Chapter:- Ratio Analysis

⇒ It means relationship between two or more financial data for the purpose of decision making.

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

Statement of Capital Employeed

Equity Capital	xx
+ All Reseme & Surplus	xx
(-) PIL A/C (Dr. bal.)	(xx)
(-) Miscellaneous Expenditure	(xx)
Equity shareholder's Fund	xx
+ Preference share Capital	xx
Shareholder's Fund / Networth / Proprietory Fund	xx
+ Long-term Debt & borrowing (Debenture, Bonds, Bank loan etc)	xx
Capital Available	xx
Less:- Non-trade Investment	(xx)
Total Capital Employeed	xx

Note:- Investment

Trade-Investment
* Investment to operate business
* Eg:- SF Investment, Asset Replacement Investment etc.

Non-trade Investment
* Investment to earn income.
eg: share, Debenture, Capital WIP etc.

Statement of Profit

sales	xx
Less:- COGS	
- material	(xx)
- Labour cost	(xx)
- manufacturing expense	(xx)
Gross profit	xx
Less:- Operating expense	
- Administrative expense	
- selling & distribution	(xx)
Operating profit (PBIT)	xx
Less:- Interest	(xx)
Profit befor Tax (PBT)	
Less:- Tax	(xx)
Profit After Tax (PAT)	xx
Less:- Preference Dividend	(xx)
Earning for Equity (EAE)	xx
Less:- Equity Dividend	(xx)
Retained Earning	xx

Types of Ratio

- Financial Ratio
  - ST Solvency Ratio
  - LT Solvency Ratio.
- Activity Ratio / Turnover Ratio
- Profitability Ratio
- Market-Test Ratio.

Short-Term Solvency Ratio

a. Current Ratio = $\frac{\text{Current Assets}}{\text{Current liabilities}}$ (2:1)

b. Liquid / Acid-Test / Quick Ratio

= $\frac{\text{Liquid Assets}}{\text{Liquid liabilities / Current liabilities}}$

* Liquid Assets = CA - stock - prepaid
* Liquid Liabilities = CL - Cash credit - Bank overdraft.

c. Super Quick Ratio (Absolute liquidity) = $\frac{\text{cash + Bank + Marketable securities}}{\text{Current liabilities}}$

d. Cash Interval Ratio (Basic Defense Ratio) = $\frac{\text{cash + Bank + marketable securities}}{\text{Avg. Daily cash expense}}$

* Avg Daily cash expense = $\frac{\text{Total cash expense}}{365}$

e. Net working Capital = CA - CL

Activity Ratio

⇒ Revenue generated per rupee of resources utilized.

① Fixed Assets / Total Assets / working Capital / Capital Employed turnover Ratio

= $\frac{\text{Turnover / sales}}{\text{Avg Total Assets / FA / WC / CE}}$

② stock turnover (ITR) = $\frac{\text{cogs / sales}}{\text{Avg. Inventory}}$

velocity / Holding period = $\frac{365/12m/52week}{ITR}$

③ Debtor turnover (DTR) = $\frac{\text{Credit sales}}{\text{Avg. Debtor.}}$

Holding / velocity period = $\frac{365/12m/52weeks}{DTR}$

④ Creditor turnover Ratio (CTR) = $\frac{\text{Credit Purchase}}{\text{Avg. Creditor}}$

Holding / velocity period = $\frac{365/12m/52week}{CTR}$

Long-term Solvency Ratio

a. Equity Ratio = $\frac{\text{shareholder's Fund}}{\text{Capital Employed}}$

b. Debt-Ratio = $\frac{\text{LT Debt / Total Debt}}{\text{Total Debt + Networth}}$

c. Debt-Equity = $\frac{\text{LT Debt}}{\text{shareholder's Fund}}$

d. proprietory Ratio = $\frac{\text{shareholder's Fund}}{\text{Total Assets (Net Assets)}}$

e. outside liabilities to Assets Ratio = $\frac{\text{outside liabilities}}{\text{Total Assets}}$

f. Gearing / Leverage Ratio

= $\frac{\text{Fixed cost Capital}}{\text{Total Capital Employed.}}$

Fixed cost Capital = preference + LT Debt

g. Capital Gearing = $\frac{\text{Fixed cost Capital}}{\text{variable cost Capital or Equity shareholder's Fund}}$

h. Fixed Assets Ratio = $\frac{FA}{\text{LT Debt.}}$

① Coverage Ratio

* Interest = $\frac{PBIT}{\text{Interest}}$

* Preference Dividend = $\frac{PAT}{PD}$

* Equity Dividend = $\frac{EAE}{ED}$

* Debt-service = $\frac{PBIT(1-t) + \text{Non-Cash Expen}}{\text{Annual Installement (principle + Interest)}}$

* Fixed charge = $\frac{EBIT + \text{Depriciation}}{\text{Interest} + \frac{\text{Loan Repayment}}{(1-t)}}$

Profitability Ratio

Sales	xx
Less:- GST	(xx)
Less:- Sales return	(xx)
Net sales	xx

① GP Ratio = $\frac{\text{Gross profit}}{\text{Sales}} \times 100$

② COGS = $\frac{\text{COGS}}{\text{Sales}} \times 100$ [100% - GP Ratio]

③ Net profit Ratio = $\frac{\text{PAT}}{\text{Sales}} \times 100$

④ operating Profit Ratio = $\frac{\text{PBIT}}{\text{Sales}} \times 100$

⑤ operating Ratio = $\frac{\text{operating cost}}{\text{Sales}} \times 100$

= [100% - operating profit Ratio]

operating cost = COGS + operating expense.

⑥ Operating Expense Ratio = $\frac{\text{Operating expense}}{\text{Sales}} \times 100$

⑦ ROI/ROA/ROCE = $\frac{\text{PBIT}}{\text{Avg. CE}} \times 100$ or $\frac{\text{PBIT}(1-t)}{\text{Avg. CE}} \times 100$

⑧ ROE/share holder's Fund = $\frac{\text{PAT}}{\text{Avg. NW}} \times 100$

⑨ ROESF = $\frac{\text{PAT} - \text{PD}}{\text{Avg. ROESF}} \times 100$

⑩ Cash profit = $\frac{\text{PAT} + \text{Non-Cash Expense}}{\text{Sales}} \times 100$

Market-Test Ratio.

