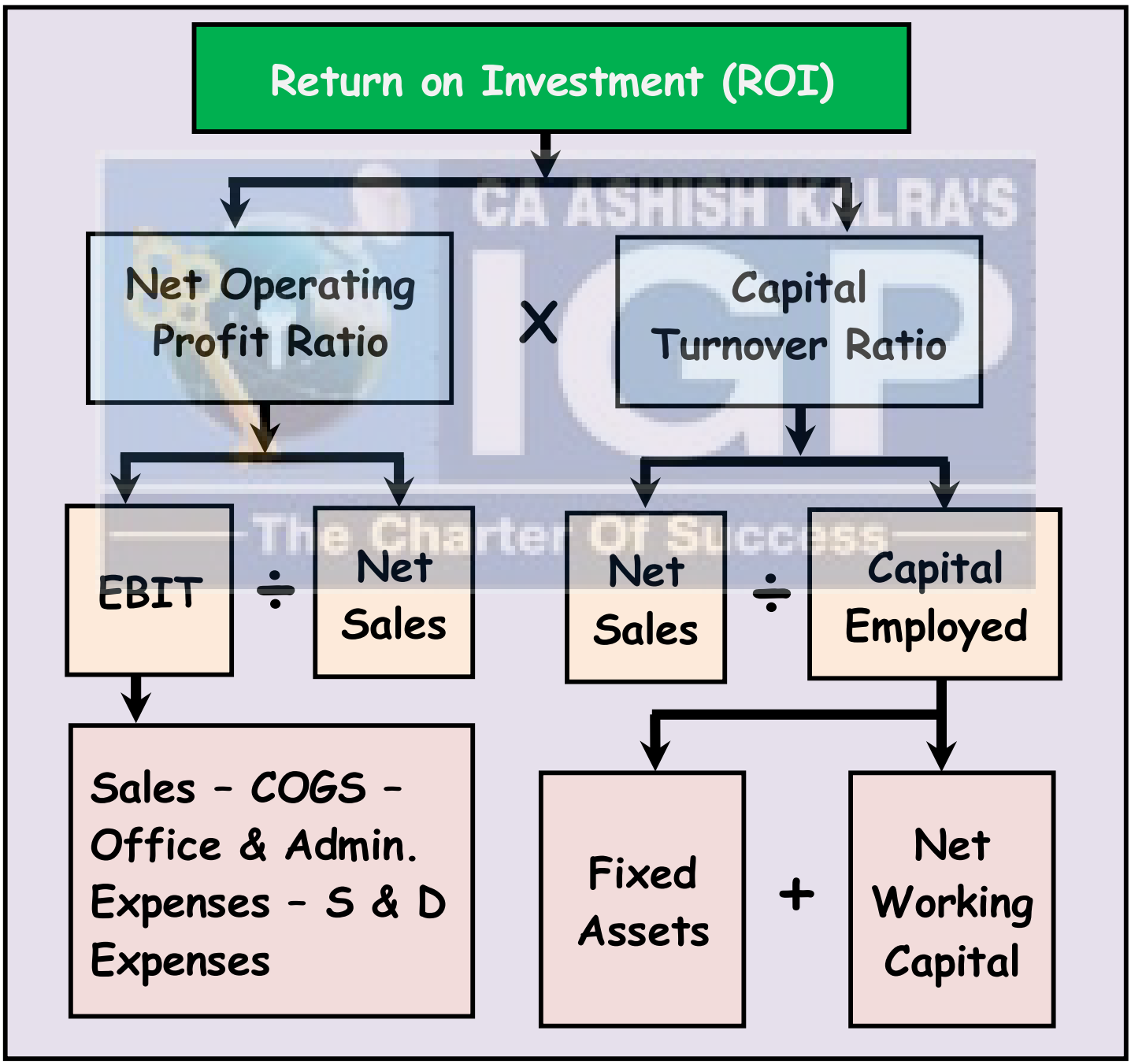
Ideal < 1

$$\text{Fixed Assets Ratio} = \frac{\text{Net Fixed Assets}}{\text{Capital Employed}}$$

