2. Dividend Decisions & Theories

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Dividend Models

Relevant

Effects share price & Value of firm

- Walters model
- Gordon model
- Graham & Dodd model

Irrelevant

Doesn't affect share price & value of firm

- Modigliani & Miller Approach
- Residual Approach
- Dividend discount model
- John Linter Model

Walter's Model

$$P = \frac{D + \frac{r}{k_e}(E-D)}{k_e}$$

where

D = Dividend per share
P = Market price per share
E = Earnings per share
r = Internal rate of return on investments
k_e = cost of capital / capitalisation rate

If

$r > k_e$; Optimal Divi. P/out ratio - 0%
$r < k_e$; O.D. P/out ratio - 100%
$r = k_e$; O.D. P/out ratio - Nil

Gordon Model

$$P = \frac{Y(1-b)}{k_e - br} \; ; \; k_e > g$$

where

P = Market Price per share
Y = Earnings per share
b = Retention ratio
1-b = Payout ratio
br = Growth rate
r = Return on investment rate
k_e = cost of equity / capitalisation rate

Dividend Payout ratio = $\frac{\text{Dividend Paid P.S}}{\text{Total Earnings P.S}} \times 100$

$D.P.S = \frac{\text{Dividend Paid}}{\text{No. of shares}}$

$E.P.S = \frac{\text{Earnings}}{\text{No. of shares}}$; $r = \frac{\text{Earnings}}{\text{Equity}} \times 100$

Graham & Dodd Model

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

Where;

P = Market price per share
m = multiplier
D = Dividend price per share
E = Earnings per share
$K_e = \frac{1}{\text{Price earnings ratio}}$

P.E ratio = $\frac{MPS}{EPS} \times 100$

John Linter's Model

$$D_1 = D_0 + \left([E \cdot P \cdot S \times \text{Target Payout}] - D_0\right) \times A \cdot F$$

Where;

D_0 = Dividend in Yr-'0'
D_1 = Dividend in Yr-'1'
EPS = Earnings per share
A.F = Adjustment factor
T.P = Target Payout Ratio

Modigliani & Miller dividend approach

Investment

- Retained earnings → Earnings - Dividend Paid → $E - (n \cdot D_1)$
- Fresh issue of shares → $m \cdot P_1$

$$I = E - (n \cdot D_1) + m \cdot P_1$$

No. of New shares to be issued (m)

i) When dividend declared

$$m = \frac{I - E + D}{P_1}$$

Where; I = Total Investment
E = Earnings
D = Total Dividend on Existing shares
P_1 = Expected price @ end of Yr-'1'

Value of Current Market price of share (P_0)

i) When dividend declared

$$P_0 = \frac{D_1 + P_1}{1 + K_e}$$

where,
D_1 = Present value of Expected dividend @ end of Yr-'1'
P_1 = P.V of share price @ end of Yr-'1'
K_e = cost of equity

Market Capitalisation

Value of firm => M.M approach

i) $n \cdot P_0 = \frac{n_1 D_1 + m P_1}{1 + K_e}$; $n \cdot P_0 = \frac{n P_1 - I + E + m P_1}{1 + K_e}$

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

Where;

n = No. of shares O/s at begin
mP_1 = New money raised to bridge the shortage
I = Total Invst amt req'
E = Earnings of net Inv

(or)

a) Net Income		XXX
b) Dividend payment		(XX)
c) Retained Earnings	(a-b)	XXX
d) Investment required		XX
e) Amt raised through fresh issue	(d-c)	XXX
f) No. of shares to be issued	$\left(\frac{e}{P_1}\right)$	XX
g) No. of shares O/s	(Present shares + f)	XX
f) Market Capitalisation	(g × P_1)	XXX

Dividend Discount Model

- **Zero growth** → There is constant dividend → $P_0 = \frac{D}{K_e}$ → $\frac{D_1 + P_1}{1+K_e}$
- **Constant growth** → There is constant growth in the dividend → $P_0 = \frac{D_1}{K_e - g}$ (Gordon's Model) → $[D_0(1+g)]$
  - Where; $g = b \times r$
- **Variable growth** → There is variable growth in the dividend → P.V of future dividends + P.V of dividend using Gordon model at end of 'n' of variable growth.

Intrinsic value of share:

Intrinsic value = Sum of P.V of future cash flows

(or)

= Sum of P.V of Dividends + P.V of stock sale price

$$\text{Stock Intrinsic Value} = \frac{D_1}{(1+K_e)^1} + \frac{D_2}{(1+K_e)^2} + \dots + \frac{D_n}{(1+K_e)^n} + \frac{R.V_n}{(1+K_e)^n}$$

Types of dividend

- **Cash dividend** → Paid in the form of cash
- **Share dividend (or) Stock dividend** → Paid in the form of bonus share
- **Property dividend** → Paid in the form of asset
- **Scrip dividend** → entity gives a promissory note
- **Liquidating dividend** → Total capital is repaid as liquidating dividend

Measures of Dividend Policy

- **Dividend Payout** = $\frac{\text{Dividends}}{\text{Earnings}}$
- **Dividend Yield** = $\frac{\text{Dividends}}{\text{Stock price}}$
- **Earnings Yield** = $\frac{\text{Earnings}}{\text{Stock price}}$

Residual Dividend Policy

Calculation:-

Step-1:- Calculate Net Profit = Total Revenue - All Expenses (incl. Tax & Int.)

