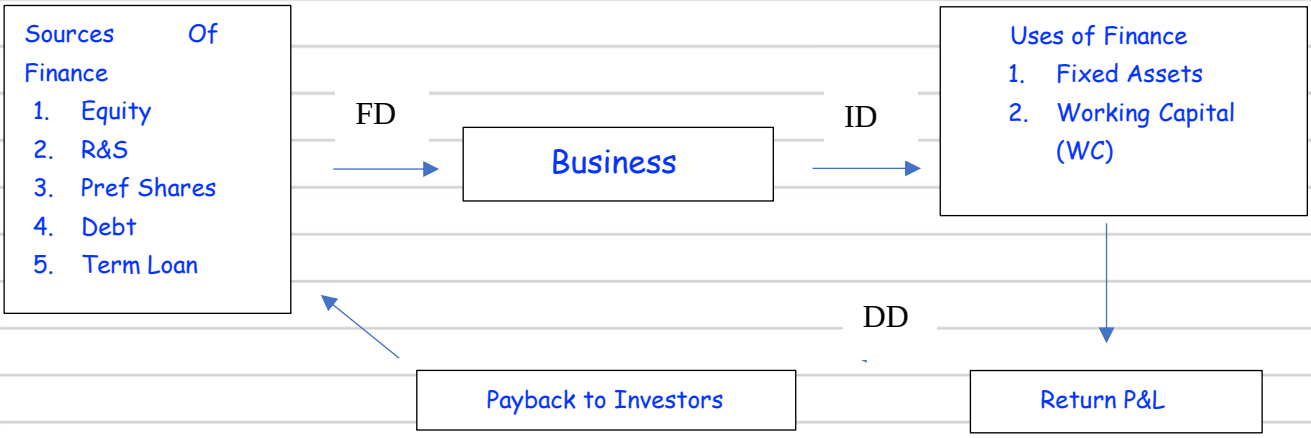
Base Building



Types Of financial decisions by financial managers

Types	Financing decision (FD)	Investment decisions (ID)	Dividend decisions (DD)
Meaning	Paisa kaha se laaye?	Kaha aur kitna invest karein ?	Kitna save karoge aur kitna baantoge?
Areas	Sources of finance Cost of Capital Capital Structure	FA → NCA Capital Budgeting	Dividend Payout Ratio
Finance	Procurement	Utilization	Utilization

Balance sheet (BS) & profit and Loss (PL)

Equity & Liabilities	Assets
Net Worth NCL CL	NCA CA

PAT for the year → Split up (Part of DD)

a. Dividend payout → Cash outflow

b. R&S into BS → Invested in business

Net Worth / Proprietor funds /
Book value of equity / Shareholder funds = Eq Sh + R&S + Pref sh
Capital Employed (CE) / Capital Structure = Net Worth + NCL like Debt
Financial Structure = All financial resources → CE + CL

- Objective of Business – Take financial decisions → Wealth Maximization → Increasing Equity Sh. Wealth → Increase share price → Happy shareholders! Hurray!!

While making any financial decision, Think of

- Impact on Financial numbers → Financial statements – BS, P&L & CF
- Risk and return balance → Risk Management
- Non- Financial factors example Goodwill and Image
- Wealth Maximization → increase CMP of shares → Market Capital increases

Notes

- Who owns the company → Equity Sh
- Who makes decisions of the company → Management
- Because of control by Sh and mgt decisions, agency problem arises which leads to agency costs
- Agency Problem → Management (Agents) may think and take decisions for their personal benefit rather than in the interest of Sh

A brief comparison of Equity vs Debt

Considerations	Equity	Debt
Control	Yes	No, unless insolvency
Cost of Co.	high	low
Risk of Co.	Low	high
Return/ cost expectation	high	low
Risk of investors	high	Low

Objectives of FM → Management guide to Decision Making

Methodology	Profit maximisation PM	Wealth maximisation WM
Perspective	Short term view	Long term view
Target	P&L perspective	Cash flow approach
Focus	Book profits	Shareholders return
Return	high	High but Considers risk
Risk	Ignores	Adequate

- WM takes into account the risk and returns along with timing of cash flows (TVM)
- However, WM does not offer any clear relationship between financial decisions and CMP

Base Building

- CoC generally calculated from Company's perspective.
- Yield is the return earned/expected by the investors on their investment
- CoC ≠ Yield in some cases because of factors like

	Company (Cost)		Investor (Yield)
Tax Shield	Post-Tax	<	Pre-Tax
Floatation costs	Net Proceeds	>	Gross Investment

CoC is used in (Significance)

- FD → Selection of Source of capital - cheaper source
- ID → Capital Budgeting - compared to ROI & Performance Appraisal of projects
- DD → Whether to retain or give dividends to Shareholders
- WCM → CoC as cost for WC for designing optimum credit policy
- Cost of Capital (CoC) is also known as Cut off Rate, Hurdle Rate.

Thumb rule to calculate CoC = $\frac{\text{Net Cash Outflow after tax (CO)}}{\text{Cash Inflow (CI)}} \times 100$

Interest (Coupon Rate) = Always calculated on Face Value of instrument for Interest payout

Flotation cost = Costs incurred to float Fresh capital in primary market

If given in %, calculate on Issue Price / CMP (silent Q - updated)

NP → Net Proceeds = Issue Price/CMP – floatation costs

RV → Redeemable Value*

CMP → Current Market Price (Take ex-dividend price)

Issue Price → Price at which new securities are issued. Assume = CMP if silent

FV → Base/Face value of instrument → use for int calculation (not on NP/CMP)

PD → Pref dividend

*For RV → Think from debt/Pref holder Point of View

If convertible debt → choose option which provide more value to debt holder between equity redemption or debt redemption

If ques is silent → RV = face value

Major Components of Capital

- Debentures / Debt / Term Loan → Cost of Debt → Kd
- Pref. Shares → Cost of Pref Share Cap → Kp
- Eq. Shares → Cost of Eq Share Cap → Ke
- Retained Earnings (RE) → Cost of RE → Kre

Cost of Debt → Kd

Debenture	Method	Formula to calculate Kd
Irredeemable Debt (Assume if Q silent)	Thumb Rule	$\frac{\text{Int (1- T)}}{\text{NP}} \times 100$
Redeemable - Lumpsum	Approximation Method (Short-cut)	
	1. RV = NP (life not relevant)	$\frac{\text{Int (1- T)}}{\text{NP}} \times 100$
	2. RV ≠ NP → Capital portion taxable	$\frac{\text{(Int + } \frac{\text{RV - NP}}{\text{n}}\text{) x (1-T)}}{\frac{\text{RV + NP}}{2}}$
	3. RV ≠ NP → Capital portion not taxable (Assume if silent Q)	$\frac{\text{Int (1-T) + } \frac{\text{RV - NP}}{\text{n}}}{\frac{\text{RV + NP}}{2}}$
	YTM Method (IRR)	Hit and Trial Method Interpolation
Redeemable - Instalments Or Floating Rate Bonds	YTM Method (IRR)	Hit and Trial Method Interpolation
Zero-coupon Bonds (ZCB)	Compounding	$PV\ (1+r)^n = FV$

Cost of Pref Share capital → Kp

Type of pref.	Method Name	Formula to calculate Kp
Irredeemable pref.	Thumb Rule	$\frac{PD}{NP} \times 100$
Redeemable - Lumpsum	Approximation Method (Short-cut)	
	1. RV = NP (life not relevant)	$\frac{PD}{NP} \times 100$
	2. RV ≠ NP →	$\frac{PD + \frac{RV - NP}{n}}{\frac{RV + NP}{2}} \times 100$
	YTM Method (IRR)	Hit and Trial Method Interpolation
Redeemable - Instalments	YTM Method (IRR)	Hit and Trial Method Interpolation

Cost of Equity share capital → Ke

Method name	Formula to calculate Ke
Dividend Price Approach (no growth case)	$\frac{D}{Po^*} \times 100$
Earning Price Approach (no growth case)	$\frac{EPS}{Po^*} \times 100$
Growth approach model Gordon's Model	$\frac{D_1}{Po^*} + g$
Realized Yield Approach	Actual IRR rate earned on shares in past (past performance is used as a benchmark and taken as expected Ke in future as well)
CAPM (risk-adjusted Ke)	Rf + β (Rm – Rf)
PE Reciprocal (Last resort)	1 / PE Ratio