① EPS = $\frac{\text{EAE}}{\text{No. of Equity shares}}$

② DPS = $\frac{\text{Equity Dividend}}{\text{No. of Equity shares}}$

③ Earning / market Yeild = $\frac{\text{EPS}}{\text{mp}} \times 100$

④ Dividend Yeild = $\frac{\text{DPS}}{\text{mp}} \times 100$

⑤ P/E Ratio = $\frac{\text{mp}}{\text{EPS}}$

⑥ Dividend pay-out = $\frac{\text{DPS}}{\text{EPS}} \times 100$

⑦ Retaintion Ratio

= $\frac{\text{Retained Earning}}{\text{EAE}} \times 100$

= 100% - Pay-out Ratio

⑧ BVPS = $\frac{\text{Net worth}}{\text{No. of Equity shares}}$

⑨ mv/ BVPS = $\frac{\text{mp}}{\text{BVPS}} \times 100$

Du-pont chart:-

1. ROI/ ROCE = operating profit Ratio x Capital Turnover Ratio

= $\frac{\text{PBIT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{CE}}$

② ROE = NP Ratio x Assets Turnover x Equity multiplier

= $\frac{\text{PAT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Net worth}}$

Chapter :- Leverage

1. **Meaning**

⇒ Effect of Fixed cost on profitability. Firm should use fixed cost capital in order to maximize shareholder's wealth. However, Fixed cost capital act as double-edge sword.

Eg. 'A' Ltd :- Sales = 1000,000

VC = 40%, Tax = 50%, FC = 100,000

Capital Structure :

10% Debenture = 500,000

10% PSC = 200,000

Equity (₹10) = 100,000

Case-1 :- Sales increase by 100%.

Case-2 :- Sale decrease by 50%.

Particulars	Case-2	Present	Case-1
Sales	500,000	1000,000	2000,000
(-) variable cost	200,000	400,000	800,000
Contribution	300,000	600,000	1200,000
(-) Fixed cost	100,000	100,000	100,000
Operating profit (PBIT)	200,000	500,000	1100,000
(-) Interest	50,000	50,000	50,000
PBT	150,000	450,000	1050,000
(-) Tax expense	75,000	225,000	525,000
PAT	75,000	225,000	525,000
(-) Preference Dividend	20,000	20,000	20,000
ⓐ EAE	55,000	205,000	505,000
ⓑ No. of Equity share	10,000	10,000	10,000
ⓒ EPS (a/b)	5.5	20.5	50.5

Business Risk	Financial Risk.
* It refers to risk associated with firm's operation * unavoidable in nature. * Represented by variability in operating profit (PBIT) * It is associated with revenue & operating cost	* Risk associated with capital structure. * Avoidable in nature. * Represented by variability in earning Available Equity (EAE) * It is associated with financial fixed cost i/e capital structure.

Particulars	operating Leverage	Financial Leverage	Combined Leverage
meaning	use of operating fixed cost to increase operating profit	use of financial fixed cost to increase EPS.	use of both fixed cost to increase EPS.
calculation	$= \frac{\text{Contribution}}{\text{PBIT}}$	$= \frac{\text{PBIT}}{\text{EBT} - \frac{\text{PD}}{(1-t)}}$	$= \frac{\text{Contribution}}{\text{EBT} - \frac{\text{PD}}{(1-t)}}$
Degree of Leverage (DOL)	$\frac{\%\text{ change in EBIT}}{\%\text{ change in Revenue/ contribution}}$	$\frac{\%\text{ change in EPS}}{\%\text{ change in EBIT}}$	$\frac{\%\text{ change in EPS}}{\%\text{ change in Revenue/ contribution}}$
Affected by	operating fixed cost	Financial Fixed cost	Combined fixed cost.

Note:- If operating Risk is higher, reduce financial Leverage in order to maintain overall Combined Leverage.

Effect of Financial Leverage on ROE

$$ROE = ROA + (ROA - K_{at}) \times \frac{\text{Debt}}{\text{Equity}}$$

where, $ROA = \frac{PBIT(1-t)}{CE} \times 100$

$PBIT(1-t) = NOPAT$

K_{at} = After Tax cost of debt.

Conclusion:- Financial Leverage has positive impact on ROE, if After tax cost of debt is lower than Return on Assets (i/e ROA > K_{at})

Relationship of operating Leverage with BEP & MOS

(i) operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}}$

(ii) BEP $= \frac{\text{Fixed Cost}}{\text{Contribution/unit}}$

Relationship

operating Leverage ↑, FC ↑, BEP ↑, MOS ↓ & vice-versa.

Chapter :- Cost of Capital

1. Source of Capital

Long-term source of Fund → 'A' Ltd → Investment in long term fixed assets & Investments.

Eg:- LT Debt, ESC, PSC
→ Maturity Risk
→ High cost than ST fund.

Coverage
→ specific cost
→ Wgt. Average cost
→ Revised weighted Average cost
→ marginal cost of Capital

* Generate higher return to meet cost of LT source of Fund.
* High Risk.

1. Specific Cost :-

Capital	Computation	
	Irredeemable	**Redeemable**
1. Debt (LT loan, Debenture, bond etc.) (Kdt)	$= \frac{\text{Interest}(1-t)}{\text{Net proceed (NP)}} \times 100$ $= \text{Int}(1-t)$ [Rate] NP = Ip - Floatation cost If Issue price not given, Ip = mp, FV	$= \frac{\text{Int}(1-t) + \frac{Rv-NP}{n}}{(Rv+NP)/2} \times 100$ $= \frac{\text{Interest} + \frac{Rv-NP}{n}}{(Rv+NP)/2}(1-t) \times 100$ [Tax benefit on discount & premium] x n = remaining period to maturity * If loan repaid → Calculate Interest on outstanding balance.
Preference share Capital (Kp)	$= \frac{PD}{Po/NP} \times 100$	$= \frac{[PD + CDT] + (Rv-NP)/n}{(Rv+NP)/2} \times 100$
Equity Capital (Ke)	**Divident Approach** $= \frac{DPS}{Po/NP} \times 100$ [No growth] $= \left[\frac{D_1}{Po/NP} + g\right] \times 100$ [growth] $D_1 = D_0(1+g)$	**Earning Approach** $= \frac{EPS}{Po/NP} \times 100$ (No growth) $= \frac{E_1}{Po/NP} \times 100$ (growth) $E_1 = E_0(1+g)$

where,

D_1 = Expected, pays

D_0 = Just paid, last year dividend, current year dividend

⑤ CAPM = $R_f + (R_m - R_f) \times \beta$

R_f = Risk-free return

R_m = Market Rate of return

β = Beta of company.

⑥ Realised Yeild = $\frac{D_1 + (P_1 - P_0)}{P_0} \times 100$

Retained Earning

$K_r = K_e$ [If no flotation cost]

i/e $K_r = \left[\frac{D_1}{P_0} + g\right] \times 100$

If personal Tax & brokerage given,

K_r = K_e (1 - personal Tax) - Brokerage [on Investment]

= K_e (1 - personal Tax) (1 - Brokerage) [on Return]

2. Weighted Average cost of Capital:

$WACC = [W_a \times K_{at} + W_p \times K_p + W_e \times K_e]$

Weight can be based on:-

1. Book value Approach
2. Market value (MP of Equity covers Retained Earning)
3. Target Debt-Equity [Financing for new project]

3. Revised Wgt. Average cost of Capital.

⇒ In case of change in source of Capital i/e

(i) introduction of new capital.