Step-2:- Deduct Capital Expenses:- Subtract the capital expenditures (CAPEX) req^d for Invst projects & other essential expenses

Step-3:- Adjust for Debt & Int:- If the COY has debt obligations, adjust for req^d interest payments

Step-4:- Calculate Residual Amt:- = Net Pft - Capital Expenses - Interest

Step-5:- Determine Dividend Payout Ratio; it will determine the % of residual amt that will be distributed as dividends to S.H's.

Step-6:- Calculate the Dividend Amt:- Multiply the residual amt by dividend payout ratio to get the dividend amt that will be paid to S.H's

Step-7:- Retained Earnings:- The remaining % of residual amt (1 - dividend payout ratio) will be retained by COY for reinvestment & future growth

3. Leverage Analysis

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$$\text{Leverage} = \frac{\%\ \text{change in one variable}}{\%\ \text{change in some other variable}}$$

Types of Leverages

Operating Leverage (Business risk)	Financial Leverage (financial risk)	Combined Leverage (Total risk)
$O.L = \frac{\%\ \Delta \text{ in EBIT}}{\%\ \Delta \text{ in Sales}}$	$F.L = \frac{\%\ \Delta \text{ in E.P.S}}{\%\ \Delta \text{ in EBIT}}$	$C.L = \frac{\%\ \Delta \text{ in E.P.S}}{\%\ \Delta \text{ in sales}}$
$D.O.L = \frac{\text{Contribution}}{\text{EBIT}}$	$D.F.L = \frac{\text{EBIT}}{\text{EBT}}$	$D.C.L = \frac{\text{Contribution}}{\text{EBT}}$

Chart showing Operating, Financial and Combined Leverage

Profitability Statement	Amount(₹)	
Sales	XXX	
(-) Variable cost	(XX)	D.O.L
Contribution	XXX	
(-) Fixed cost	(XX)	
Operating Pft / EBIT	XXX	D.C.L
(-) Interest	(XX)	
Earnings before Tax	XXX	D.F.L
(-) Tax	(XX)	
Profit After Tax	XXX	
(-) Pref. Dividend (if any)	(XX)	
Earnings available to E.S.H	XXX	
÷ No. of E.S (N)	XX	
Earnings per share (EPS) = PAT / N	XXX	

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a) Asset Turnover Ratio
$= \frac{\text{Sales}}{\text{Total Assets}}$

b) Break Even Point
$= \frac{\text{Fixed cost}}{\text{contribution p.u / P.V ratio}}$

c) Margin of Safety
$= \frac{\text{Profit}}{\text{P/V ratio}}$
(or)
Total Sales - Break even sales

$D.O.L = \frac{\text{EBIT} + \text{Fixed cost}}{\text{EBIT}}$
(or)
$1 + \frac{\text{fixed cost}}{\text{EBIT}}$

Note:- operating leverage affects a firm's operating profit (EBIT)

d) Return on Invst
$ROI = \frac{\text{EBIT / EBT}}{\text{capital employed}} \times 100$

e) Capital T/o ratio
$= \frac{\text{Sales}}{\text{capital employed}}$

Capital employed
= Equity + Debt

Most commonly used measures of financial leverages

Debt ratio $= \frac{\text{Debt}}{\text{Total Capital (V)}}$
(or)
$= \frac{\text{Debt (D)}}{\text{Debt (D) + S.H's Equity}}$

Debt Equity ratio $= \frac{\text{Debt (D)}}{\text{S.H's Equity (E)}}$

Interest Coverage ratio $= \frac{\text{EBIT}}{\text{Interest}}$

4 Cost of Capital

Cost of Debt (Bonds, Debentures) [L.T]

Cost of Irredeemable Debt

$$K_d = \frac{Int \times (1-t)}{N.P}$$

Where
- K_d = Cost of debt after tax
- N.P = Net Proceeds
  - (Fair value − Discount + Premium − Flotation cost)
- t = tax rate

Cost of Redeemable Debt

$$K_d = \frac{Int \times (1-t) + \left(\frac{R.V - N.P}{N}\right)}{\left(\frac{R.V + N.P}{2}\right)}$$

where; R.V = Redemption value of debt
- N.P = Net Proceeds of issue
  - Gross Proceeds
  - (−) Issue expenses
- K_d = After tax COC
- t = tax rate
- N = No. of years of life

Preference Share Capital

Cost of Irredeemable "P.S"

$$K_p = \frac{\text{Preference dividend}}{\text{N.P of issue}}$$

Where;
- P.D = Preference dividend
- N.P = Net proceeds on issue of "P.S"

Cost of Redeemable "P.S"