*Take NP instead of Po in case of new issue

- Rf → risk-free return Rm → return of Market
- β (Rm – Rf) → additional return due to risk taken over Rf
- β → Multiplier (Risk measure) → Risk effect of share/security compared to market risk
- Rm – Rf → Market / Equity Risk Premium → Extra return generated by market over R
- Do → paid, current, existing, reported, pays (or silent Dividend)
- D_1 → next, next year expected (ICAI – Nov 19 Q5 – Net Expected D is Rs 2 = Do)
  TYK Q6 Ch 8 – Expected to pay D = Do
  TYK Q7 Ch 8 – Expected Dividend = D_1
- If EPS and DPR are given in Q (silent) – ICAI generally assumes EPS x DPR = D_1
  Q11 TYK – EPS x DPR → ICAI assumed to be Do

Cost of Retained Earnings (Kre)

- It is also known as internal equity, Calculation is similar to Ke
- Ignore flotation costs for Kre – for Po calculation
- Take CMP (not issue price) here for NP calculation (if specific question) → Correct
- Take Issue Price (not CMP) here for NP calculation (if WACC question) → ICAI Q5 TYK
- If personal tax is given → Tax is saved by shareholders because of retention of dividend
  Kre = Ke (1-Tp)
- If flotation cost is also given (reduction in cost of RE) → Kre = Ke (1-Tp) (1-f)

Calculation of growth (g) → sustainable growth rate of Dividend

Method name	When to use	Formula to calculate g
Average CAGR method	Do and dividend n years ago is given	Dividend n years ago x $(1 + g)^n$ = Do
Gordon's growth model	Retention ratio and ROI is given	g = b x r b = Retention Ratio = 1-DPR r = ROI % (given), else, EPS/BVPS
Realized yield approach	Historical Dividend, Purchase and sale price is given	Actual IRR rate historically earned on shares using dividends each year, initial investment and final sale price
Geometric Mean approach	Historical Dividend, share price of all years is given	Step 1 – Calculate total yield* of each year Step 2 - Calculate Geometric mean of all individual returns (CAGR type calc.) $(1+R_1) \times (1+R_2) = (1+g)^2$

*Explanation of Yield

- Dividend yield → Dividend income in % of investment = $\frac{D1}{} \times 100$

Po

- Capital Gain yield → Increase in capital in % of investment = $\frac{(P_1 - P_0)}{P_0} \times 100$
- Total yield → Total increase in wealth as a % of investment = $\frac{D1 + (P_1 - P_0)}{P_0} \times 100$
- Earnings yield → EPS in % of investment = $\frac{EPS}{P_0} \times 100$

If Q specifies growth rates of Sales ≠ g of Dividend. (g = b x r)

IRR method – Interpolation (Hit & Trial Method)

1. LR — IRR rate — 4. HR

2. NPV + — 0 NPV — 3. NPV –

$$IRR = LR + \{ \frac{NPV\ LR}{NPV\ LR - NPV\ HR} \times (HR - LR) \}$$

- If PVF table rates given in Q, use them. If not,
- Start with 10% rate NPV. See if +ve or -ve NPV. Choose second rate accordingly. (3 decimal points)
- Make sure NPV is -ve at one rate and +ve at another
- 5 % difference between LR & HR is acceptable

Weighted average cost of capital (WACC)

Co. uses and raise capital from multiple sources and in different proportions → capital structure

- Each source has it's own cost as studied earlier.
- Here we will calculate WACC → average total cost of capital by calculating weighted average
- Ignore floatation costs and take Ex-dividend price for Market Value calculations for WACC/MACC

Method name	Book values	Market Values
Equity Sh Cap	Book Value	No. of Shares x CMP
R & S	Book Value	
Pref share cap	Book Value	No. of shares x CMP
Debt	Book Value	No. of Debt x CMP
Term Loan	Book Value	Book Value (it remains same)
	Total	Total

Take Ex-dividend / Ex-interest price for market value weights

- Book Value of Equity Sh. = Eq Sh Cap + R&S
- Shareholder Funds = Eq Sh Cap + R&S + Pref Cap
- Capital Employed / Net Assets = Eq Sh Cap + R&S + Pref Cap + Debt
- If Q specifies a method to take weights → use it
- Silent Q → If Market values are given, Use Market value weights else BV weights
- If Ke and Kre are separately given, split Market Value Weights of Equity between Eq sh cap and R&S in their book value proportion.

Exam solution

Capital structure	Capital	Weights	CoC	Weighted Cost
Equity Share cap	Value		Ke	
Pref share cap	Value		Kp	
Debt	Value		Kd	
	Total			Total

Marginal cost of capital (MACC)

- Cost for New/ additional/ fresh capital raised
- For weights → only take marginal capital structure or target/optimum CS
- Use existing weights for MACC if new marginal weights are not given
- For CoC → take cost of fresh issue used in marginal capital
- Use existing CoC for some sources if new marginal CoC is not given
- Sometimes, CoC can vary acc. to size / weights in Capital Structure (Risk adjusted) →

a. Can calculate CoC separately as per slabs* and also weight them separately

b. Can calculate weighted average cost of capital separately for debt = $\frac{\text{Total Int (Post tax)}}{\text{Total Debt}}$

Eg Debt upto 2 lakh @ 8%. Debt > 2 Lakh = 10%

- *Slabs – Generally consider it as slabs, but if Ke is also given slab wise, then assume Ke & Kd also → cumulative total Cost and not slab wise (RTP Nov 18 Q2)

Base building (Objective)

- Have Optimal/Target capital structure → so that, Value of firm (Vf) increases.
- How much weights → equity, preference, debt, Term Loan →
  depends on sources, Amount, Cost, Risk, Control, tax benefits
- Kd < Ke → take more debt but if Debt is very high compared to equity → DFL high, risk high
- Trading on equity → double-edged sword in case profit falls
- Mix of debt and equity → optimum → Vf high, WACC low, Risk adequate
- Value of equity (S) + value of debt (B) = value of firm Vf (prefer market value)
- If all other is constant inc. risk, if WACC is low → Value of firm will increase

Theories of Capital Structure (CS)

Relevance Theory	Irrelevance theory	Others Theories	Impact	Optimum CS
CS impacts WACC & Vf	No impact of CS on WACC & Vf	No Prac. Q		
Net Income (NI)			Ke & Kd → Same WACC → Changes	100% (High) debt
	Net Op. Inc (NOI)		Kd & WACC → same Ke →changes	Any proportion
Traditional			Ke & Kd → Changes WACC → Changes	Min. WACC combo
	MM Model (Without Tax)		Kd & WACC → same Ke →changes	Any proportion
MM Model (with tax)			Vf Lev. = Vf unlev + tax shield on debt	
		Trade-off		
		Pecking Order		

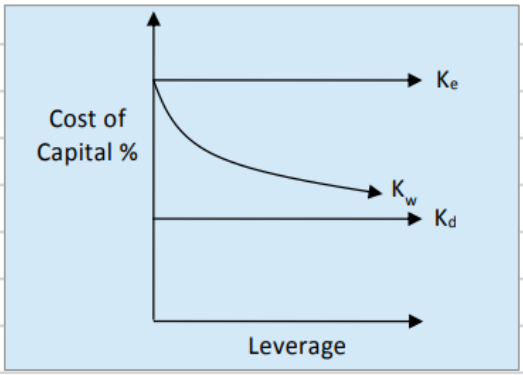
Model Assumptions

- No Tax → NI, NOI, Traditional, MM (Without Tax)
- Tax → MM (With Tax)
- DPR → 100% → No RE → No growth
- No Transaction or other costs
- ICAI ji → Can give tax in NI, NOI & traditional – take it if given