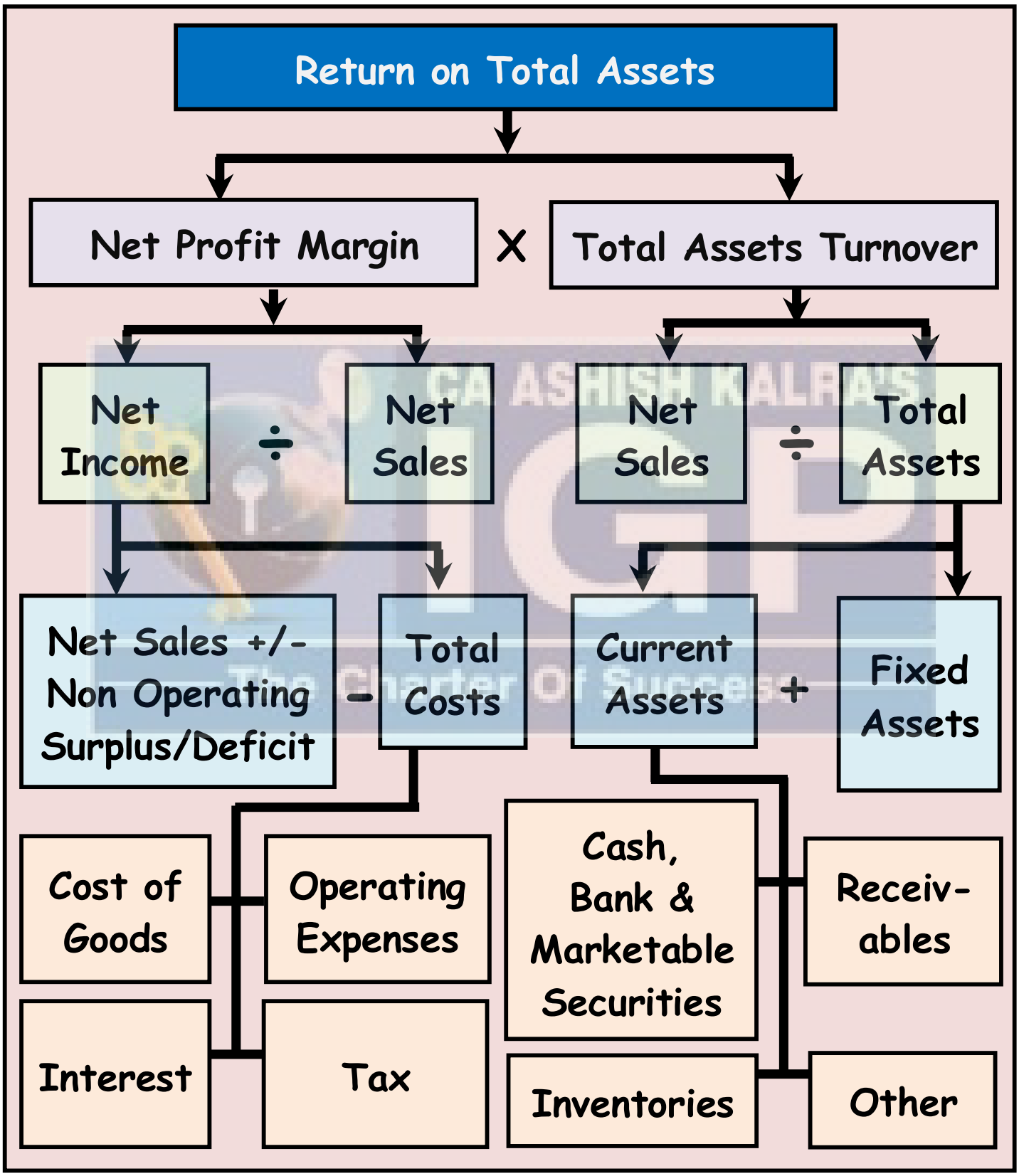
8. Ratio of Current Assets to Fixed Assets:

$$\text{Current Assets to Fixed Assets Ratio} = \frac{\text{Current Assets}}{\text{Net Fixed Assets}}$$