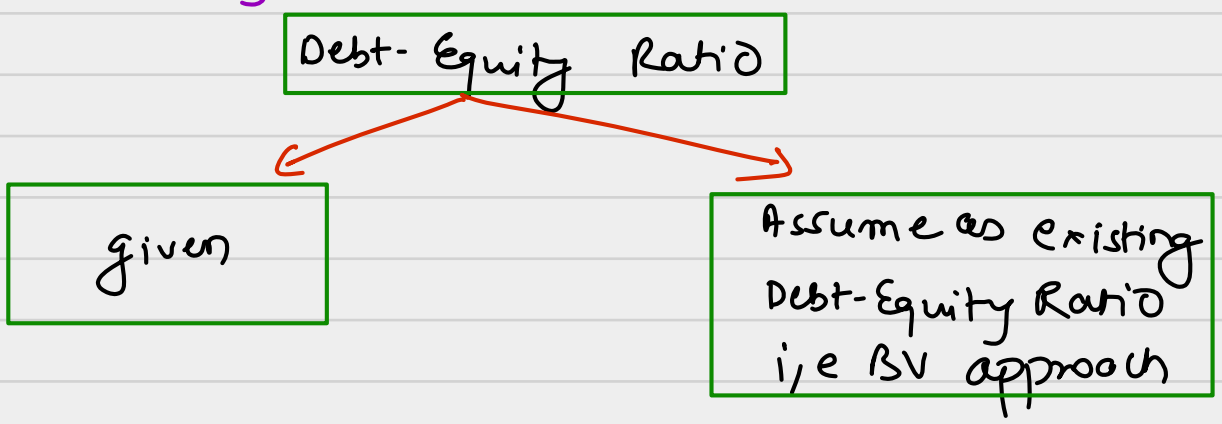
(ii) Redeemption of old Capital.

It is necessary to calculate Revise weighted Average cost of Capital

⇒ Calculated same as above.

4. Marginal cost of Capital:-

⇒ Cost of additional Capital.
⇒ It is incremental cost.
⇒ financing pattern of new capital.



Equity Capital can be arranged by issue of new shares or Retained Earning.

Note: For the purpose of determining cost of capital

(i) take ex-dividend share price
(ii) " ex-interest debenture price.

Chapter :- Capital structure

Coverage :-

Practical

1. Capital structure Theories
2. EBIT- EPS- MPS Analysis
3. Financial break-even & EBIT Indifference point

Theoretical

① Over / under Capitalization
② factor Affecting Capital structure.

1. Capital structure Theories

Relevance Theory
1. Net Income Approach
2. Traditional Approach

Irrelevance Theory
1. Net operating Income Approach
2. Modigliani & Miller Approach

Other theory
1. Trade-off theory
2. Pecking theory

1. Net Income Approach :-

⇒ Financial leverage ↑, wgt. avg cost of Capital ↓, value of firm ↑

⇒ Firm should use financial leverage to increase value of firm.

⇒ Ke is given & constant, we need to find Ko & Vf.

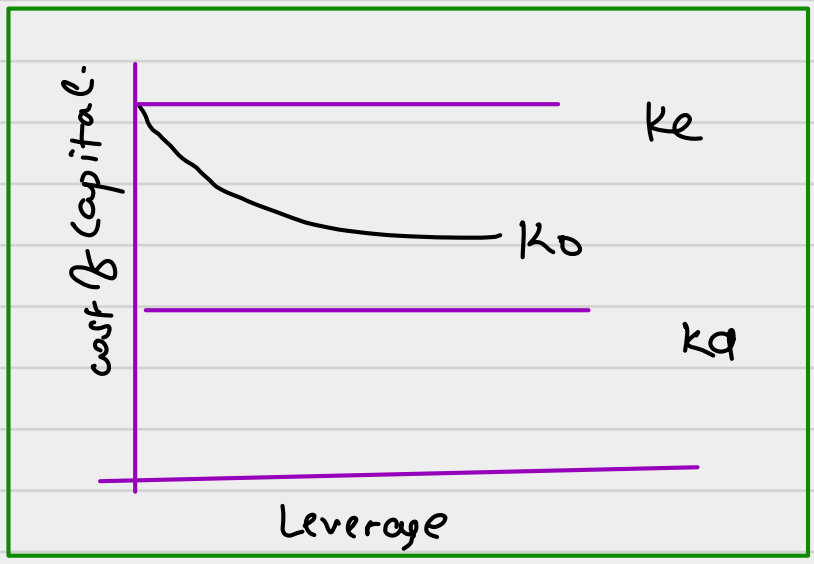
$V_e = \frac{PAT}{Ke} = xx$

$+ V_d = xx$

① $V_f = xx$

EBIT	xx
- interest	(xx)
EBT	xx
- Tax	(xx)
PAT	xx

② $Ko = \frac{EBIT}{V_f} \times 100$ OR $\left(Ke \times \frac{V_e}{V_f} + Kd \times \frac{Kd}{V_f}\right)$



2. Traditional Approach

⇒ use of financial leverage increase value of firm to some extend as advocated by NI approach. However, beyond that level, use of leverage decrease the value of firm due to increase in expected rate of return for equity.

⇒ calculation same as NI approach.

3. Net operating Income (NOI) Approach

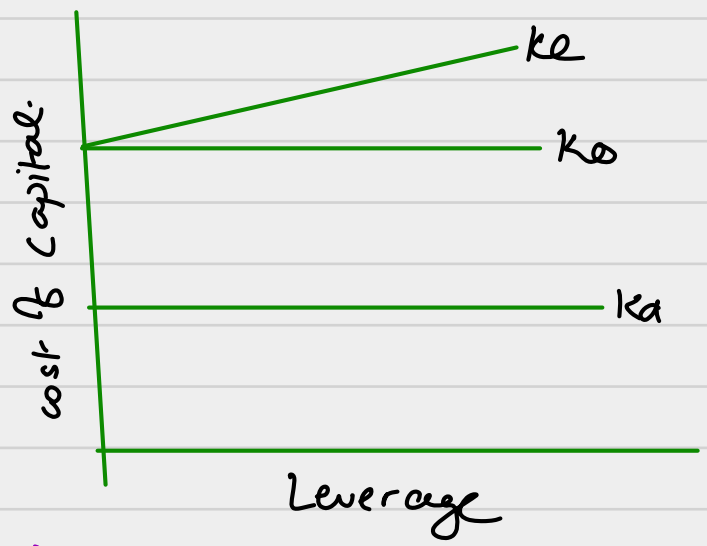
⇒ Capital structure decision does not impact value of firm. i,e FL ↑, Ke ↑, Ko becomes constant.