$P_0(1+t)$

$$K_p = \frac{\text{Pref. dividend} + \left(\frac{R.V - N.P}{N}\right)}{\left(\frac{R.V + N.P}{2}\right)}$$

where; DT = Dividend tax
- P.D = Preference dividend
- R.V = Redemption value of "P.S"
- NP = Net proceeds on issue of "P.S"
- N = Life of "P.S"
- K_p = COC of "P.S"

Cost of Equity Share Capital

1. Dividend Yield / Price approach
2. Dividend growth approach / Gordon's Model
3. Earnings Price approach
4. Realised yield approach
5. Capital Asset Pricing Model (CAPM)

1) Dividend Yield / Price approach

$$K_e = \frac{\text{Dividend Per share}}{\text{Market Price per share}} = \frac{D_1}{P_0} \times 100$$

2) Dividend growth approach

$$K_e = \frac{D_1}{P_0} + g$$

Where; K_e = cost of "E.S.C" $= [P_0(1+g)]$
- D_1 = Net expected dividend
- P_0 = Current "M.P.S"
- g = Constant Growth rate of dividend

3) a) Earnings price approach

$$K_e = \frac{EPS}{MPS} \times 100$$

b) Earnings growth approach

$$K_e = \frac{EPS}{MPS} + g$$

4) Realised Yield approach

$$= \frac{D.P.S + (MPS_t - MPS_{t-1})}{MPS_{t-1}}$$

Where; D.P.S = Current Yr dividend
- MPS_t = Increase in MPS in one Yr.
- MPS_{t-1} = Last Yr MPS

(or)

$K_e = P.V_f \times D$

Where K_e = Cost of equity
- $P.V_f$ = Present value of disc factor
- D = Dividend per share

5) Capital Asset Pricing Model (CAPM)

$$K_e = R_f + \beta(R_m - R_f)$$

where; R_f = Risk free rate of return
- β = Beta coefficient by which market risk is determined
- R_m = Market rate of return
- $(R_m - R_f)$ = Market premium

Cost of Retained Earnings (K_r)

In absence of any information on personal tax (t_p)

→ Cost of retained earnings (K_r) = Cost of Equity Shares (K_e)

$$K_r = K_e$$

If there is any information on personal tax (t_p)

$$K_r = K_e - t_p$$

For purpose of cal^n of K_e: P = net proceeds realised = Issue price (−) floation cost

K_r: P = Current market price

$$K_r = K_e (1 - t_p) (1 - f)$$

Where, t_p = Personal tax or dividend tax
K_e = cost of equity
K_r = cost of retained earnings
f = Floatation cost like commission, brokerage, etc

Formulas used for cal^n of cost of "R.E" as well as for "COE" → (K_e)

Dividend Price Method

$$K_r = \frac{D}{P}$$

Earnings Price Method

$$K_r = \frac{EPS}{P}$$

Growth Method

$$K_r = \frac{D_1}{P_0} + g$$

Total Return

= cash payments received + Price change over period / Purchase price of asset

Total Return (%) = Dividend + Capital Gain / Initial Invest = $\frac{D_1 + (P_1 - P_0)}{P_0}$

Break even point

- Financial Break even point (F.B.E.P)
  - Level of EBIT at which EPS = 0
  - F.B.E.P = Int + Preferna dividend / 1 − t
- Operational Break even point (O.B.E.P)
  - Level of sales at which EBIT = 0
  - O.B.E.P = F.C / C.P.U or F.C / P.V.R
- Total Break Even point

As per CAPM risk is classified as

- Systematic risk (unavoidable / non-Diversifiable)
  - Market risk
  - Interest rate risk
  - Purchasing power risk
  - Eg: Inflation, Interest rate was recission
  - This systematic risk can't be avoided through diversification so, investor accept & except are addnl returned for taking this systematic risk
  - Beta is a measure of Systematic risk
- Unsystematic risk (avoidable)
  - Business risk
  - Financial risk
  - Default risk
  - Eg: completion business risk, operation risk
  - This is unsystematic risk can be avoided through diversification so this will be ignored

Cost of redeemable debt, if principal is paid in installments should be ascertained by

- Present value method / Internal rate of return (I·R·R)
  - Past performance
    - It is either physical asset or financial asset
      - The Relevant cash flows are as follows

Year	Cash Flows
0	Net proceeds in case of new issue / current market price in case of existing debt (N·P / P_0)
1 to n	Interest net of tax ($I(1-t)$)
n	Redemption value (R·V)

- Yield to maturity (YTM)
  - Future performance
    - Security investment yield be financial asset

Steps to calculate relevant cash flows:

Step-1: Identify the cash flows

Step-2: Calculate N·P·V's of cash flows as identified above using 2 discount rates (guessing).
Calculate I·R·R

Step-3:

$$I \cdot R \cdot R = L + \frac{N \cdot P \cdot V_L}{N \cdot P \cdot V_L - N \cdot P \cdot V_H}(H-L)$$ Where, L = Lower rate, H = Higher rate

Cost of Preference Share Capital (when dividend tax is considered)