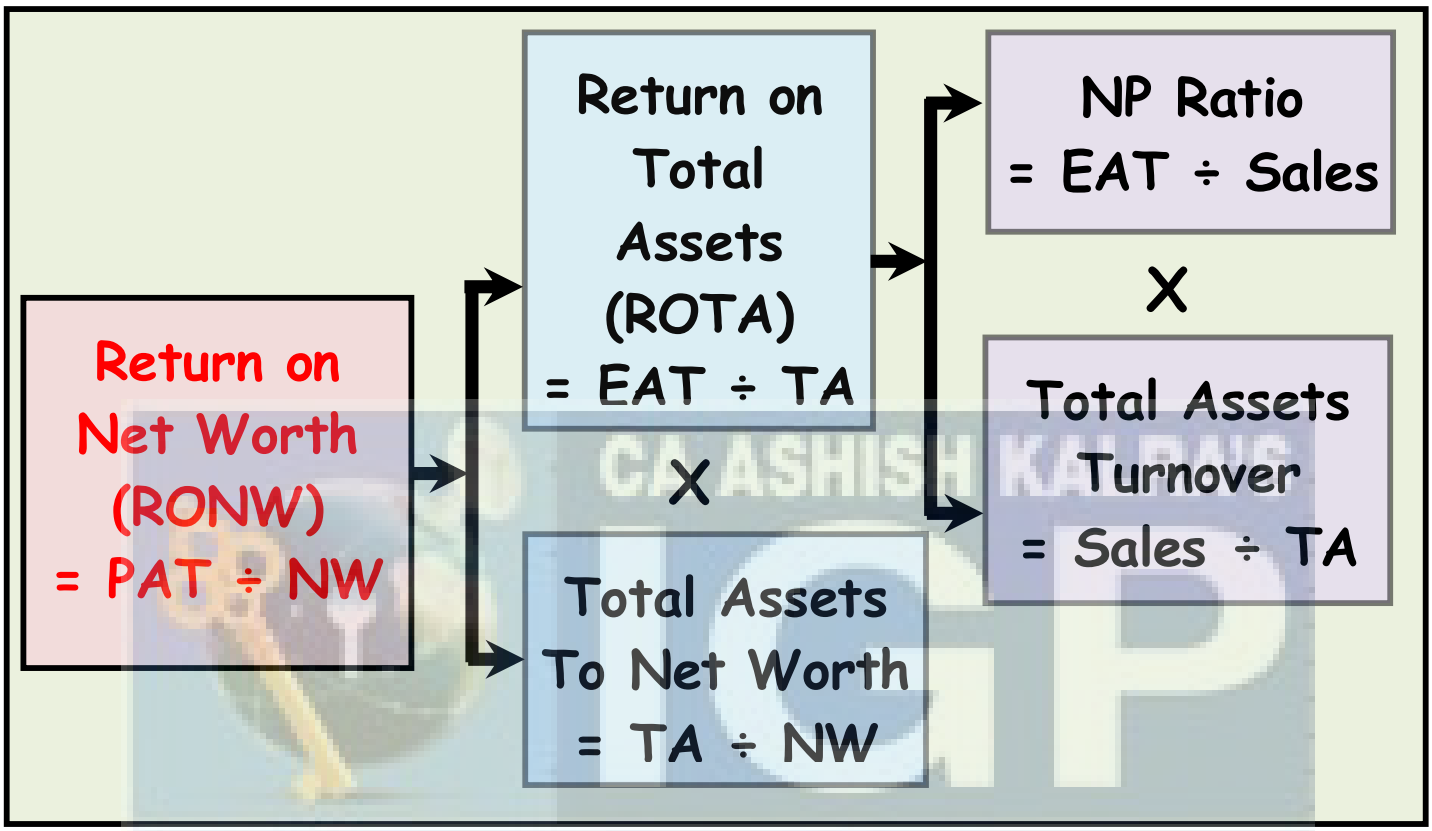
DU-PONT ANALYSIS CHART (ROI)



DU-PONT ANALYSIS CHART (ROTA)



DU-PONT ANALYSIS CHART (RONW OR ROE)



Return on Net Worth	=	Net Profit Ratio	x	Asset Turnover Ratio	x	Equity Multiplier