⇒ Ko will be given & constant and question will ask Ke & Ve.

$$V_f = \frac{EBIT}{K_o} = \infty$$

$$- V_d = \frac{\infty}{}$$

$$V_e = \frac{\infty}{}$$



$$K_e = \left(\frac{PAT}{V_e} \times 100\right) \text{ or, } \left(K_o = K_e \times \frac{V_e}{V_f} + K_d \times \frac{V_d}{V_f}\right)$$

4. Modigliani & miller Approach:-

⇒ Some concept as per NOI Approach, However it provides behavioural Justification for irrelevance of capital structure. This can be explain through Abitrage process.

Abitrage process:-

① sell shares of High value company & buy shares of low value company.

② Two ways to shows **Abitrage Process.**

1. Same Investment, some risk but Incremental Income.

1. Same return with low investment i/e relase of fund.

Particulars	Without - Tax	With - Tax
1. value of Unlevereg firm	$= \frac{EBIT}{Ke/Ko}$	$= \frac{EBIT(1-t)}{Ke/Ko}$
2. value of Levereged firm	Same as un Leverage	$= V_{UL} + D \times t$
3. cost of Equity of Levereg.	V_L xx $-V_D$ — ve xx $Ke = \left(\frac{PAT}{Ve} \times 100\right)$ OR $= K_{eu} + (K_{eu} - K_d) \times \frac{D}{E}$	V_L xx $-V_D$ xx ve xx $Ke = \left(\frac{PAT}{Ve} \times 100\right)$ OR $= K_{eu} + (K_{eu} - K_{dt}) \times \frac{D}{E}$

Trade-off Theory

⇒ It deals with balancing cost & benefit associated with fixed cost capital.

Fixed cost Capital

- **benefit**
  - * Interest - Tax shield
- **cost**
  - * cost of financial distress.
    - **Ruine**
      - * Reconstruction
      - * Requires additional cost.
    - **Insolvent**
      - * Insolvency cost (com may have to sell asses at lower cost.

Pecking Theory

⇒ based on asymmetric Information i/e different person may have different information. However, financial manager has better information than other.

Manager's choice of Capital

1. Internal financing (RE)
2. Debt Capital (Secured / unsecured / Hybid) i/e RoCE > Kdt
3. External Equity:- High cost Capital due to High Risk.

2. EBIT- EPS- MP Analysis:-

$$\rightarrow \quad EPS = \frac{[EBIT - Interest](1-t) - PD}{\text{No. of Equity shares.}}$$

Conclusion:- If other things ramains constant, there is direct relation between EBIT & EPS i/e Higher the EBIT, Higher will be EPS & vice-versa.

→ mp = EPS x P/E

Conclusion:- If P/E ratio is constant, Higher the EPS Higher will be mp of shares & vice-versa.

→ Optimum Capital Structure.

a. That maximizes shareholder's wealth (i,e mp)
b. If P/E not given, decision should be based on maximizing EPS.

where,

$$EPS = \frac{EAE}{\text{No. of Equity shares}}$$

MP = EPS x P/E Ratio.

Eg:-

EBIT = 40% of Capital, Tax = 30%

Capital structure	option-I	option-II	option-III
Equity	1000	800	500
10% Debt	-	200	300
20% PSC	-	-	200
	1000	1000	1000
P/E Ratio	12	10	9

Particular	I	II	III
EBIT	400	400	400
- interest @ 10%	-	20	30
EBT	400	380	370
- Tax @ 30%	120	114	111
PAT	280	266	259
- Preference Dividend	-	-	40
(a) EAE	280	266	219
(b) ÷ No. of shares	100	80	50
(c) EPS (a/b)	2.8	3.325	4.38
(d) P/E Ratio (given)	12	10	9
(e) mp (c x d)	33.6	33.25	39.42

Conclusion:- Since mp in case-III is highest, it should be selected.

3. Financial Break-Even & EBIT-Indifference.

Financial Break-even

⇒ Level of EBIT required to meet all financial fixed cost. i,e

at this EBIT, EPS = 0

financial break-even

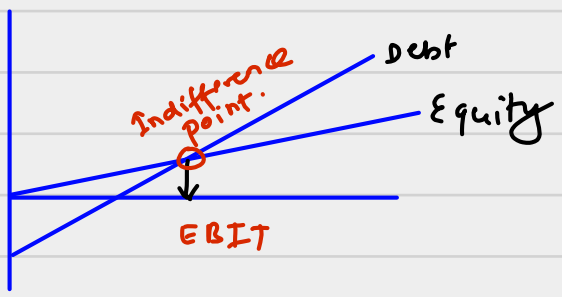
$$= \text{Interest} + \frac{PD}{(1-t)}$$

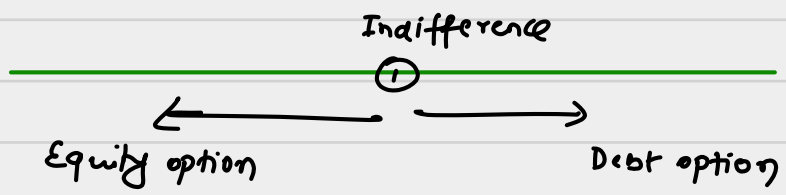
EBIT- Indifference Point.

⇒ Level of EBIT where, Eps under 2 financial options are same.
i,e

$$EPS_1 = EPS_2$$

or, $$\frac{(EBIT - I_1)(1-t) - PD}{\text{No. of Equity shares}_1} = \frac{(EBIT - I_2)(1-t) - PP_2}{\text{No. of Eq. shares}_2}$$





Chapter:- Dividend Decisions.

Practical

* Theories in dividend policy
1. Traditional model
2. Walter model
3. Gordon model
4. MM model
5. Linter model

Theoretical

1. Dividend vs. Buyback
2. Factors affecting dividend policy.
3. Dividend policy in practice.

other Residual

1. Right shares
2. Bonus shares
3. share split.
4. Reverse split

Does dividend policy impact share price?

- **No** → MM model
- **Yes.** → what is Impact?
  - **positive** → Traditional model.
  - → depends on ROE vs. Re
    1. Walter model
    2. Gorden model.

1. Traditional model:

Meaning:-	Based on proverb that "A bird in hand is better than 2 in bush" People like dividend which is certain compared to capital gain aring out of retain Earning — clearly uncertain.
Pricing	$P = m\left[D + \frac{E}{3}\right] \Rightarrow m\left[\frac{4}{3}D + \frac{R}{3}\right]$ Note:- m = firm multiplier
Conclusion:-	optimum Dividend policy is 100% pay-out.