- Redeemable P·S·C

$$K_p = \frac{D(1+D_t) + \frac{R \cdot V - N \cdot P}{n}}{\frac{R \cdot V + N \cdot P}{2}}$$

- Irredeemable "P·S·C"

$$K_p = \frac{D(1+D_t)}{N \cdot P}$$

where; D = Annual Preference dividend; K_p = cost of "P·S·C"
D_t = Dividend tax

Computation of Dividend Tax:

Tax on dividend	XXX
Add: Surcharge (to be cal' on tax on dividend)	XX
Add: Education cess (to be cal' on sum total of tax on dividend & surcharge)	XX
Add: Secondary & Higher Education cess (to be cal' on sum total of tax on dividend & surcharge)	XX
Dividend Tax (D_t)	XXX

Growth rate determination:- (R·R)

Case-1: Growth = Retention Ratio × Rate of return / return on Invst

R·R = Earnings available to "E·S·H" − Equity dividend

Case-2: Dividend given for 2 Yrs

$$G = \frac{D_1 - D_0}{D_0} \times 100$$

where, D_1 = Dividend @ end of year
D_0 = current dividend

Growth(g) = bxr

where, g = Future dividend growth rate

b = constant portion of retained earnings each "yr"

↓

b = Net Pft (after dividend paid) / Net Pft

r = Avg rate of return fund invested

↓

r = Net Profit / "B.V" of capital employed

Hence (g) = Net Pft (after dividend Paid) / "B.V" of capital employed

Net Proceeds (ie, funds received in the hands of company

If issue price is given and floation cost is given	If market price, floation cost are given	If issue price(old) current market price, floation cost are given	If New issue price, old issue price current "M.P", floation cost is given
↓	↓	↓	↓
N.P = I.P - Floation cost	N.P = M.P - Floation cost	N.P = M.P (-) floation cost	N.P = New I.P (-) floation cost

2) Debt includes debentures, bonds, & loans - so always consider tax shield on interest

5. Working Capital Management

Working Capital

- On the Basis of value
  - Gross working capital (Total CA)
  - Net working capital (CA-CL)
- On the Basis of Time
  - Permanent working capital → Fixed W.C
  - Temporary working capital → fluctuating W.C

- On the Basis of Total cost
- On the basis of cash cost

Rules for valuation of "W.C"

Particulars	Total cost Approach	Cash cost Approach
Raw material (RM)	Purchase Price (-) discounts	Purchase Price (-) discounts
W.I.P	R.M + 50% [D.L + D.E + POH]	R.M + 50% [D.L + D.E + POH excl. Dep^n]
F.G	Cost of Production [COP]	COP - dep^n & Pft
Debtors	selling Price "S.P"	"S.P" - dep^n
Creditors	Purchase Price (-) discounts	Purchase Price (-) discounts

Opportunity cost = Collection period (days) / 365 | 360 d × required rate of return / 100

Fixed working capital

It is the minimum amt of "W.C" required through out the life of project

This is financing through long term sources

Fluctuating W.C

It is the amt of "W.C" required over and above the fixed "W.C"

This is financing through short term sources

Estimation of "W.C"

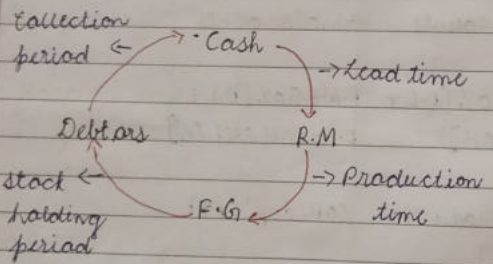
On the basis of operating cycle

On the basis of sales

Sales x %

On the basis of fixed assets

Fixed asset x %



Cash cycle = R.M C.P + W.I.P H.P + F.G. C.P + D.C.P − C.P.P

Material Turnover (in times) (M.T.R) = Cost of R.M consumed / cost of Avg stock

M.T.R (in days) = 365 days / M.T.R (in times)

Raw Material Conversion period

R.M.C.P = Cost of Avg R.M stock x 365 d / Cost of R.M consumed

Debtors Collection Period

R.C.P = Average Debtors / Annual Cr. Sales x 365 d

W.I.P Conversion period

W.I.P C.P = Avg W.I.P / Total COP x 365 d

Creditors Payment period

C.P.P = Average creditors / Annual Cr. purchases x 365 d

F.G Conversion period

F.G.C.P = Avg F.G stock / C.O.G.S x 365 d

No. of cash cycles in a year = No. of days in a year / cash cycle days

Average Working capital required = ~~No.~~ Operating Expenses / No. of cash cycles

Estimation of Current Assets:

1) R.M Inventory = Estimated prod^n (in units) x R.M cost p.u x Avg Inventory "H.P" / 12 M | 365 d

2) W.I.P Inventory

i) Estimated prod^n (in units) x R.M cost p.u x W.I.P H.P (month/days) x 100% / 12 M | 365 d

ii) Estimated prod^n (in units) x Labour cost p.u (or) E x W.I.P H.P (month/days) x 50% / O.H cost p.u / 12 M | 365 d

3 Finished Goods Inventory

= Estimated Prod^{n} (in units) × Manf. cost p.u × F.G. H.P (Month/days)
(or)
"COP"

12 M / 365 d.

4. Investment in Debtors.

= Budgeted Cr. sales × "CO.Sp.u (Excl. Dep^{n}) × Avg. "D.c.p" (Month/days)
12 M / 365 d.