1. Net Profit Ratio:

$$\text{Net Profit Ratio} = \frac{\text{Profit After Tax}}{\text{Sales}}$$

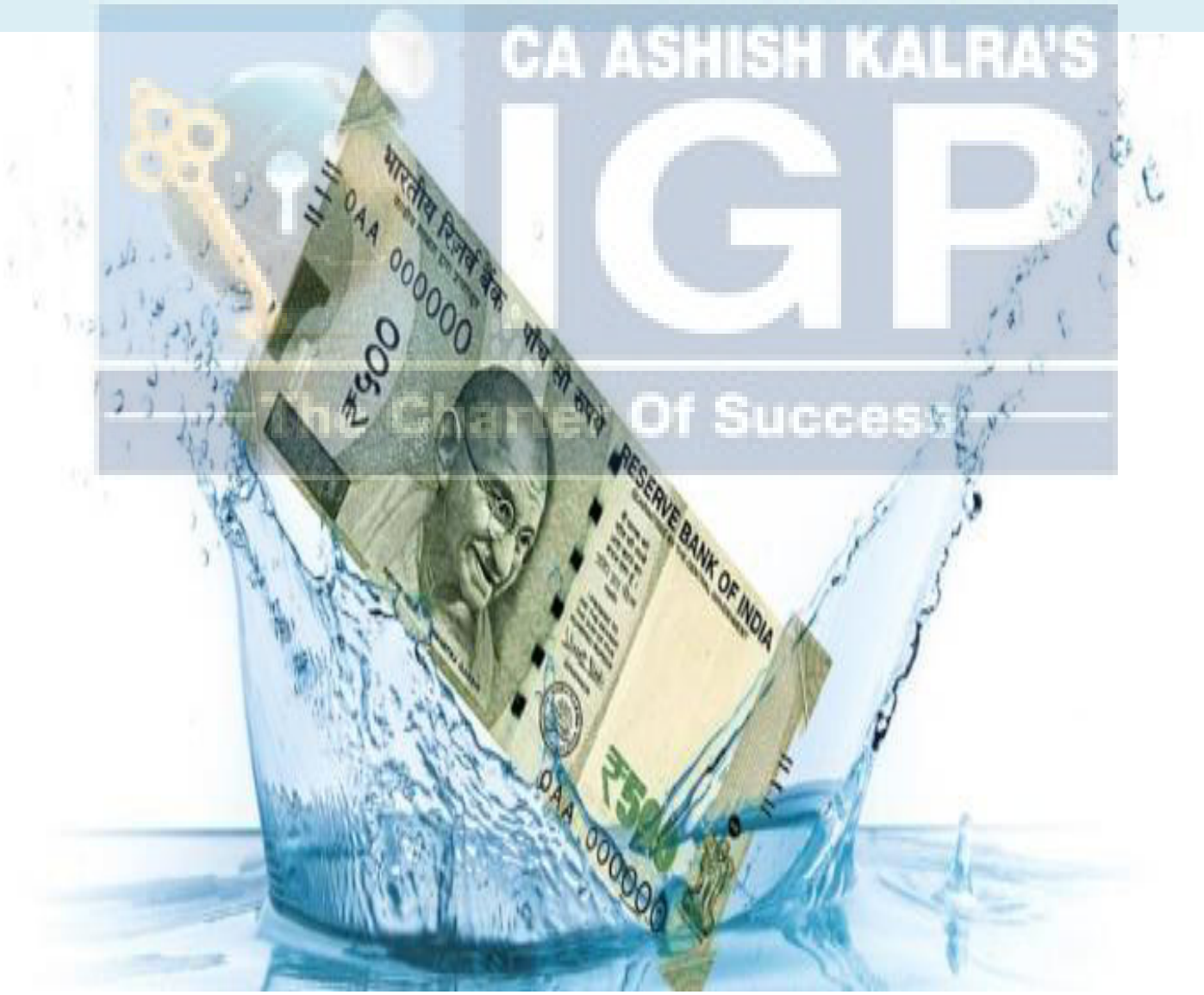
2. Assets Turnover Ratio:

$$\text{Assets Turnover} = \frac{\text{Sales}}{\text{Total Assets}}$$

3. Equity Multiplier:

$$\text{Equity Multiplier} = \frac{\text{Total Assets}}{\text{Shareholder's Equity}}$$