2. Walter model.

a. Assumptions:-

→ Retain Earning is only source of finance
→ Return that company earn on new investment (i/e IRR/ROE/ROI) is known & constant.
→ Required rate of return of shareholders (Re/Ke/Kc) is known and constant.

b. Pricing Equation:-

$$P = \frac{D + (E-D)\times \frac{ROE}{Re}}{Re}$$

where,

$Re = \frac{1}{P/E}$

for 2 cases
→ g = 0
→ growth but ROE = Re

c. optimum Dividend policy:-

Case	Interpretation	Dividend policy
ROE > Re	Firm has positive NPV project. So, it should not pay dividend	pay-out → 0%
ROE < Re	Firm has negative NPV project. So, it should pay dividend.	pay-out → 100%
ROE = Re	Firm has zero NPV project. Dividend policy is irrelevance.	pay-out is irrelevance.

3 Gordon model:-

→ Assumptions & conclusions same as walter model.
→ pricing Equation: $P = \frac{D_1}{Re - g} \Rightarrow \frac{E_1(1-b)}{Re - br}$

Where as,

b = retaintion ratio of last year.

Note: $P_0 = \frac{D_0(1+g^{**})}{Re - g^{*}}$

** Sustainable Growth Rate (Next & subsequent)

* coming year growth Rate

4. Modigliani & Miller Model:-

9. Meaning:

→ Dividend policy is irrelevance because value of firm depends on earning ability not earning distribution ability.

→ Assumptions:-

* Investors are rational.
* No taxes
* No transcation cost
* Fully divisible shares
* short-selling is allowed.
* Corporate dividend & Home-made dividend are perfect substitute.

→ How investor makes home-made dividend.

Desired Dividend

- Excess Received ⇓ Invest in shares
- Short-fall ⇓ short. sell shares.

Pricing:-

I. $P_0 = \frac{D_1 + P_1}{1+Re}$

n = existing shares.

$\Rightarrow nP_0 = \frac{n(D_1 + P_1)}{1+Re}$ ⇒ value of Firm.

II. When firm makes New Investment:-

$mP_1 = I - [E - nD_1]$

where,

m = new shares to be issued

I = Investment

E = PAT

Note:- $nP_0 = \frac{(m+n)P_1 + E - I}{1+Re}$

5. Linter's model

⇒ As per this model, Dividend should be stable. Since, EPS of company changes, company should change pay-out ratio to maintain stable dividend

(i) If EPS is high, pay-out should be low.
(ii) If EPS is low, pay-out should be high.

$$D_t - D_{t-1} = c\left[r EPS_1 - D_{t-1}\right]$$

r = pay-out ratio
c = Adjustment factor.

B. Residual topics:-

1. Right shares:-

$$\text{Ex-Right price} = \frac{P_c \times n + E \times m}{n+m}$$

$$\text{value of Right} = \frac{P_c - E}{n+m} \text{ or, } \frac{P_E - E}{n}$$

] for having 1 share.

Chapter :- Investment Decisions.

Coverage:-

Basic Terms
1. Depriciation
2. Interest
3. CFAT
4. Initial Investment
5. terminal CF
6. Tax Effect.
7. Cost of Capital
8. Relevant Costing

Capital Budgeting Techniques
1. ARR
2. PBP & Discounted PBP.
3. NPV
4. PI.
5. IRR
6. modified IRR

Special cases
1. Cost information
2. Unequal life
3. Capital Rationing
4. Adjusted PV.
5. Replacement Decision.
6. Loan or Lease
7. Inflation in Capital Budgeting

⇒ Investment decisions means decision regarding investment in long-term assets in order to maximize shareholder's wealth.

1. Basic Terms:-

1. CFAT

Sales	xx
− VC	(xx)
Contribution	xx
− FC (including Depriciation)	(xx)
EBIT	xx
− Interest (ST)	(xx)
EBT	xx
− Tax	(xx)
EAT	xx
+ Dep	xx
CFAT	xx

CFAT

⇒ PAT + Dep + Interest (1−t)

⇒ [(SP − VC)Qty − FC − D](1−t) + Dep

⇒ [(SP − VC)×Q − FC](1−t) + DTS

2. Initial Investment (t0)

- LT Investment
- Investment in FA & working Capital

3. Terminal CF

1. Post-Tax SV:

SV	xx
− WDV	(xx)
Profit/loss	xx

① **Profit**

Tax payable = PNFit × TR

② **Loss**

Tax Saving = Loss × TR

Post-Tax SV = SV + Tax Siving − Tax payable

2. Working Capital Release

If invest at begining it will release at end & rice-versa.

If question is silent:-

① SV = NiL

② Working capital will always release.

Depriciation

⇒ does not involve any cash flow.

⇒ However, it saves tax.

CFAT

- If deducted, add back. ⇒ EBIT(1−t) + Dep
- If not deducted ⇒ EBDIT(1−t) + DTS

Interest

- **Long-term**
  - * Not to be deducted as expense.
  - * If deducted, add back Interest(1−t)
- **short-term**
  - * deduct as expense

Tax Implication

⇒ Every income has tax paying & expense has Tax Saving effect.

⇒ for DTS: Depriciation as per taxation.

⇒ **loss in CFAT** (It has tax saving effect)

① loss set-off with other project (CY)

② CF & set-off next year (Next year tax payable after loss set-off)

Cost of Capital

① Expectation of LT Source of Finance

② Minimum Return to main tain share price

Relevant Costing

① Sunk Cost :- Irrelevant for decision making. Eg. R&D, market survey, consultancy fee paid etc.

② opportunity cost :- Include in decision making.

③ Avoidable cost :- Relevant in decision making.

④ Allocated overhead :- Ignore for decision making.

Types of Decision

- Single project → Accept / Reject
- multiple project / mutually Exclussive → select best opportunity

1. Accounting / Average Rate of return :-

$$= \frac{\text{Average PAT}}{\text{Initial Investment}} \times 100$$

$$= \frac{\text{Avg. PAT}}{\text{Avg Investment}} \times 100$$

$$\text{Avg. Investment} = \frac{\text{Initial Investment} + SV}{2}$$

$$\text{Avg. PAT} = \frac{\text{Total profit}}{n}$$

Decision

① single project
ARR > Kc

② mutually exclussive
→ higher ARR

2. Pay back period (PBP) and DPBP

a. Pay-back period

→ uniform CF = $\frac{\text{Initial Investment}}{\text{CFAT}}$

→ Non-uniform CF = lower Range + $\frac{\text{Dificiency}}{\text{CFAT in upper Range}}$

for discounted PBP:- It covers cost of capital also. for discounted PBP, discounted CFAT & its cummulative shall be considered.

Decision:-

① Single project ⟶ PBP < management pre-determined rate.

② mutually exclussive ⟶ lower PBP

③ Net present value:-

Pv of inflow	xx
Less:- Pv of outflow	(xx)
NPV	xx

Decision:-

① Single project:-
⇒ NPV positive

② mutually Exclussive
⇒ Higher NPV.