5) Cash & Bank Balance

Estimation of Current Liabilities

1) Trade Creditors

= Budgeted Prod^{n} (in units) × R.M cost p.u × Cr. period allowed by creditors (months/days)
12 M / 365 d.

2) Direct Wages

= Budgeted Yrly Prod^{n} (in units) × D.L.C.p.u × Avg. time lag in payment of wages (months/days)
12 M / 365 d.

3) Overheads (other than Depreciation & Amortization):-

= Budgeted Yrly Prod^{n} (in units) × O.H.C.p.u × F.G.H.P (months/days)
12 M / 365 d

Determination of Working Capital

A	Particulars	Amt (₹)	Amt (₹)
A)	ESTIMATION OF CURRENT ASSETS		
	1) Raw materials		XXX
	2) W.I.P		
	a) Raw material	XXX	
	b) Work-In-Progress	XXX	
	c) Fixed O.H's	XXX	XXX
	3) Finished Goods		XXX
	4) Debtors		XXX
	5) Cash & bank balances		XXX
	6) Prepaid Expenses (if any)		XXX
	Total Current Assets (A)		XXXX
B)	Estimation of Current liabilities		
	1) Creditors	XXX	
	2) Wages	XXX	
	3) Overheads	XXX	
	4) Goods and Services Tax (GST)	XXX	XXX
	Total Current Liabilities (B)		XXX
C)	Net Working Capital (A-B)		XXX
	(+) Margin for contingencies (if any)		XXX
D)	Net Working Capital required		XXXX

Expected rate of return = Incremental expected Pft / incremental invst in receivables

→ Provision / Margin for contingencies can be maintained @ a% of gross "W.C" or as a % of Net "W.C"

Tandon Committee Norms

-> Tandon Committee introduced the concept of Maximum Permissible Banking Finance (M.P.B.F)
-> It is working capital limits likely to be approved by the banks

Methods	Formulas
Method - 1	MPBF = 0.75[(current assets - Current liabilities)]
Method - 2	MPBF = 0.75 (current assets) - Current liabilities
Method - 3	MPBF = 0.75 [(current assets - Core current assets) - Current liabilities

Inventory Model to cash MGT (Baumol Model)

$$C = \sqrt{\frac{2AF}{O}}$$

Where, C = Optimum cash balance
A = Annual cash disbursement or requirement
F = Fixed cost per transaction
O = opportunity cost of one rupee p.a/p.m or ROI on marketable securities

Miller - Orr Model

$$Z = \left[\frac{3}{4} \times \frac{Co^2}{K}\right]^{1/3}$$

Where, Z = Target cash bal' (optimum cash bal')
C = Transaction cost
σ^2 = Standard deviation of net cash flows
K = Interest rate

where, R = Return level = L+Z Spread = H-L (or) 3Z
H = Upper limit = 3Z+L / R+2Z
L = Lower limit

Average cash balance = $\frac{4R-L}{3}$ (or) $\frac{H+R+L}{3}$

Cash Discount Model

1) Benefit

Particulars	Before cash discount	After cash discount
Sales	XXXX	XXXX
(-) Variable cost (V.C)	(XXX)	(XXX)
(-) Fixed cost	(XXX)	(XXX)
(-) Bad debts	(XXX)	(XXX)
(-) Collection Expenses	(XXX)	(XXX)
(-) Administration Expenses	(XXX)	(XXX)
(-) Cash discount	-	(XXX)
Pft before Tax	XXXX	XXXX
(-) Tax	(XX)	(XX)
Pft after Tax	XXXX	XXXX

2) Opportunity cost (O.C)

Particulars	Present	Proposed
a) Investment in debtors	XXX	XXX
b) Opportunity cost [(a) x O.C (as a %) will be given in the problem]	XXX	XXX

3) Net Benefit

Particulars	Present	Proposed
Incremental Net benefit (A-B)	XXX	XXX

Investment in Debtors can be computed

a) Based on sales value c) Based on Variable cost

b) Based on Total cost

↓

$$\text{Sales / T.C (F.C+V.C) / V.C} \times \frac{\text{Debtors collection period}}{365\text{d / 12M / 52W}}$$

Decision: 1) If the net benefit is +ve, then accept Cash Disc proposal

2) Otherwise continue the existing credit policy

Management of Payables (Creditors)

When to avail cash Discount:

↓

The annual opportunity cost of foregoing cash discount can be calculated as follows

↓

$$\frac{\text{\% cash discount}}{100\% - \text{\% cash discount}} \times \frac{365\text{d}}{\text{credit period} - \text{Discount period}}$$

Decision: Avail cash discount (or do not avail credit) if the annual cost of foregoing cash discount is higher than the cost of other sources of credit, otherwise not.