Working Capital Management



GROSS WORKING CAPITAL (GWC)

GWC = Cash in Hand + Cash at Bank + Inventories + Debtors + Bills Receivable + Prepaid Expenses + Short Term Investments + Short Term Loans & Advances

NET WORKING CAPITAL (NWC)

NWC = Current Assets – Current Liabilities

OPERATING CYCLE

Operating Cycle of a Trading Organisation:

Operating Cycle = S + D – C

Where, S = Stock Holding Period

D = Debtors Collection Period

C = Creditors Payment Period

Operating Cycle of Manufacturing Organisation:

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

Where,
R = Raw Material Storage Period
W = Work in Progress Holding Period
F = Finished Goods Storage Period
D = Debtors Collection Period
C = Creditors Payment Period

Number of Operating Cycles p.a. or Operating cycle turnover ratio = $\frac{360 \text{ days}}{\text{Operating cycle period in days}}$

Average Working Capital Requirement or Average Operating Cash required to be introduced for Working Capital Purposes = $\frac{\text{Total Operating Costs (excluding depreciation w/o)}}{\text{Number of Operating Cycles p.a.}}$

Raw Materials Holding Period:

Raw Materials Holding Period = $\frac{\text{Average Stock of Raw Materials}}{\text{Raw Materials Consumed}} \times 360$

Work in Progress Holding Period:

$$\text{WIP Holding Period} = \frac{\text{Average Stock of WIP}}{\text{Net Factory Cost}} \times 360$$

Finished Goods Holding Period:

$$\text{Finished Goods Holding Period} = \frac{\text{Average Stock of Finished Goods}}{\text{Cost of Goods Sold}} \times 360$$

Debtors Collection Period:

$$\text{Debtors Collection Period} = \frac{\text{Average Debtors/Receivables}}{\text{Net Credit Sales}} \times 360$$

Creditors Payment Period:

$$\text{Creditors Payment Period} = \frac{\text{Average Creditors/Payables}}{\text{Net Credit Purchases}} \times 360$$

CASH MANAGEMENT MODELS

1. William J. Baumol's Certainty Model (1952):

$$OTS = \sqrt{\frac{2 \times A \times T}{C}}$$

Where, OTS = Optimum Transfer Size of cash

A = Annual or monthly Cash Disbursements

T = Fixed Costs per transaction

C = Opportunity Cost per rupee p.a. or p.m.

2. MILLER-ORR MODEL/ UNCERTAINTY MODEL (1966):

$$RP = \left(\frac{3b\sigma^2}{4I}\right)^{1/3} + LL$$

Where, RP = Return Point

b = Transaction Cost/ Conversion Cost per transaction or Conversion

σ^2 = Variance of daily change in expected Cash flows or daily change in expected Cash flows

I = Daily Interest Rate

LL = Lower Limit

UL = Upper Limit

UL = 3RP – 2 x LL **OR** = RP + 2 x R

LL = RP – R

Where, **R** = $\left(\frac{3b\sigma^2}{4I}\right)^{1/3}$

WORKING CAPITAL INVESTMENT POLICY

Particulars	Conservative Policy	Moderate/ Matching Policy	Aggressive Policy
Amount of CA	High	Medium	Low
Liquidity	High	Medium	Low
Profitability	Low	Medium	High
Risk	Low	Medium	High

WORKING CAPITAL FINANCING POLICY

Particulars	Conservative Approach	Moderate/ Matching Approach	Aggressive Approach
(1) Short Term Funds /CL	Low	Medium	High
(2) Finance out of Long term Funds	Entire F.A., Permanent C.A., A Part of temporary C.A.	Entire FA & Perman-ent C.A.	Entire F.A. & a part of Permanent C.A.
(3) Finance out of Short term Funds	Part of Temporary C.A.	Entire Tempo-rary C.A.	Entire Temporary C.A. & part of Permanent C.A.
(4) Liquidity	High	Medium	Low
(5) Profitability	Low	Medium	High

(6) Best Performance in	Recession	Normal	Boom
(7) Worst performance in	Boom	N.A.	Recession