Note:- Positive NPV increase shareholder's wealth.

$$\text{Increase in price} = \frac{NPV}{\text{No. of shares}}$$

Note-2:-

Inflow → CFAT
Inflow → post-Taxsv + wc

outflow ⇒ Initial investment → FA
Initial investment → WC

4. PI / PV Index / Benefit-cost Index / Desirability factor.

$$PI = \frac{\text{Pv of inflow}}{\text{Pv of outflow}}$$

So,

$$NPV = (PI - 1) \times \text{Initial investment}$$

⇒ It shows inflow per rupee of outflow.

Decision

① Single project ⟶ PI ≥ 1
② mutually exclussive ⟶ Higher PI

⑤ Internal Rate of Return:-

$$IRR = \text{lower rate} + \frac{NPV_{LR}}{NPV_{LR} - NPV_{HR}} \times (HR - LR)$$

⇒ It is actual rate of return on project. So, it is rate at which NPV = 0.

Decision:-

① single project ⟶ IRR > KC

② mutually excussive ⟶ Higher IRR.

How to estimate 2 rates

① Approx. PBP = $\frac{\text{outflow}}{\text{avg. CFAT}}$ $\left[\text{Avg. CFAT} = \frac{\text{Total CFAT}}{n}\right]$

② see Range of Approx PBP in table-II to find 2 discount rate.

⑤ Modified Rate of return:-

⇒ It is rate of compounding in a project.

Step-1 Calculate Fv of CFAT

Step2 Calculate Growth factor 'g' = $\frac{\text{Future value}}{\text{Initial outflow}}$

Step-3:- $MIRR = \sqrt[n]{g} - 1$

or, $(g)^{\frac{1}{n}} - 1$

Second Approach

In table -II, for life = n, find range of growth factor & corresponding 2 rate.

$$MIRR = LR + \frac{\text{Factor at LR}}{\text{Difference in factor}} \times (HR - LR)$$

Special Cases:-

1. **only cost information given:-**

⇒ select a project with minimum PV of all outflow

PV of outflow

Initial investment	xx
+ PV of post-Tax operating cost	xx
(-) PV of post-Tax SV	(xx)
	xx

PV of operating cost

year	OC(1-t) (2)	DTS (3)	Net (2-3)	PV
1	xx	xx	xx	xx
2	xx	xx	xx	xx
3	xx	xx	xx	xx

2. **Unequal life:-**

* Calculate Equivalent Annualized NPV & take decision based on it.

$$\text{Equivalent Annualized NPV} = \frac{\text{NPV}}{\text{PVAF}}$$

* If only cost information given.

$$\text{Equivalent Annualized Cost} = \frac{\text{PV of all outflow}}{\text{PVAF}}$$

(3) **Capital Rationing:-** If long term source of finance is not sufficient to finance all projects.

Project

- Divisible ⇓ PI basis.
- Not divisible ⇓ NPV basis

(4) **Adjusted PV:**

Adjusted PV = Base case NPV + PV of Interest-Tax shield. − Issue cost.

Base case NPV

⇒ NPV assuming project is equity finance.

i,e Base NPV = Pv of inflow at ke^* - Initial Investment

* $ke = Rf + (Rm - Rf) \times \beta$ (It is rate of return for equity shareholding assuming project is unlevered.)

* Pv of interest Tax shied = (Interes x Tax) xPVAF

* Adjected Discount Rate = $\frac{\text{Annual Income (for APV to '0')}}{\text{Fund}} \times 100$

* (Annual Income xPVAF) − Total fund = APV

(5) Replacement Decision.

a. Initial Investment

	cost of new machine	xx
+	working Capital	xx
(−)	post-Tax sv of old machine (at present)	(xx)
		xx

(b.) Incremental CFAT

	CFAT of new machine	xx
Less:-	" " old machine	(xx)
	Incremental CFAT	xx

(c) Terminal CF

	post-Tax sv of new machine	(at end)	xx
Less:-	" " " " old "	(at end)	(xx)
			xx

NPV = Pv of inflow - pv of outflow
= (Incremental CFAT xPVAF) + (sv x PVIf) - outflow

(6) Inflation in Capital Budgeting

cash flow

- nominal ⇒ discounted at nominal discount Rate.
- Real ⇒ discount at Real discount Rate

Note:- If CF given is real CF, assume discount rate is nominal & vice-versa.

2 methods of solution

① Convert real CF into nominal & discount at Nominal Rate

② Convert Nominal rate into real rate & discount real CF.

Note:-

① Nominal CF = Real CF (1 + Inflation)

② Nominal Rate = $(1 + K_c)(1 + \text{Inflation}) - 1$.

⑦ Buy or Lease

ⓐ Buy with bank loan

Years	Installment ⓐ	Int-Tax shield ⓑ	DIS ⓒ	Net CF (a-b-c)	Pv of CF
1	xx	xx	xx	xx	xx
2	xx	xx	xx	xx	xx
3	xx	xx	xx	xx	xx
					pv of outflow ⇒ xx

ⓑ Lease

Year	LR ⓐ	Tax saving ⓑ	Net CF (a-b)	Pv of CF
0	xx	-	xx	xx
1	xx	xx	xx	xx
2	xx	xx	xx	xx
3	-	xx	(xx)	xx
			pv of outflow	xx

Chapter- Working Capital Estimation

WC Decision
⇓
affects

liquidity — profitability

→ WC ↑, liquidity ↑, profitability ↓ and vice-versa.

→ It is necessary to trade off between liquidity and profitability while taking working capital decision.

Classification

Based on value

① Gross = Aggregate of CA.

② Net WC = CA - CL

Based on time

① Permanent:- Minimum level of investment in CA.

② Temporary:- Over and above permanent working capital.

Factors Affecting

→ Nature of industry
→ Type of product
→ Manufacturing vs. Trading vs. Service Industry.
→ volume of sale
→ credit policy.
→ Demand condition.

Approach

① Aggressive
② moderate.
③ conservative.

Working Capital Decision

Investment in Working Capital

Financing of working capital.