NI approach → Dheeth/Stubborn

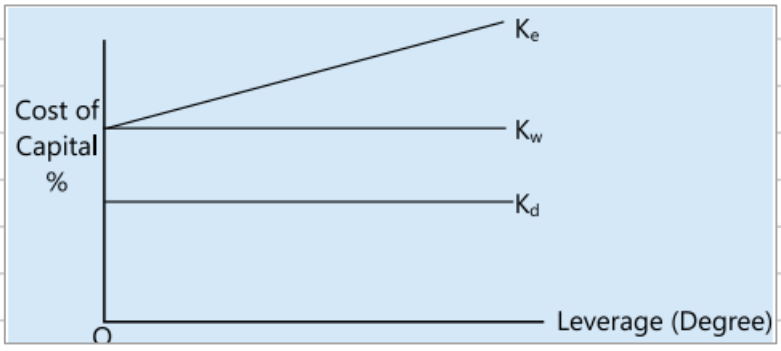
- Whatever CS is proportion of debt and equity → Ke & Kd remain the same
- Weight of debt (leverage) increases → WACC reduces → Vf increases
- Optimal CS = 100% debt (illogical) → Practically - more to more debt in CS
- Remember CoC → Ke = $\frac{EPS}{Po}$
- Here, Value of Equity (S) = $\frac{PAT}{Ke \text{ / Capitalization rate}}$
- Value of debt (B) → given in question. Else, Units x Face Value / CMP
- Value of Firm (Vf) = $\frac{EBIT}{WACC}$ Else, Vf = S + B

WACC = Weighted average CoC or EBIT / Vf



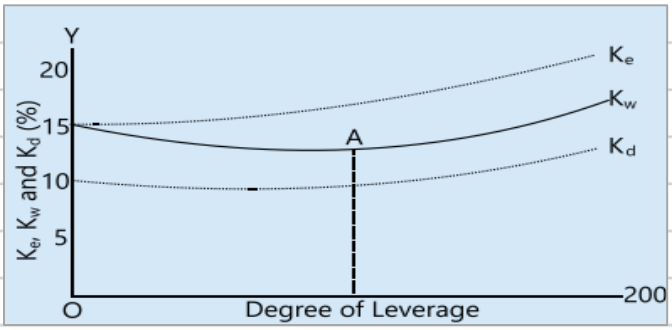
NOI approach → (Rope Tug-off war - Tie)

- Whatever CS is the proportion of debt and equity → Kd & WACC remain the same
- WACC = (Kd x Wd) + (Ke x We)
- Force 1 → If debt increases → Wd increases → WACC reduces (Kd < Ke)
- Force 2 → If Ke increases because of high DFL, Ke x We also increases → WACC increases
- Impracticable → both forces cancel each other → WACC is same as before



Traditional approach → Realistic. Sab kuch change hoga, badlav ayega

- If debt increases upto an extent - Kd → Same, Ke → same or increase (acceptable DFL)
- If debt is very high – Kd & Ke → increases (high DFL, high financial risk)
- Then, WACC also starts in increasing
- Optimal CS = minimum WACC in combination (Hit & Trial)



Exam Solution

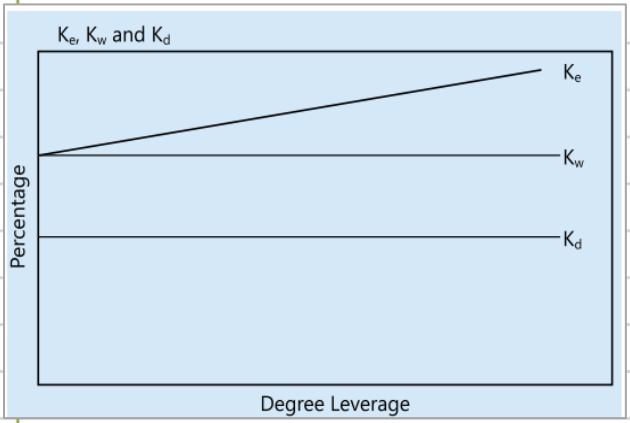
Particulars	Sub-heads	Alternative 1 - CS	Alternative 2 - CS	Notes
No. of Equity Sh	Existing			Per Existing capital
	New Issue			New eq issue / issue price
	Total			
Debt	Existing			Per Existing capital
	New Issue			If Q provides
	Total			
EBIT	Existing			Given in Q
	New Project			Given. Else assume current ROI (Current EBIT/Current MV of CE) applies to fresh CE as well
	Total			
(-) Interest on debt	Total			Based on each alternative
PBT				
(-) Tax				
PAT				Adj. Pref Div if given in Q
÷ No. of Eq sh	Total			Based on each alternative
EPS				If Q asks to decide on Max EPS
x PE Ratio				PE may differ as per the CS
MPS				Q asks to decide on Max MPS

MM approach without tax (1958) – Same as NOI

- Similar to NOI approach, but, provided justification via arbitrage
- WACC → related to CoC for whole capital/business CS
- Business Risk → relates to whole business where we operate, not how capital is raised
- Vf → depends on EBIT and business risk, not on CS

Assumptions →theory ques = short note

- Capital markets are perfect
- Rational investors → risk averse
- No taxes, No transaction costs
- Personal leverage and corporate leverage are substitutable
- Firms can be grouped based on business risk rather than CS. WACC is same across these firms



Arbitrage

- Riskless profit-earning opportunity
- Wow! But how? → Identical/same asset (Vf) in two different markets/choices (2 Co.)
- Buy Cheap – Undervalued → Lower Vf
- Sell Costly – Overvalued → Higher Vf

	Income Increase Approach	Capital Saving Approach
Meaning	Invest all sale proceeds →increase in absolute income	Invest only required amount to keep % ownership same →savings in capital
Case	Levered (Overvalued) to Unlevered (Undervalued)	
St 1	Sell x%* of overvalued firm	Sell x% of overvalued firm
St 2	Borrow x% debt of levered firm (substitute leverage with personal Lev)	Borrow x% debt of levered firm (substitute leverage with personal Lev)

St 3	Invest both above in undervalued firm → increase in ownership % in undervalued	Invest amount required to buy x% in undervalued firm
St 4	Riskless Profit = Increase in income now with same capital investment	Riskless Profit = Reduction in investment now with same income earned*

- *x% given in Q – ok, else may assume 10%
- Calculation of increase in income

a. Before Arbitrage = x% of overvalued co. Income = Rs 100

b. After Arbitrage = Increased ownership of undervalued co. income = Rs 130
(-) Interest on borrowings = (Rs 10)
Net Income = Rs 120

c. Arbitrage Profit = After arbitrage income- Before Arbitrage income = Rs 20

- Because of this continuous arbitrage activity, equilibrium will be achieved until value equates because of demand and supply forces
- Now value of levered firm (S+B) = Value of unlevered firm (S)
- Hence proved → Vf remains same irrespective of CS

	Income Increase Approach	Capital Saving Approach
Case	Unlevered (Overvalued) to Levered (Undervalued)	
St 1	Sell x%* of overvalued firm	Sell x% of overvalued firm
St 2	Invest 50% of sale in debt of levered firm	Invest x% debt of levered firm
St 3	Invest 50% of sale in equity of undervalued firm	Invest amount required to buy x% in undervalued firm
St 4	Riskless Profit = Increase in income now with same capital investment	Riskless Profit = Reduction in investment now with same income earned*

MM approach with tax (1963)

- If tax is there → tax shield on interest is applicable
- Kd will reduce → WACC will reduce → Vf will increase
- Therefore, Value of levered co. (V_L) > value on unlevered co. (V_{UL})

$V_L = V_{UL}$ + tax saving on debt

$V_L = V_{uL}$ + (Debt x tax rate)

Exam ques → value of levered firm with MM model

Step 1. Assume given firm is an unlevered firm → $V_{uL} = \frac{EBIT\ (1 - tax)}{WACC_{UL} \text{ / } Ke_{UL}}$

Step 2. $V_L = V_{uL}$ + (Levered debt x tax)

Step 3. $WACC_L$ = EBIT (1 -tax) / V_L or Weighted Average CoC

Step 4. Ke levered = PAT / Value of equity (S) = (S → VL -B)

- Tax shield (Debt x tax rate) → PV of perpetual tax shield

Exam ques

Two firms	One firm
Levered → find Vf of levered	Currently → unlevered
Unlevered → find Vf of unlevered	Plans to go → levered – Find Vf

Pecking order theory

- CS depends on the manager's choice
- There is information asymmetry, Co. managers know more than market investors
- Manager issues capital in way that they need to reveal minimum info
- If ROI > Kd → positive business environment → debt
- If doubtful → equity
- However, CoC → Kd < Kre < Ke