Debtors Management ↷ (The treatment is same as treatment of cash discount model)

Credit policy

↓

Credit period

Cash discount

Decision:

1) If the net benefit is +ve then accept the proposed credit policy

2) Otherwise continue the existing credit policy

credit policy ↷ Total Sales (+) ××× (−) Opportunity cost (××)

(−) Total cost (××) Net Loss/Net Profit ××××

(−) Extra recurring cost (××)

(−) Bad debts (××)

Concentration banking & Lock box approach evaluation:

Step-1 :- Calculate Avg collection per day = $\frac{\text{Annual Cr. sales}}{365\text{d}}$

Step-2 :- Calculate Reduction in Mailing & Processing time

↓

= Existing Mailing and Processing time

(−) Mailing & processing time after introducing system

Step-3 :- Calculate Annual Interest saved as follows

↓

= Avg collection per day × Red^n in Mailing & processing time × ROI p.a (Interest)

Step-4 :- Calculate Annual cost of Concentration banking / Lock Box system

Step-5 :- Introduce the proposed system if annual interest saved (as per step-3), exceeds annual cost (as per step-4), otherwise not

Approaches to Working capital Invst

Point of difference	Aggressive	Moderate	Conservative
i) Cost	Low	Medium	High
ii) Risk	High	Medium	Low
iii) Profitability	High	Medium	Low
iv) Liquidity Problem	High	Medium	Low

Computation of Cost of credit or Payables

i) Cost of credit $= \left(\frac{d}{100-d} \times \frac{365\,d}{t}\right)$

where; d = Size of discount / discount (%)
t = Allowed payment days
(-) discount days

ii) The cost of lost cash discount $= \left(\frac{100}{100-d}\right)^{\frac{365}{t}} - 1$

Interest yield = $\frac{\text{Face value} - \text{Sale price}}{\text{Sale price}} \times \frac{360 \text{ days}}{\text{Days of maturity}}$

Goods and Services Tax (GST)

= Budgeted Yly. productions (in units) × GST per unit × Avg time lag in payment of GST (weeks / days) / 12 months / 365 days.

Return on total Assets (ROTA) = $\frac{EBIT}{\text{Total assets}}$

→ Return on total assets indicates the probability and the performance of the utilization of total assets.

Methods of cash management

- To maintain optimum level of cash balance
  - Baumol Model
    - EOQ model of cash management
  - Miller ORR Model
- To project the cash flows and planning
  - Cash budget

Format of Cash budget

Particulars	Month-1	Month-2	Month-3	Month-12
Receipts:				
1) Opening balance				
2) Collection from debtors				
3) Cash sales				
4) Sale of capital assets				
5) Loans received from banks				
6) Share capital - call money on shares				
7) Miscellaneous				
8) Other items of receipts				
Total (A)				
Payments:-				
1) Payment to creditors				
2) Cash purchases				
3) Wages & salaries				
4) Overheads a) b) c)				
5) Interest				
6) Dividends				
7) Loan repaid				
8) Corporate tax				
9) Capital expenditure				
10) other items				
Total (B)				
Closing balance (A-B)				
[Surplus (+) / Shortfall (-)]				

6. Financial Ratio Analysis

Ratios
- Solvency Ratios
- Turnover ratios
- Profitability ratios
- Market test ratios

Short term liquidity ratios

1) Current ratio (2:1) = Current Assets (C.A) / Current liabilities (C.L)

2) Quick Ratio (1:1) = Quick Assets / Current liabilities

i) Quick Assets = C.A - stock - Prepaid expense

ii) Quick liabilities = C.L - Bank O.D - Cash credit

3) Absolute cash ratio / cash ratio (1:2) = Bank + cash + Marketable securities / current liabilities (C.L)
(or)
= Bank + cash + current Investments / C.L

Long term capital structure

i) Leverage ratios (ii) Coverage

1) Debt ratio = Total Debt / Net assets or capital employed

2) Equity ratio = S.H's equity / Net assets / capital employed

3) Debt to Equity ratio = Total debt / S.H's equity
(or)
L.T debt / S.H funds

4) Debt to total assets ratio = Total debt / Total assets

5) Capital Gearing ratio = Fixed Int bearing funds / E.S.C + R&S - losses
(Debentures, LT loans, P.S.C)

6) Proprietary ratio = N.W / S.H funds / Total assets

ii) Coverage ratios

4) Cash to Total assets ratio = Cash + Marketable securities / Total assets

5) Working capital = Current assets - Current liabilities

5) Defensive interval ratio = cash + bank + debtors + marketable securities / Operating Expenses / 365
(or) "C.A" - prepaid Exp - Inventories / Daily operating Exp.

i) Daily operating Expenses = C.O.G.S + G&L Exp - Depreciation & other non-cash Expenses / 365 d

ii) Current assets = Inventories + T/R + Cash & bank bal + marketable securities + Advances to material suppliers + prepaid Exp + Advance I.T (in excess of provision)

iii) Current liabilities = Trade creditors + creditors for services + "S.T" loans + Bank O.D / cash credit + O/s Exp + Prov. for tax + proposed & Unclaimed dividend