Working Capital Estimation

① Operating Cycle Approach

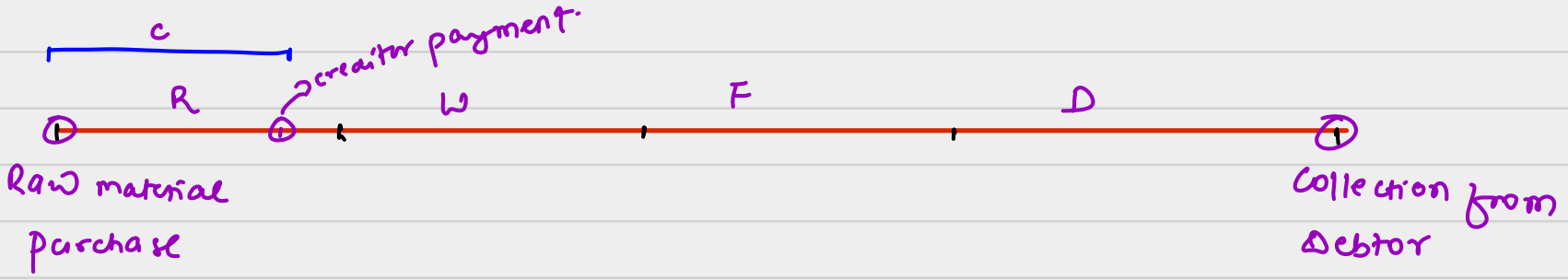
② Individual Component Approach

1. Operating cycle Approach:-

Working Capital Estimation = [Operating Cycle × (Cash operating Expense / 365)] + minimum cash balance

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

R = Raw material storage period
W = WIP conversion period
F = Finished good storage period
D = Debtor collection period
C = Creditor payment period.



Where,

R = Avg. Inventory of raw material / Avg. Raw material consumption per day.

$$W = \frac{\text{Avg. stock of WIP}}{\text{Avg. COP per day}}$$

$$F = \frac{\text{Avg stock of Finishedgoods}}{\text{Avg. COGS per day}}$$

$$D = \frac{\text{Avg. Debtor}}{\text{Avg. credit sale per day}}$$

$$C = \frac{\text{Avg. creditor}}{\text{Avg credit purchase per day}}$$

2. **Individual Component Approach**

9. **Computation of total cost**

opening stock of raw material	xx
+ purchase	xx
- closing stock of raw material	(xx)
Raw material consumed	xx
+ Direct Labour	xx
+ Direct Expense	xx
+ Manufacturing overhead	xx
Gross factory cost	xx
+ Opening stock of WIP	xx
(-) Closing " " "	(xx)
Factory cost	xx → WIP
+ AOH (related to production)	xx
Cost of production	xx
+ opening stock of finished goods	xx
(-) closing " " "	(xx)
COGS	xx → Finished goods
+ selling & distribution overhead	xx
COS	xx → Debtor

Note:- If question is silent following assumptions are made:-

① opening stock of RM, WIP, FG = closing stock of RM, WIP, FG

so,

RM consumption = RM purchase

Gross factory cost = Factory cost

cost of production = COGS

Example:

Given,

Ke = 5% + Risk Premium = 9%, Outflow = 20,000

Therefore, Rf = $\frac{1.16}{1.09} - 1 = 6.42\%$

Year	Expected CF	CEC (1 – 0.1 t)	Certain CF	PV @ 6.42%
1	10,000	1-.01 x 1 = 0.9	9,000	8,457.05
2	12,000	0.8	9,600	8476.65
3	14,000	0.7	9,800	8131.23
				25,064.94

NPV = 25,064.94 – 20,000 = 5064.94

Interpretation:

② Administrative overhead is general administrative overhead.

CEC – Alpha (α)

Alpha is a feeling of mind. It is affected by two factors.

✓ ~~Higher the risk, lower the alpha:~~

We are risk averse. If CFs are more risky we are afraid and ready to compromise and demand lower alpha.

Eg:-

Year	A	B
1	0.8	0.95
2	0.7	0.85

Project A is more risky as it has lower alpha.

Estimation of working capital

Particulars	₹
1. Current Assets	
a. Raw material $\left[\frac{\text{Raw material consumed}}{365} \times \text{RMP}\right]$	xx
b. WIP	
- material $\left[\frac{\text{Raw material consumed} \times \text{WMP}}{365}\right] \times$ % completion	xx
- Lab & OH $\left[\frac{(\text{labour + overhead}) \times \text{WHP}}{365}\right] \times$ %	
c. Finished Goods $\left[\frac{\text{COGS}}{365} \times \text{FHP}\right]$	xx
d. Debtor $\left[\frac{\text{cos}}{365} \times$ % of credit sale$\right] \times$ DCP	xx
e. Minimum cash balance	xx
f. Prepaid Expense	xx
	xx
2. Current liabilities	
a. Creditor $\left[\frac{\text{Rm purchase}}{365} \times \text{CPP}\right] \times$ % of credit purchase	xx
b. O/s expense $\left[\frac{\text{expense}}{365} \times \text{O/S period}\right]$	xx
	xx
Net working capital (1-2)	xx
+ margin	xx
Gross working capital	xx

Note-1 Debtor

- at sale
- at cost of sale *Ipt

2 approach

- Cash cost approach *Ipt (excluding appriciation)
- Total cost approach

Chapter :- Receivable management

management of Receivable
→ Evaluation of credit policy
① Total Approach
② Incremental Approach

financing of Receivable
① Pledge
② Factoring

1. Evaluation of credit policy :-

		Present	P_1	P_2
	credit sale	xx	xx	xx
Less:-	Cost			
	-VC	xx	xx	xx
	-FC	xx	xx	xx
Less:	① Bad debt	xx	xx	xx
	② Cash discount	xx	xx	xx
	③ Administrative cost	xx	xx	xx
	PBT	xx	xx	xx
Less:-	Tax	xx	xx	xx
	PAT			
Less:-	Opportunity cost	xx	xx	xx
	[cost of credit sale × collection period × ROI / 365]			
	Net Benefit	xx	xx	xx

Note:- ROI → After Tax return on investment

Incremental Approach

		Present	P_1	P_2
credit sale		xx	xx	xx
Incremental sale		—	xx	xx
Less :- Incremental cost				
- VC		VC	xx	xx
- FC		FC	—	—
Incremental	Bad debt	-	xx	xx
"	cash discount	—	xx	xx
"	Administrative exp	—	xx	xx

	Incremental PBT	—	xx	xx
Less:-	Tax	—	(xx)	(xx)
	Incremental PAT	—	xx	xx
Less:-	opportunity cost (Note)	—	xx	xx
	Incremental Benefit		xx	xx

Note:- Opportunity cost on incremental Receivable

	Present	P1	P2
Receivable [cos x collection period / 360]	xx	xx	xx
Incremental Receivable	—	xx	xx
Opportunity cost [Incremental Receivable x ROI]	—	xx	xx

2. Financing of Receivable

- Cost/Benefit of factoring
- Effective cost of factoring.