BASIC FORMAT OF CASH BUDGET

Particulars	Jan.	Feb.	Mar.
Opening Cash Balance (A)	✓	✓	✓
Receipts:			
Cash Sales	✓	✓	✓
Commission/ Dividend/ Rent/ Interest Received	✓	✓	✓
Cash Received from Debtors	✓	✓	✓
Issue of Shares (Equity/Preference)/ Debentures	✓	✓	✓
Sale of F.A./ Investments	✓	✓	✓
Total (B)	✓	✓	✓

Particulars	Jan.	Feb.	Mar.
Payments:			
Suppliers of Materials	✓	✓	✓
Wages & Salaries	✓	✓	✓
Administration Overheads	✓	✓	✓
Production & S&D Overheads	✓	✓	✓
Purchase of F.A. & Investments	✓	✓	✓
Redemption of Debentures/ Preference Shares	✓	✓	✓
Interest & Dividends Paid	✓	✓	✓
Total (C)	✓	✓	✓
Closing Cash Balance (A)+(B)–(C)	✓	✓	✓

ESTIMATION OF WORKING CAPITAL REQUIREMENT (TOTAL BASIS)

(A) Current Assets:

(I) Inventory of Raw Materials =

$$\left[\text{Raw Materials Consumed} \times \frac{\text{Raw Materials Holding Period}}{12/360/52}\right]$$

(II) Inventory of Work in Progress =

$$\left[\text{Raw Materials Consumed} \times \frac{\text{WIP Holding Period}}{12/360/52} \times \text{Degree of Completion}\right] + \left[\text{Conversion Costs} \times \frac{\text{WIP Holding Period}}{12/360/52} \times \text{Degree of Completion}\right]$$

If DOC is not known, assume DOC : RM = 100% & CC = 50%

(III) Inventory of Finished Goods =

$$\text{Factory COGS} \times \frac{\text{Finished Goods Holding Period}}{12/360/52}$$

(IV) Debtors =

$$\text{Net Credit Sales} \times \frac{\text{Average Collection Period}}{12/360/52}$$

(V) Prepaid Expenses =

$$\text{Expenses for the year} \times \frac{\text{Period of Pre-Payment}}{12/360/52}$$

If DOC is not known, assume DOC: RM = 100% & CC = 50%

(B) Current Liabilities:

(I) Creditors for Purchases of Raw Materials =

$$\text{Net Credit Purchases} \times \frac{\text{Average Payment Period}}{12/360/52}$$

(II) Outstanding Expenses =

$$\text{Expenses for the year} \times \frac{\text{Period of Lag/Delay}}{12/360/52}$$

ESTIMATION OF WORKING CAPITAL REQUIREMENT (CASH COST BASIS)

(I) Inventory of Work in Progress =

$$\left(\text{Raw Materials Consumed} \times \frac{\text{WIP Holding Period}}{12/360/52} \times \text{Degree of Completion}\right)$$

$$\left(\text{Conversion Costs excluding Dep.} \times \frac{\text{WIP Holding Period}}{12/360/52} \times \text{Degree of Completion}\right)$$

(II) Inventory of Finished Goods =

$$\left(\text{Factory COGS excluding Dep.} \times \frac{\text{Finished Goods Holding Period}}{12/360/52}\right)$$

(III) Debtors =

$$\left(\frac{\text{Cash Cost of Net Credit Sales}}{} \times \frac{\text{Average Collection Period}}{12/360/52}\right)$$

ESTIMATION OF ADDITIONAL WORKING CAPITAL REQUIREMENT IN CASE OF DOUBLE SHIFT OPERATIONS

Unless otherwise stated it will be assumed that:

1) Production & Sales (units) will be doubled.
2) Inventory of Raw Material & Finished Goods (in units) will be doubled.
3) Fixed Cost (in total) will remain constant & Variable Cost (per unit) will remain constant.
4) If Credit allowed to customers & credit allowed by suppliers remains constant, then Debtors & creditors (in units) will be doubled.
5) Inventory of WIP (in units) will remain constant.
6) Additional Working Capital requirement will be computed on Cash Cost Basis.