1) Debt service / overall coverage ratio = Earnings available for debt service / Interest + Instalments

2) Interest coverage = EBIT / Interest

3) Pref. Dividend coverage ratio = Net Pft / P.B.T (→ Tax) / Pref. dividend

4) Fixed Charges coverage ratio = EBIT + depreciation / Interest + repayment of loan

i) Earnings available for debt service = NIP + Non-cash operating Exp like dep" & other amortization + non-operating adj's like loss on sale of "F.A" + Int on debt fund

ii) Net assets = Net "F.A" + "C.A" - C.L

iii) Capital employed = E.S.C + P.S.C + R&S + Debt funds (other than C.L) - Misc. Expenses not written off - Non-Trade Investments
(or)
= Total assets - Current liabilities

Turnover ratios

1) Total Asset T/o ratio
= Sales / COGS
Avg total assets

2) Fixed Assets T/o ratio
= Sales / C.O.G.S
F.A

3) Capital T/o ratio
= Sales
Avg. capital employed or net assets

4) Working capital T/o ratio
= Sales / C.O.G.S
Working capital

i) Inventory T/o ratio
= Sales / C.O.G.S
Avg inventory

a) R.M T/o ratio
= R.M consumed
Avg R.M stock

b) WIP T/o ratio
= Annual COP
Avg W.I.P

c) F.G T/o ratio
= Annual C.O.G.S (Sales - G.P)
Avg F.G

Profitability ratios based on sales

1) G.P ratio = Gross Pft / sales × 100

2) N.P ratio = Net Pft / sales × 100

3) Operating Pft ratio = operating Pft / sales × 100

Profitability ratios based on Expenses

1) COGS ratio = C.O.G.S / sales × 100

2) Operating Expense ratio
= Admin Exp + S&D.O.H / sales × 100

3) Operating ratio
= C.O.G.S + selling & operating Expenses / sales × 100

4) Financial Expenses ratio
= Financial expenses / sales × 100

ii) a) Debtors T/o ratio
= Credit sales / Avg. T/R

b) Debtor's Velocity
= Avg T/R / Avg daily Cr. sales

iii) a) Creditors T/o ratio
= Annual net Cr. Purchases / Avg T/P

b) Creditor's Velocity
= Avg T/P / Avg daily Cr. Purchases

Profitability ratios required for analysis from owner's point

1) E.P.S = N.P available for E.S.H / No. of "E.S" O/S

2) D.P.S = Dividend paid to E.S.H / No. of "E.S" O/S

3) Dividend payout ratio
= D.P.S / E.P.S × 100

Profitability ratios related to the overall return on assets / Investments

↓ N.P ratio × Asset T/o ratio

1) Return on Investment (ROI)
= Return / PAT / Investments (Avg capital) × 100

2) Return on Assets (ROA)
= PAT / Avg total assets × 100

3) Return on Capital Employed
ROCE (pre-tax)
= EBIT / capital employed × 100

4) Return on Capital employed
ROCE (post tax)
= EBIT (1-t) / capital employed × 100

5) Return on Equity (ROE)
= PAT - Pref. dividend / N.W / S.H's fund × 100

a) Dupont Model
ROE = N.P Margin × Asset T/o × Equity Multiplier

PAT / N.W = PAT / sales × sales / T.A × T.A / N.W

Profitability ratios related to Market test

1) Price Earnings per share (P/E ratio)
$= \frac{\text{Market price per share}}{\text{E·P·S}}$

2) Dividend yield
$= \frac{\text{D·P·S}}{\text{M·P·S}} \times 100$
(or)
$= \frac{\text{dividend} \pm \Delta \text{in share price}}{\text{initial share price}} \times 100$

3) Earnings Yield
$= \frac{\text{E·P·S}}{\text{M·P·S}} \times 100$

4) Market value to book value per share
$= \frac{\text{Market value per share}}{\text{book value per share}}$

5) Q ratio
$= \frac{\text{M·V of equity \& liabilities}}{\text{estimated replacement cost of assets}}$

6) N·P Margin
$= \frac{\text{Net income}}{\text{Revenue}}$

7) Asset T/o
$= \frac{\text{Revenue}}{\text{Assets}}$

Vertical Analysis
- This involves study of relationship b/w different items of "FS" for one particular year.

Eg: Cal^{l} G·P to sales ratio for the Yr

Horizontal Analysis
- This analysis involves comparison of financial data of the different yrs.

Eg: Comparison b/w G·P ratio for last 2 FY's.