1. Cost / Benefit

Saving in Bad debt	xx
+ Saving in Administrative cost	xx
+ Saving in cost of Fund (Note-1)	xx
Less:- commission	(xx)
	xx

Note-1 Saving in cost of Fund

2 reasons

- Decrease in Receivable: [credit sales Yearly x (90 - 60)/360 x ROI]
- Decrease in cost of funding: [credit sale x collection period x (8% - 6%)]

2. Effective cost of Factoring

$$= \left[\frac{\text{Net cost}}{\text{Fund Raised}} \times 100 \times \frac{n}{3m} \right] \rightarrow 4$$

a. Fund Raised

Receivable
[credit sale × $\frac{\text{Collection Period}}{365}$] — xx

(−) Reserve — on Receivable — xx
(−) Upfront commission — on Receivable — xx

xx

Advance

(−) Interest upfront
[Advance × Rate × $\frac{DCP}{365}$] — xx

Fund Raised ⇒ xx

b. Net cost (3m)

a. Commission — xx
b. Interest — xx

xx

Less:- Saving
- Bad debt — xx
- Administration — xx
- Interest on WC from outside — xx

xx

a. Commission → Upfront → paid at beginning
→ Arrear → paid at end

b. Factoring → Recourse → Firm will bear bad debt.
→ Non-resource → factor " " " .

3. Credit Period

2/10 net 45 ⇒ pay within 10 days → 2% discount
After 10 days but max 45 day → No discount

Decision

PP = 100
pay = 15 days
loan = 15%

Discount
= 100 × 2% ⇒ 2

cost of early payment
= 100 × 15% × 5/365 ⇒ 0.21

Net saving = 2 − 0.21 ⇒ ₹ 0.79

max days to pay to avoid Interest

① 45 days
② $\frac{\text{No. of days}}{365} \times 15\% \times 100 = 1.79$
⇒ 44 days

payment ⇒ 44 days.

Chapter :- Cash management

⇒ Management of cash in such a way that there is sufficient liquidity and No surplus cash available with firm.

Techniques

1. Cash Budget
2. William J. Baumol EOQ model
3. Miller-orr cash management
4. Management of float
5. Accelerating Cash collection
6. Management of marketable securities

1. Cash Budget

3 Approach — ① Receipt & payment
② Balance sheet Approach.
③ P/L Approach

Receipt & payment Approach.

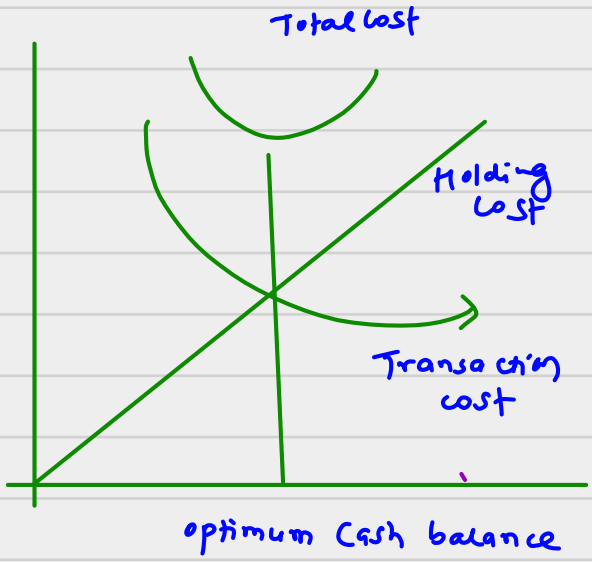
Particulars	April	May	June
Opening Cash	xx	xx	xx
Add:- Receipt			
① cash sale	xx	xx	xx
② Collection	xx	xx	xx
③ other income	xx	xx	xx
④ Sale of FA / Investment	xx	xx	xx
Less:- Payment			
① Cash purchase	xx	xx	xx
② payment to creditor	xx	xx	xx
③ Cash Expense	xx	xx	xx
④ Fixed Assets purchase	xx	xx	xx
⑤ Tax payment	xx	xx	xx
Closing cash balance *	xx	xx	xx

* Deficiency → Arrange BOD
Surplus → Invest in ST securities

2. Willian J. Baumol

Optimum cash holding

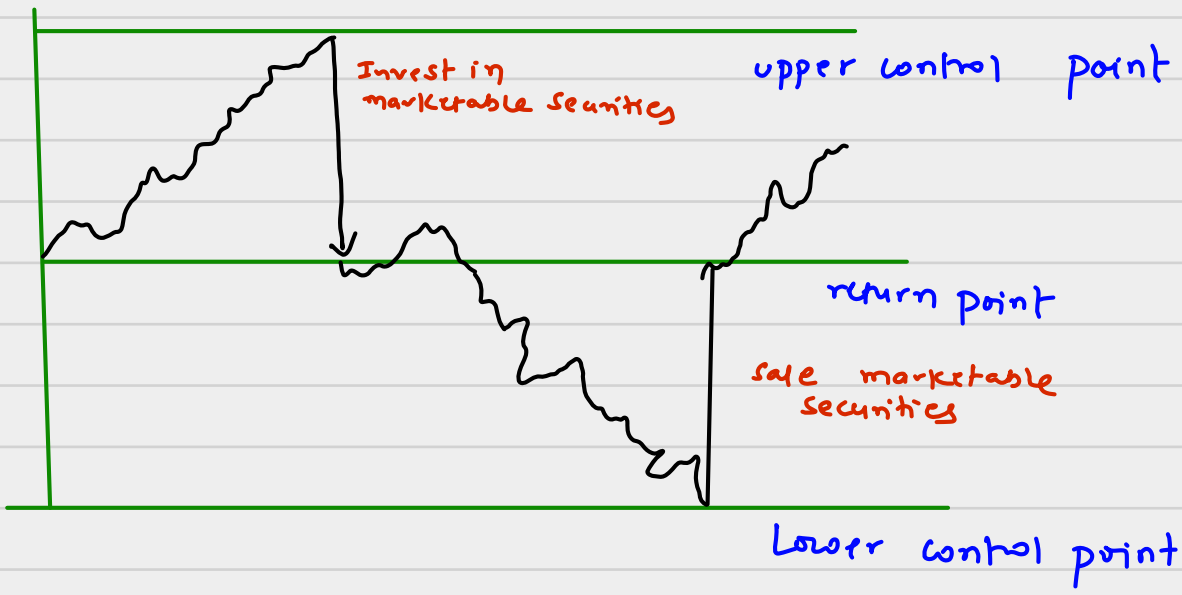
Holding cost	Transaction cost
a. on Average cash holding	a. Fixed per transaction
b. Per Rupee of cash i,e for ₹1 p.a.	b. Lot size (withdrawal) decrease, No. of transaction Increase, Transaction cost will increase
c. Lot size Increase, Average cash holding increase	



$$\text{optimum cash balance} = \sqrt{\frac{2AT}{i}}$$

A = Annual cash requirement
T = Transaction cost per transaction (withdrawal)
i = Interest cost (carrying cost per rupee p.a)

3. Miller- orr Cash Management



Lower limit = management perception.

Upper limit = lower limit + spread

Return point = lower point + $\frac{1}{3}$ x Spread

$$\text{Spread} = 3 \times \left(\frac{\frac{3}{4} \times \text{transaction cost} \times \text{variance of CF}}{\text{Interest Rate}} \right)^{1/3}$$