Source	Order of finance	Why
RE	1	Internal source, reveal min info
debt	2	Cheaper than equity
Equity shares	3	Last resort

Trade-off theory

- $V_L = V_{UL}$ + benefit of debt – Costs of debt
- $V_L = V_{UL}$ + tax advantage on debt – PV of expected bankruptcy & agency cost
- Find a trade-off point at which both are better → cost less and benefit more

Concepts of Capitalization

Under capitalisation	Over capitalisation
Less than required capital	More than the required capital
Current earnings are more than can be earned by existing capital	Earnings less Cost of capital high → Loss to investors

Capital Structure in the practical world → EBIT – EPS – MPS analysis

- If ROI > Kd →Use more debt (DFL) → Increases EBIT, EBT, PAT, EPS → MPS increases → WM
- If ROI < Kd → Use equity
- If ROI = Kd → Indifferent
- Prefer Debt over Pf shares because of tax shield

- ROI → $\frac{\text{EBIT}}{\text{Capital Employed (CE)}} \times 100$
- ROE → $\frac{\text{Earnings for Equity}}{\text{Eq Sh funds}} \times 100$
- ROI Unlevered → $\frac{\text{EBIT (1 – Tax)}}{\text{Capital Employed}} \times 100$ or ROE = ROI (1-Tax)
- MPS/CMP → EPS x PE Ratio — If PE constant, focus on increasing EPS

Exam ques

a. Hit & Trial → Calculate MPS = EPS x PE Ratio. Compare MPS and choose the highest MPS
b. Indifference Point → Level of EBIT at which EPS is same in both alternatives

$$\text{Alt 1 EPS} = \text{Alt 2 EPS}$$

$$\frac{((EBIT-I)(1-T)) - PD}{\text{No. of Sh 1}} = \frac{((EBIT-I)(1-T)) - PD}{\text{No. of Sh 2}}$$

If Projected EBIT > Indifference EBIT as above → Good Business → Use DFL – Debt (fixed cap)
If Projected EBIT < Indifference EBIT as above → Poor business → no DFL - Use Equity

We can also calc. indifference EPS if we put the indifference EBIT in the above formula

Base Building

- Meaning of Leverage – Influence or Power
- Use of some fixed component in P& L.
- Why? So that if variable component increases, overall profit increases in a greater proportion because of presence of some fixed cost component.

Types Of Leverages > expressed in times

Types of Leverages	Operating Leverage (DOL)	Financial Leverage (DFL)	Combined Leverage (DCL)
Relates to	Operating Fixed Cost	Fixed Sources of Capital i.e. Debt & Pref Shares	Operating Fixed Cost & Fixed Sources of Capital
Risk involved	Business Risk	Financial Risk	Total Risk
Interpretation	% Δ in EBIT because of % Δ in Sales	% Δ in EPS because of % Δ in EBIT	% Δ in EPS because of % Δ in Sales
Only One Scenario is given – No Pref shares	$\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{\text{EBIT}}{\text{EBT}}$	$\frac{\text{Contribution}}{\text{EBT}}$
Only One Scenario is given – With Pref shares	$\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{\text{EBIT}}{\text{EBT} - \frac{\text{PD}}{(1-T)}}$	$\frac{\text{Contribution}}{\text{EBT} - \frac{\text{PD}}{(1-T)}}$
Two Scenarios are given	$\frac{\%\ \Delta \text{ in EBIT}}{\%\ \Delta \text{ in Sales}}$	$\frac{\%\ \Delta \text{ in EPS}}{\%\ \Delta \text{ in EBIT}}$	$\frac{\%\ \Delta \text{ in EPS}}{\%\ \Delta \text{ in Sales}}$
Other	$\frac{1}{\text{MOS}}$		
Relationship	DOL x DFL = DCL		

Analysis of P & L statement – Imp for exams → Create PL statement for all leverage Q

Sales	XX
(-) Variable Cost	(xx)
Contribution	XX
(-) Op. Fixed Cost	(xx)
EBIT/ Op. profit	XX
(-) Interest	(xx)
EBT	XX
(Tax)	(xx)
PAT	XX
(-) PD	(xx)
Earnings for Equity	XX
÷ No. of Eq Shares	(xx)
EPS	xx
x P/E ratio	xx
MPS	xx

PV Ratio = $\frac{\text{Contribution}}{\text{Sales}}$

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

DFL = $\frac{\text{EBIT}}{\text{EBT} - \frac{\text{PD}}{(1-T)}}$

DCL = DOL x DFL

T = tax

PD = preference dividend

FC = fixed cost

Int = interest

Notes

- Leverage is different at different points of Sales/P&L
- ICAI → Company with lower DOL, DFL, DCL is better (Lower Risk)
- In ques, if MOS is given, we can calculate DOL. DOL is reciprocal of MOS
- If DFL & Debt is given in ques, there may be some other hidden interest as well
- If questions ask us to solve DFL, don't use it to calculate any hidden interest
- If 25 % Change in sale will wipe out EPS/ EPS = 0 → Change in EPS = 100%, DCL = 4
- DOL, DFL & DCL are used as measures of risk in some questions
- Asset Turnover Ratio = Sales / Total Assets

- % Δ change in EBIT = $\frac{\text{New} - \text{Old}}{\text{Original EBIT}}$ and so on

Break Even Point (BEP)

- No Profit, No loss situation
- Bhagwan chahe profit na ho, but loss bhi na ho!

Types of BEP	Operating BEP – Operational Dept.	Financial BEP – Finance Dept.
Meaning	Level of Sales at which Zero Operating Profit	Level of EBIT at which Zero Profit after Financial Cost
BEP Point	Zero EBIT	Zero EPS
Formula	Sales units = FC / Contri/unit Sales amt = fixed cost / PV ratio Or Sales units x Price	EBIT = Int + PD / (1-T)

Combined BEP = FC + Int + PD / (1 -T) / PV ratio

Level of Sales at which EPS is zero

Bifurcation of P& L - Sales	
Total Sales	
BEP sales	MOS Sales
Sales to generate zero profit	Other remaining sales
Sales to Recover Costs	Profit generating sales

BEP Sales + MOS Sales = Total Sales.

MOS Sales in units = EBIT / Contribution

MOS Sales in Amount = EBIT / PV Ratio

MOS = 1 / DOL

- Calculate BEP and MOS sales in Units, Amount, and in % of total sales

Analysis of leverages

Operating Leverage

IF FC ↑ DOL ↑ operating BEP ↑

IF FC ↓ DOL ↓ operating BEP ↓

IF FC = 0 DOL =0 operating BEP = 0

+ DOL = Sales > Operating BEP → + EBIT
- DOL = Sales < Operating BEP → - EBIT
∞ DOL = Sales = Operating BEP → 0 EBIT

Financial Leverage

IF > FC ↑ DFL ↑ financial BEP ↑

IF > FC ↓ DFL ↓ financial BEP ↓

IF > FC = 0 DFL =0 financial BEP = 0

+ DFL = EBIT > financial BEP → + EPS
- DFL = EBIT < financial BEP → - EPS
∞ DFL = EBIT = financial BEP → 0 EPS

Note:

- High DOL leads to higher risk (Higher Beta – ICAI)
- DOL & DFL can never be between 0 & 1
- If ROCE > Interest on Debt → Favourable DFL

Trading on Equity

- Raising fixed source of finance i.e. debt with equity as the base to have a multiplier effect on the EPS or shareholder's profits → DFL.
- High DFL > Debt high compared to equity

If ROCE > Kd → Wealth Maximisation (WM) profit to equity

However,

If ROCE < Kd → loss to equity shareholders → risk

Therefore, leverage is a double-edged sword

Base Building

- Relates to NCA of BS → Long-term impact on business → Helps achieve vision and mission
- Objective → Maximize wealth of company and shareholders (WM)
- Relates to future periods which are difficult to predict → Influences growth of firm

Process of selection of projects

- Planning → identify investment opportunities
- Evaluate → pros and cons
- Selection → risk and return consideration → wealth maximization
- Implementation → operations
- Control → variances and feedback
- Review → learn, explain success and failures