AVERAGE INVESTMENT IN DEBTORS

$$\text{Average Investment in Debtors} = \text{Cost of Net Credit Sales} \times \frac{\text{ACP}}{\text{12 months/360 days/ 52 weeks}}$$

COST OF NET CREDIT SALES

1. **Total Cost Approach:** It considers the total of Fixed Costs & Variable Costs of Credit Sales.
2. **Marginal Cost Approach:** It considers only the Variable Costs & Additional Fixed Costs.

CREDIT POLICIES: LOOSENING OF CREDIT PERIOD

Particulars	Incremental Gains	Incremental Costs
Contribution	Increase	
Collection Costs	Decrease	
Bad Debts		Increase
Opportunity Cost of Investment in Debtors/WC		Increase
Fixed Costs		Increase

CREDIT POLICIES: TIGHTENING OF CREDIT PERIOD

Particulars	Incremental Gains	Incremental Costs
Contribution		Decrease
Collection Costs		Increase
Bad Debts	Decrease	
Opportunity Cost of Investment in Debtors/WC	Decrease	
Fixed Costs	Decrease	

CREDIT POLICIES: CASH DISCOUNT POLICY

Particulars	Incremental Gains	Incremental Costs
Contribution	Increase	
Collection Costs	Decrease	
Bad Debts	Decrease	
Opportunity Cost of Investment in Debtors/WC	Decrease	
Fixed Costs		Increase
Cash Discount		Increase

IMPLICIT ANNUAL INTEREST RATE ON CASH DISCOUNT

Implicit Interest Rate on Cash Discount =

$$\frac{\text{Cash discount on ₹100}}{\text{₹100 – Cash discount on ₹100}} \times \frac{365 / 12}{\text{Period of Prepayment}} \times 100$$

FLOATS

Average funds blocked in Floats = $\frac{\text{Net Credit Sales}}{\text{365/360 Days}} \times \text{Days of Float}$

FACTORING

Annual Savings on account of Factor's Proposal:

Particulars	Amount in (₹)
Annual savings in Administration Charges	xxx
Add: Savings in Bad-Debt Loss (in case of Factoring Service on non-recourse basis)	xxx
Annual Savings (A)	**xxx**

Annual Costs on account of Factor's Proposal:

Particulars	Amount
Interest Charges p.a. Advance by Factor x Interest Rate p.a. to the company	xxx
Add: Factor's Commission p.a.	xxx
Annual Costs (B)	**xxx**
Net Cost p.a. (B) – (A)	**xxx**

Computation of Advance by Factor to the Company:

Particulars	Amount in (₹)
Average Receivables Credit Sales x ACP / 12 /360	xxx
Less: Factoring Reserve	(xxx)
Less: Factoring Commission on average receivables	(xxx)
Advance by Factor to the Company	**xxx**

Effective Cost =

$$\frac{\text{Net Cost}}{\text{Advance by Factor to the Company} - \text{Advance by Factor to the Company} \times \text{Interest Rate p.a.} \times \frac{\text{ACP}}{12/360}}$$

MAXIMUM PERMISSIBLE BANK FINANCE (MPBF) - TANDON COMMITTEE: LENDING NORMS

Norm No. I

Current Assets	✓
Less: Current Liabilities (other than MBPF)	(✓)
Net Working Capital	✓
Less: 25% thereof	(✓)
MPBF	✓

Norm No. II

Current Assets	✓
Less: 25% thereof	(✓)
75% of Current Assets	✓
Less: Current Liabilities (other than MBPF)	(✓)
MPBF	✓

Norm No. III

Current Assets	✓
Less: Hard-Core Current Assets	(✓)
Soft-Core Current Assets	✓
Less: 25% of thereof	(✓)
75% of Soft-Core Current Assets	✓
Less: Current Liabilities (other than MBPF)	(✓)
MBPF	✓

Computation of Current Ratio (CR) after Computing MPBF with:

(1) Estimated Current Assets & Current Liabilities:

$$CR = \frac{\text{Estimated Current Assets}}{\text{Estimated Other Current Liabilities + MPBF}}$$

(2) Actual Current Assets & Current Liabilities:

$$CR = \frac{\text{Actual Current Assets + Cash receivable from MPBF}}{\text{Actual Current Liabilities + MPBF}}$$

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