Types of capital investment decisions

1. On the basis of existence

Replacement	Modernization	Diversification	Expansion
Same PPE Type but Buy new	New technology	Growth in new business	Growth in same business

2. On the basis of situation

Accept/reject	Mutually exclusive	Contingent
Independent	Dependent	Both dependent
Accept/reject one or more projects	Accept one and reject others	If accept one, then accept other also
Total Approach	Incremental / Total app.	Total approach

Calculation of Cash flows after tax

Depreciation → tax case	Relevant	Tax Depreciation relevant (note 3)
Depreciation → No tax	Relevant	Non-cash expenses
Opportunity Cost/Income	Relevant	Cost of next best alternative
Sunk cost	Irrelevant	Doobi hui cost like R&D. Incurred in past
Working Capital	Relevant	Investment in (CA – CL) (note 1)
Allocated OH	Irrelevant	No control, thop diye gaye (note 2)
Indirect taxes - GST	Irrelevant	ITC available

Note 1 WC Yo → Cash outflow

Middle years → make WC adjustment, if given in Q

Terminal year → release - Cash inflow of WC (assume even Q is silent)

Note 2 Allocated OH →

→ not incremental because of the project, vaise bhi yeh expenses hone hi the. Eg allocated HO cost

→ if incremental → consider. example, side effects due to project

Note 3 Take post-tax cash flows, if tax rate is given

Types of Depre	Used for	Based on	Tax paid
As per books	PAT	Individual assets (AS)	NA
As per IT Act - WDV	CF	Block of assets	If WDV, use block of assets
As per IT Act - SLM	CF	Individual assets (AS)	If SLM, make A/c type calc.

If silent ques → assume both dep to be same

➢ Conditions for depreciation as per Income tax act → Block of assets exists with value & Assets

Multiple Assets in block			
	Value	Assets	Treatment
Sale > block value	No	Yes	Depreciation ceases. Capital gain → Tax exp → CO
Sale < Block value	Yes	Yes	Depreciation calc. on remaining WDV
Only one Asset in block			
Sale > block value	No	No	Depreciation ceases. Capital gain → Tax exp → CO
Sale < Block value	Yes	No	Depreciation ceases. Capital loss → Tax saving → CI
Replacement Decision			
Sale of existing + Buy new	Yes	Yes	Calc. Dep base = Existing asset WDV + New purchase - Sale value of existing then, calc. dep

Initial cash flow → Yo → Cash outflow (CO)

Fresh	+ Cost of PPE	+ Installation	+ WC		
Replacement	+ Cost of PPE	+ Installation	Δ in WC	(-) Sale Of existing asset	+/- tax on CG

Interim cash flow → cash Inflow (CI)

Fresh	+ PAT	+ Non-cash exp	+ Dep	+ Δ in WC
Replacement	+ PAT	+ Non-cash exp	+Δ in dep	+Δ in WC

Terminal cash flow → Salvage value of assets +/- Tax on CG + Release of WC

Use Post tax discount rate and post-tax Cash flows

Capital Budgeting techniques

Traditional	Non-discounted- Ignore Time value of money (TVM)	Pay-back Period Accounting rate of Return
Modern	Discounted - consider TVM	NPV, IRR, MIRR, PI, Discounted pay back

Pay-back period

- Yo cash flow, Recovery, Time → Time required to recover initial CF, ignore TVM
- Uniform CF → Yo CO / CI yearly
- Non-uniform CF → cumulate CF yearly and stop when initial CO gets recovered
- Decision → Cut-off given by company decided by mgt
- If PB period > cut off → reject
- If PB period < cut off → accept
- Focus only on the initial CO recovery, Quick recovery → better, why? → less risk

Pay-back Reciprocal

- Yeh method payback ka ulta hai. Meaning - % of initial investment recovered each year
- Formula → CI x 100 / Yo CO
- Approx. IRR → quick IRR

Discounted Pay-back period

- Concept similar to payback period but here Cash flows are taken after TVM discounting
- Only Cumulative method can be used to calculate Discounted PB period

Accounting rate of return – ARR (ignore CF here - note 1)

ARR	Average PAT / Average Investment x 100
Average PAT	Sum of profit of all years / Years
Average investment	Opening investment + salvage value (note 2) / 2

Note 1 If cash flows are given → subtract investment cost from cash inflows to arrive at a/c profits

Average accounting profits = $\frac{\text{sum of all cash inflows – opening investment}}{\text{Life}}$

Note 2 If WC changes are given → also treat them +/- to numerator

If salvage value is not given → assume to be zero

Therefore, Average investment = $\frac{\text{Opening investment + 0}}{2}$ = 0.5 investment

- Decision → Cut-off given by company decided by mgt
- If ARR > cut off → accept If ARR < cut off → reject

Net Present Value – NPV → Variables – Cash flows, life, discount rate

To calculate FV → Compounding of cash flows → PV $(1+r)^n$

To calculate PV → Discounting of cash flows → $\frac{FV}{(1+r)^n}$

NPV	PV CI – PV CO PV CI is after-tax PV PV CO = initial investment + Δ WC		
If NPV ≥ 0	All investors are happy and WACC met → WM		
Decision	NPV ≥ 0	NPV = 0	NPV < 0
	Accept	Accept	Reject
Use of discounting rate	Desired rate of return = WACC / Risk adj. rate (Rf + Risk premium) (generally given in Q)		

PI index Method / desirability factor / profitability index (PI)

Formula	$\frac{\text{PV CI}}{\text{PV CO}}$ (used for ranking of mutiple projects) Disc. Rate = WACC or Q rate. Not IRR	
Decision	PI ≥ 1	Accept
	PI < 1	Reject
Cash outflow	Only one time	Take CO simply
	Multiple times	Separate table to calculate PV of CO

IRR method → rate at which NPV is zero. PV CI = PC CO

Decision	IRR ≥ cut-off rate	Accept
	IRR < cut-off rate	Reject
Method	Discount Rates are given	Use PVF from given tables
	Silent Q	Use hit and trial method

Modified IRR (MIRR) Terminal Value method → Pehle compound then discount

- IRR shortcoming – Multiple IRR possible if CFs reverse their signs during the project
- Calculating Future Value of CIs at Yn → reinvestment @ rate given in Q
- Single FV of CI after reinvestment
- Calculate IRR rate at which this single FV equates initial Co. this rate is MIRR

Re-investment Assumption

Methods	Discounting	Reinvestment
NPV	Discount Rate (DR)	Discount Rate
IRR	IRR	IRR → impracticable approach
MIRR	IRR	DR (WACC) → max realistic

Exclusion of Financing Cost Principle

- Decision in ID basis of NPV → Use WACC to calculate PV
- IRR → Compare with WACC
- WACC → Already includes effect of financing cost (take WACC post-tax if tax is given)
- To avoid double counting of Finance Costs → CF exclude → int on debt and dividend payment
- Treatment → EBIT (1-tax) or PAT + Int (1-tax)

Decision → Selection of projects (multiple scenario)

- Projects are independent → Think individually for each project.
- Projects are dependent → Think if all dependent projects are one project only
- Capital Resource availability with the company

<table>
<tr><th colspan="2">Abundant</th><th>Scarce</th></tr>
<tr><td colspan="2">Choose highest absolute return → NPV</td><td>Choose projects with highest return/rupee invested → PI</td></tr>
<tr><td>Divisible Projects</td><td>Non divisible projects</td><td rowspan="4">Calculate Profitability Index (PI)
Choose projects with the highest PI but within the investment amount available</td></tr>
<tr><td>NPV per rupee of capital invested or PI</td><td>Rank on basis of absolute NPV</td></tr>
<tr><td>Part projects for the remaining capital</td><td>Spend till max capital is available</td></tr>
<tr><td></td><td>Try combinations having highest max combined NPV</td></tr>
</table>

- Assumption → Project not divisible & non-repeatable if Q is silent
  → if projects are repeatable, invest in higher PI project

If there is a conflict in the ranking of projects by NPV & IRR method → Possible reasons

- NPV → absolute, IRR → % terms
- Absolute Size disparity between the two projects
- Skewness of cash flows → Reinvestment rate assumption difference
- Decision → Write an analysis with table of rankings which project is better per each method
- Give final decision based on NPV as NPV gives consistent results in line with WM

If the life of projects is unequal

Life of others project is exactly double	Other cases
Replacement method	Equivalent annualized criterion
Assume→ projects are repeatable	
Projects with half-life can be completed another time after the first completion	Calculate normal NPV of both projects
Calculate NPV of both projects now Project 1 → Run 1 - CO, CI. Run 2 - CO, CI Project 2 – Single run CO, CI	Calculate annualized NPV by dividing above with PVAF of each project basis respective life
Choose higher NPV	Choose with highest annualized NPV

- In ques, if loan/debt repayment is given Assume → loan is just an outside liability, Take int on loan as cost, think only from equity perspective, No financing cost exclusion principle for debt
  CFAT → EBIT – int – tax + dep
- If the stock level is changing → hint of changes in WC
- Ignore tax on salvage value, No CG tax unless mentioned
- If both CI & CO changing →compare NPVs of options
- IF CO is same, CI is changing → compare PV of CI of options
- IF CI is same, CO is changing → compare PV of CO of options
- If Pessimistic, most likely & optimistic scenarios given without probabilities → Calc. NPV separately
- Expected NPV → PVF x Cash flow (if probabilities are given x CF in each scenario)

Single project A	Comparison B	Accept	Reject
Payback/ARR/discounted PB	Cutt-off rate	A ≥ B	A < B
NPV	Absolute numbers	A ≥ 0	A < 0
IRR/MIRR	WACC	A > B	B > A

Multiple project	Comparison

Payback/discounted payback	Lesser the better
ARR/NPV/IRR/MIRR/payback reciprocal	Higher the better

Decision → Whether to invest in bond or share? Whether to sell?

- If undervalued – Buy. Overvalued – sell. How to compare?
- A. CMP with intrinsic value (IV)

  IV – Bond → PV of CFs @ Investor Required rate

  CF – Include both Interest received by investor and principal redemption

  CMP – Bond → given, ok. Else – PV of CFs @ Yield to Maturity
- B. NPV ≥ 0 for the investor
- C. Investor Required return > YTM of the bond
- IV - Share → PV of CFs from shares

  Refer Dividend Discount Model in Ch 8 – Dividend Decisions

Base Building of Dividend (D)

- D paid to owners of company → Eq shareholders, no fixed obligation on the company
- Objective → Meet expectations of shareholders →WM
- D → directly impacts growth rate (b x r)

Generally, → mature co. → High payout, growth co. → Low payout

- Cum Dividend Price → Price of Shares before record date but after declaration of D by Co (Q8 TYK)
- Ex-Dividend Price → Price of Shares after record date (Use for CMP in CoC)
- Record Date → Dote on which the owners of the shares are entitled to dividend
- Interim Dividend → Dividend paid in between the year (not in AGM)

Forms of dividend

1. Cash dividend → paid in cash (Bank) in currency
2. Buy-back → Treasury → investment purpose (not allowed in India)
   Canceled → BV capital reduction = Shares Bought x Buy Back Price (Q9 TYK)
3. Bonus → shares distribution – free shares

Note: Not a form of dividend

Stock Split → one share split into multiple shares (Increase no. of shares and reduce CMP)

Sources of dividend

1. Current earnings → Current Cash already available
2. Old R & S → Old Cash available
3. If no cash → Cash generated from New equity shares issue → new shares = $\frac{\text{dividend to be paid}}{\text{NP/CMP}}$
4. If company opts no dividend → May make shareholder unhappy, no cash flow to shareholder

Homemade Dividend → shareholder sells shares of co. in market @ CMP, so that his cash flow is not affected (same as cash flow which should have been from Dividend)

General Thumb Rule (Gordon and Walter Model)

Company ROI (r) IRR	Capitalization Rate (Ke)	Optimum Dividend payout ratio
High	Low	0 Dividend (low)
Low	high	100% Dividend (high)
Equal	equal	Any ratio is fine

Dividend Payout Policy	Analysis
Constant Dividend Policy	Absolute Dividend is constant use dividend equalisation reserve, in years of fluctuating EPS
Stable Dividend policy	DPR ratio is constant (% Div of EPS is constant)
Random Div policy	No fixed policy. (ICAI - 25% 50%, 75%, 100%)

Ratio	Formula
Dividend Per Share (DPS)	Total Dividend / No. of shares or EPS x payout ratio
Dividend Payout ratio (DPR)	DPS x 100 / EPS
Dividend Rate	Dividend / Face value
Dividend yield	Dividend / CMP
Retention ratio	1 – DPR or RE / EPS

Theories of Dividend

Theories	Meaning	Models
Irrelevance theory	Dividend policy has no effect on CMP or value of firm (Vf)	MM approach (un-realistic)
Relevance theory	Dividend policy impacts CMP, Vf	Walter and Gordon model
Others		Traditional and Linter's model

Models	Formula	Optimum Dividend Policy
Walter Model*	$Po = \frac{D + (E-D)\frac{r}{Ke}}{Ke}$	Refer thumb rule
Gordon Model	$Po = \frac{D_1}{Ke - g}$	Refer thumb rule
Graham & Dodd Model (Traditional)	$Po = m\left(D + \frac{EPS}{3}\right)$	100 % Dividend (High)

*Assumption by model - RE is the only source of new finance. g is only possible from RE

R & CoC are constant with free information for all & perpetual life

Here r = expected company ROI in %.

If Q silent r = Earning for Equity / Book value of Equity

Ke = expected/required return on equity share by investors, equity capitalization rate

Ke = 1/PE ratio (last-resort)

Linter 's Model

D → should be stable, If EPS is variable/fluctuating, try to make D stable/smooth it out

Use Adj Factor (Af) → Speed of Adjustment (based on some criterion)

D1 = Do + (Af (target D – Do))

Target D = EPS_1 x DPR

Residual payment policy

D = residual PAT after subtracting the equity portion of Capex

D = Earnings – (Capex required x weight of equity in Capital Structure)

Dividend Discount Model

Po = If shares are not sold = PV of all dividends

If shares are sold = PV of dividends till holding + PV of sale price

If growth is variable = PV of dividends till variable growth + PV of sale price thereafter

MM hypothesis (We need to Prove it)

- Price depends on earning power of co. Not how the company splits up the EPS in D & RE
- Therefore, DPR is irrelevant for Price of Shares

Po/MPS = PE x EPS

Value of Equity (Po) = $\frac{\text{PAT / Earnings for Equity}}{\text{Ke}}$

Steps to solve the question :

1. Calculate P_1

   $Po = \frac{D_1 + P_1}{1 + Ke}$ (PV of cash flows after one year → TVM)

2. For new CapEx → first use RE then → issue new shares

   New money to be raised at end of year 1 = (Investment required in capex + D_1) – RE

   No. of New shares (issued as year 1 end) = $\frac{\text{New money to be raised}}{P_1}$

3. Calculate existing value of equity/ Po of shares
4. Existing No. of equity shares x Po = $\frac{\text{((existing + new shares) x } P_1\text{) – Investment + Earnings}}{1 + Ke}$
5. Prove that LHS = RHS

Base Building

- Quick easy analysis of FS. numbers, Easy to analysis and draw conclusion
- Comparisons → Intercompany - Different companies → Vertical analysis
- Comparisons → Intra company → horizontal analysis - different time periods
  → vertical analysis - different book values
- Helps to make financial decisions, identifies strength and weaknesses
- Stakeholders use these ratios to make economic decisions

Shareholders → current & potential — Management
Creditors — Lenders/ investors/ bonds

ROE using Du Pont model analysis

ROE → Earnings for Eq Sh → PAT (If no pref shares)
Equity Sh funds NW (If no pref shares)

Net Profit Margin	x	Investment Turnover Asset	x	Equity multiplier
Profitability		Efficiency		business multiplier
→ PAT x 100 (in %)		Sales		Investment/Asset
Sales		Investment/asset		Eq Sh funds
In %		In times		In times

Notes

- Sales → net of GST (indirect taxes) and returns
- Equity shareholder funds → ESC + R&S – fictious assets
- Share-holder Equity/ Prop. Funds / Sh funds / net worth → ESC + R&S – fictious assets + Pref shares
- Net assets = Capital employed = Sh eq + NCL or NCA + CA – CL or NCA + WC
- Ignore or exclude if fictious assets are given.

- If ratio is between BS and P& L, take BS average figures if possible
- If both Op & Closing BS fig given - Average BS figures unless Q specifically prohibits
- If only Closing BS fig given for year 1 – Take closing only (for both years Y1 and Y2) (Ill 1 ICAI)
- Don't take cash cost or any finance adj like WC chapter. Take a/c fig. The intent is different here

Ratio	Formula	Explanation
Liquidity Ratio → ability to meet short term obligations		
Current Ratio	CA / CL	Ideal ratio is 2 – even if CA falls, enough margin to pay CL
Quick Ratio/ Acid test ratio	Quick Assets / CL	Ideal ratio is 1. Quick assets = CA – inventory – prepaid exp
Absolute Liquid / Cash Ratio	Cash+ Bank + marketable Sec / CL	Absolute Liquid assets = Cash + bank + marketable sec
Basic Defense Interval Ratio	Cash+ Bank + marketable Sec + AR / QA / Cash Op. Exp per day	Meet regular cash expenditures if sales stop and business need to continue
Net WC	CA – CL	CL - exclude short term bank loan
Capital Structure Ratio → Ratios to analyze capital structure		
Equity Ratio	Sh. Equity / Net Assets / CE	Owner's fund to total fund invested.
Debt Ratio	Total Debt (NCL + CL) / Net Assets / CE	Outsider's funds
Debt to equity Ratio	Total Debt (NCL + CL) / Sh Eq	
Debt to Total Assets Ratio	Total Debt / Total Assets	how much of total assets is financed by the debt.
Capital Gearing Ratio	PSC + Debt / Eq sh cap + R&S	Fixed sources of Cap divided by equity Sh funds
Proprietary Ratio	Prop. Fund / Sh funds / Total Assets	proportion of total assets financed by shareholders.
Coverage Ratios → solvent in long term ?		
Debt Service Coverage Ratio (DSCR)	Earnings for debt / Int + Instalment	Ideal ratio is 2. Debt service → Int + installment E for debt → PAT + non cash exp + Int
Interest Coverage Ratio	EBIT / Interest	Ideal ratio is > 1.
Pref Div Coverage Ratio (Pref Cover)	PAT / Pref div	Ideal ratio is > 1.
Equity Cover	Earnings for Equity / Eq div	
Fixed Charges Coverage Ratio	EBITDA / Int + Installment + Pf div	The ideal ratio is > 1.
Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio		

Total Asset Turnover Ratio	Sales / Avg Total Assets	sales generated by each rupee's assets invested in the business
Fixed Assets Turnover Ratio	Sales / Fixed Assets	sales generated from each rupee invested in fixed assets
Capital Turnover Ratio	Sales / Net Assets / CE	Sales generated per rupee of long-term investment.
WC Turnover Ratio	Sales / WC	efficiency of the firm to use WC
Inventory Turnover Ratio (ITR)	COGS / Avg Inv	Higher the better
Debtors Turnover Ratio	Credit Sales / Avg AR	Gross AR → don't exclude prov for bad debts Higher the better
Receivables Velocity – Days Sales outstanding (DSO)	Avg AR / Credit sales daily	Or 365 / Deb Turnover ratio Lower the better
Days In Inventory (DII)	Avg Inv / COGS per day	Or 365 / Inventory Turnover Ratio Lower the better
Payables Turnover Ratio	Credit Purchases / Avg AP	
Payables Velocity – days payable outstanding (DPO)	Avg AP / Daily Credit Purchases	Or 365 / Payable turnover ratio
Profitability Ratios based on Sales		
GP Ratio	GP / Sales ×100	GP = Sales - COGS
NP Ratio	NP / Sales ×100	NP = PAT
OP Profit Ratio	OP Profit / Sales × 100	Op Profit = EBIT = Gross Profit – Op exp + Op Income
Expenses Ratio		
COGS Ratio	COGS / Sales	Op. exp = Indirect expenses exc. COGS, interest or tax Op Cost Ratio + Op Profit Ratio = 100%
OP Exp Ratio	Admin exp + Selling o/h / Sales	
OP Cost Ratio	COGS+ OP exp / Sales	
Financial Expenses Ratio	Financial expenses / Sales × 100	
Profitability Ratios related to Overall Return on Assets/ Investments		
Return on Investment (ROI)	Return /Profit /Earnings / Investments	Profitability Ratio x Investment Turnover Ratio

Return on Assets (ROA)	PAT / Avg Total Assets	
Return on Capital Employed ROCE (Pre-tax)	EBIT / Capital Employed	Capital Employed = Total Assets – CL Or Net assets = Fixed assets + WC = Net Worth + NCL
Return on Total Assets (ROTA)	EBIT (1-t) or PAT + Int / Avg Total Assets	
Return on Net Assets (RONA)	EBIT (1-t) / Avg Net Assets	Net Assets = Capital employed
Return on Capital Employed ROCE (Post-tax)	EBIT (1- t) or PAT + Int / Capital Employed	If silent Q, solve both pre-tax and post-tax ROCE
Return on Net Worth (RONW)	PAT / Net Worth	Net worth = Eq Sh funds + Pref shares
Return on Equity (ROE)	Earnings for Eq / Eq sh funds	
Profitability Ratios Required for Analysis from Owner's Point of View		
EPS	Earnings for Eq / No of equity shares	overall profit generated for each share
DPS	Div to ESH / No of equity share	
Dividend Payout ratio (DPR)	DPS / EPS	Proportion of profit distributed per EPS
Profitability Ratios related to market/ valuation/ Investors		
MV/BV per Share	MV per share / BV per share	market response of shareholders' investment.
BV per Share	Eq Shareholder funds / No. of Eq share	
Q Ratio	MV of eq. + MV of debt / Replacement cost of assets	>1 = Overvalued firm higher than assets <1 = Undervalued firm, can be taken over by some large shark

Base building (Objective) of Working Capital (WC) / Circulating, fluctuating, floating capital

- Net WC → Current assets (CA) – Current Liabilities (CL)
- Gross WC → Current assets
- WC Management → Manage CA and CL → Adequate level and financing of WC
- Objective → maintain sufficient CF to meet day-to-day operating exp. and CL
- Adequate WC? Estimation of WC → a. Operating Cycle Method
  b. Holding periods (CA – CL) approach
  Financing policies (SOF)
- Types of WC → permanent → Minimum Avg CA required → long term
  → fluctuating → seasonal → short term

Approaches of WCM → WC investment policies

Basis	Aggressive	Moderate	Conservative
WC	Low	Adequate	High
Risk	High	Medium	Low
Profitability	High	Trade-off	Low
Solvency	Low liquidity		High liquidity

Operating Cycle/ WC Cycle / cash cycle → Cash to Cash cycle

- Operating cycle Days = Inventory + AR -AP
- Inventory = RM + WIP + FG
- Lower the better
- No. of OP cycles in a year / Cash turnover = 365/OP cycle days
- Forecasted WC / Min. level of cash to be maintained = $\frac{\text{operating cash cost p.a.}}{\text{No. of cycles}}$

Holding periods (CA – CL) approach

- Individually calculate BS balances of individual components of CA & CL
- Thumb Rule → Days = $\frac{\text{BS avg.}}{\text{PL per day}}$

BS Avg = days x PL per day
= days x (units/day x amt/unit)

Estimation of WC	Rs
1. Current Assets / Gross WC a. Inventories (RM, WIP, FG) b. AR c. Cash d. Other CA	
2. Current Liabilities a. AP b. Other CL	
3. Excess of CA over CL (1-2)	
4. Safety Margin (If in %, apply on 3)	
5. Net WC (3+4)	

Days (A = B/C)	BS avg (B)	PL per day (c)
RM	Avg RM	Avg cost of RM consumption per day
WIP	Avg WIP	Ques info
FG	Avg FG	Avg cash COGS/cost of prod per day
AR collection period (DSO)	Avg AR	Avg cash cost of sales per day
Credit period AP (DPO)	Avg AP	Avg credit purchases per day

PL Per day	Units	Cost per unit
RM	Estimated productions (units) 12months/365 days	RM cost
WIP		WIP Cost – Average* RM full, Other direct costs - half
FG		Cash Cost of production
AR	Estimated credit sales (units) 12months/365 days	Cash Cost of Sales

Evaluation approaches

- A. Cash cost (assume - if ques is silent)
- For valuing AR and FG, take only cash cost (exc. Dep, profits, non-cash exp)
- If A/c figures for AR/FG given → treat for above – Imp adj.
- B. Total Approach → Normal A/c. fig. (only if question specifically says in WC. Default in Ratios Ch.)
- *Average concept only for WIP. No other item

- Existing Company → assume Opening RM stock = closing RM stock (if Q silent)
  Credit Purchases = RM consumption +/- Changes in inventory
- New company → Opening stock = zero

- Credit purchase = RM consumption + closing stock
- New company → 2 years projections required

	Year 1	Year 2
Opening Balance	0	Closing of year 1

Cost Sheet

Existing company (assume Opening stock = Closing)	Amount
RM	1
+ Direct Labour	2
+ D Overhead (assume if ques is silent)	3
= Prime cost	1+2+3
+ Factory OH	4
= Factory cost	1+2+3+4
+ Admin OH (production-related) (assume if silent)	5
= Cost of production/COGS (FG)	1+2+3+4+5
+ Selling exp	6
+ Admin exp	7
= cost of sales (AR)	1+2+3+4+5+6+7
+ Profit	8
= sales	1+2+3+4+5+6+7+8

Double Shift of labour

- Fixed Assets better utilized. Better efficiency and growth

Items that will double	Items remaining same
RM, FG units	WIP
Sales & Production	Fixed Cost
AR, AP	
Variable – Prepaid/Accrued	Fixed – Prepaid/Accrued

- Second-shift workers are paid at higher rate or change in prices – need to adjust (Super 30 Q)
- If any provision or provision for bad debts → include in WCM
- If OH include dep as well →take only cash OH as cost → exclude dep

Cash budgets

- To budget for cash → surplus - invest, deficit sell prior investment, else, borrow
- Calculation Methods →

A. Receipts & payments method – Direct CF (exc. Dep and other non-cash exp)
(Opening + Receipts - Payments | Adj of Surplus/Shortfall)

B. Adjusted income method - Indirect CF (Statement of sources and uses of funds)

- Cleared funds → funds cleared → receipt/ payment made from bank
- Un-cleared funds → date cheque is received till cleared by the bank actually

Managing Cash objectives ➔ Accelerate Cash Inflow, Delay Cash Outflow

1. Reduce floats

Types of float	Easy meaning
Billing floats	Bill banane ka time
Mail floats	Customer se cheque apne pass lane ka time
Cheque processing	Apne se bank cheque pohunchane ka time
Bank processing floats	Bank ka Cheque ko clear ka time

2. Decentralised banking
   a. Concentration Banking – Decentralized branches to collect cheques and deposit locally
   b. Lock Box System – Rents local post office box, customers mail chq to them and bank directly collects from the box. Reduce mail, cheque processing and bank processing float

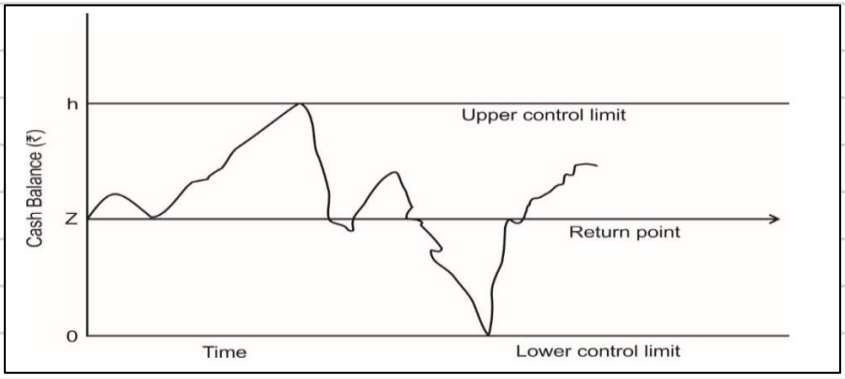
Cash Management models

- A. BAUMOL's Model (Certain CFs) → Inventory type = EOQ

- Optimum cash balance (ICAI) = $\sqrt{\frac{2x \text{ annual cash demand } x \text{ transaction cost/txn}}{\text{Opp cost per Rs p.a.}}}$
  Optimum Conversion size

- Carrying and Transaction costs yearly should be low
- No of transactions/conversions = annual cash demand/conversion size
- Annual transaction costs = transaction cost per txn x No. of transaction
- Annual carrying loss = average cash balance x ROI % (Opp. Cost)
- Average Cash balance = Optimum Transfer Size / 2
- Time interval between two conversions = 360/No. of conversions

- B. MO Model (Uncertain CFs) Stochastic model → No txn between upper till lower.
- Surplus > upper → Invest = upper - return. Deficit < lower →Sell investments
- Principles in mind to invest surplus cash / Basis of selection of securities
  - A. Safety → Quality
  - B. Maturity → Duration
  - C. Marketability → Liquidity



AR management

Scenario	Benefit		Impact on cost	
	Sale	Cash Disc.	Bad debt	WC required
High AR	High	Low	High	high
Low AR	Low	high	Low	Low

- Objective → design optimum credit policy, Balance between benefit and cost. Max overall benefit
- How → hit and trail method
- Expression of Credit Policy → 3/15 net 50
- Meaning → if paid in 15 days → 3% cash discount, else pay in 50 days overall

Approaches to evaluation of credit policies – Hit & trial method

- A. Total Approach (Easier) → Take total figures in different scenarios
- B. Incremental Approach (if Q says) → Take incremental figures from base scenario

Notes

- Fixed Cost = Total Fixed cost x % of Credit sales
- Bad Debts = Total Credit Sales x Bad debts %
- Cash Discount = Credit Sales x % of AR availing discount x % of Cash discount

➢ Opportunity Cost = Average AR balance x ROI %

Cash Cost of Credit sale x Days AR / 360 / 365 x ROI %

Evaluation of Credit Policies – Total approach	Present	Proposed
1. Expected Profits (P&L) a. Credit Sales b. Operating Costs – Variable – change with sale c. Fixed – remain same d. Financing Costs – Bad debts e. Cash Discount EBT f. Tax PAT		
2. Opportunity Cost of AR investment (no tax impact)		
3. Net Benefits		

Financing of AR

1. Trade payables (AP) -spontaneous source of finance
2. Pledging → bill discounting → loan against AR
3. Factoring → sale of AR → cash. AR derecognized
4. Forfeiting →like non-recourse factoring → used in international trade

Factoring type	Recourse	Non- recourse (Assume - if q is silent)
Risk	Not transferred	Transferred
Bad debt losses	Co pays to factor	Factor bears losses
Cash discount cost	No	No

Effective Cost of Factoring

	Amount
1. Net Amount Received from Factor a. Average AR (Annual Credit sales x Credit Period/365) b. Less – Haircut / Reserve → % of a c. Less - Commission of Factor → % of a d. Gross receivable (a-b-c) e. Interest upfront → d x ROI % x Credit Period/365 Net amount received = d - e	

2. Net Cost of Factoring a. Costs i. Annual Factoring Commission = Annual Credit sale x rate ii. Annual Interest Cost b. Saving i. Bad debt saving ii. Avoidable Admin costs saved iii. Cash discount saved	
3. Effective Cost of Factoring = 2 / 1	

Inhouse cost of AR > Effective Cost of factoring → Choose Factoring

< → Choose Inhouse

AP management (cost of loss cash discount)

- A. Simple Interest (default) → PV (1 + (r x days/365)) = FV
- B. Compounding Interest → only one sum Illus 17 ICAI → PV $(1 + r)^{T}$ = FV

PV = Discounted payment FV = Full Payment Days = Difference in Full & discounted days

- Decision if Purchases not given → r (as above) > Opp Investment Return = Take discount

  < = Refuse discount
- Decision if Purchases given → hit & trial method

Cases	Accept discount	Reject discount
Payment (principal)	Purchase x (1- discount)	Purchases
Less: Interest earned on Opp. investment		Purchases (1-D) x ROI % x $\frac{\text{Diff Days}}{365}$
Decision	Accept the Lower cash outflow of both	