Return on Equity $= \frac{\text{EBIT}}{\text{sales}} \times \frac{\text{sales}}{\text{N·A}} \times \frac{\text{PAT}}{\text{EBIT}} \times \frac{\text{N·A}}{\text{N·W}} = \frac{\text{PAT}}{\text{N·W}}$
(or)
= Return on "N·A" × Financial leverage (Inc·) × Financial leverage (B/S)

Trend % / Trend Ratio
$= \frac{\text{Value of each item is financial statement of any period}}{\text{Value of same item is financial statement of base period}} \times 100$

Income Statement

Particulars	Amt (₹)
Sales	XXX
(−) Variable Cost	(XX)
Contribution	XXX
(−) fixed cost	(XX)
EBIT	XXX
(−) Interest	(XX)
EBT	XXX
(−) Tax	(XX)
PAT	XXX
(−) Preference Dividend	(XX)
N·P for E·S·H	XXX
(−) Equity dividend	(XX)
Retained Earnings	XXX

Financial Analysis

Comparative Statement Analysis

Comparative Income statement — Comparative balance sheet

% change $= \frac{\text{Increasing/decreasing amt}}{\text{amt in past period}} \times 100$

Common size statement Analysis

Balance sheet → Assets / Liabilities
- It is classified in "F·A"/"C·A" & Invsts
- It is classified in proprietors fund, L·T loan (Same like assets)

$\frac{\text{Invst/"C·A"/"F·A"/ fictitious assets}}{\text{total assets}} \times 100$

Income statement (P&L A/c)
- It is cal^{l} in sales, COGS, operating exp, N·P, Int, tax

EAT, % of each element with sales

7. Capital Structure Theories

Capital Structure Theories

- Net Income approach
- Net operating income approach
- Traditional approach
- Modigliani & Miller hypothesis
- Trade-off theory
- Pecking order theory

Capital Structure Theories

Capital structure relevance theory

1) Net Income Approach

i) Market value of firm (V) = S + D

Where; V = Value of the firm
S = Market value of equity
D = Market value of debt

ii) Market value of equity (S) = $\frac{N.I}{K_e}$

Where, N.I = Earnings available for E.S.H
K_e = Equity capitalisation rate

iii) Overall cost of capital $K_o = \frac{EBIT}{\text{value of firm}}$

Capital structure irrelevance theory

1) Modigliani & Miller (MM) Approach (without tax)

i) Value of a levered firm (Debt to equity)
= Value of an unlevered firm + Tax benefit on debt (Debt × t%)

ii) Value of a Unlevered firm (equity) = $\frac{EBIT(1-T)}{K_e}$ (or) $\frac{EAES}{K_e}$

iii) Cost of equity in a levered firm (K_e)
= K_e of unlevered firm (+) (K_e of unlevered firm − K_d) × $\frac{Debt}{Equity}$

iv) WACC in a levered firm = $\frac{EBIT(1-T)}{\text{value of firm}}$

Capital Structure irrelevance

2) Net operating income approach

i) Market value of firm $V = S + D = \frac{NOI}{K_o}$

Where; V = Value of the firm
S = Market value of equity
D = Market value of debt
NOI = EBIT
K_o = Overall cost of capital

ii) Value of equity (S) = V(Market value of firm) − D(Market value of debt)

iii) Cost of equity (K_e) = $\frac{EBIT}{(V) - (D)}$

Capital Structure relevance theory

2) Modigliani & Miller (MM) Approach with tax

Cost of Equity (K_e) = WACC + Risk premium

(or)

$K_e = K_o + \frac{Debt}{Equity}(K_o - K_d)$

3) Traditional approach

i) Market value of debt (D) = $\frac{\text{Interest}}{K_d}$

ii) Market value of equity (S) = $\frac{N.I}{K_e}$

$\boxed{V = S + D}$

iii) Overall cost of capital = $\frac{EBIT}{\text{value of firm}}$

Different Phases of Traditional Theory

Phase	I	II	III
K_d	Constant	Constant	Increases gradually
K_e	Constant	Increases	Increases faster than K_d
K_o	Declines	Declines & may remain constant	Increases
Reason for K_o movement	Low-cost K_d pulls down K_o	Advantage of low-cost K_d is set-off by increase in K_e	K_d & K_e both increase causing K_o to increase

EBIT - EPS - Analysis

→ Optimal capital structure using EBIT - EPS analysis is that capital structure at which EPS will be maximum

EBIT (operating Income before tax)

EBIT	EBIT	EBIT
	= TCE X ROCE	=
Sales	[Total capital employed	EBT + Interest
(-) Variable cost	X Rate of return on	
Contribution	capital employed]	
(-) Fixed cost	↓	
EBIT	ROCE = EBIT / Total capital employed	

Indifference point / EPS equivalent point

→ It is the level of EBIT at which EPS will be same under two difference capital structure financial planning

→ If expected EBIT > Indifference point = Procure funds / C.S / High proportion of debt

→ If expected EBIT < Indifference point → Lower proportion of debt / Go for equity.

→ This rule / principle applies when $K_d < ROR$ (financial leverage)

Indifference point, under two financial plans.

Alt-1, Say, with Debt

$$\frac{(EBIT - Int_1)(100 - Tax\ rate) - P.D_1}{N_1}$$

EPS of 2 options

= Equal EPS under both options.

Alt-2 :- Say, No Debt

$$= \frac{(EBIT - Int_2)(100 - Tax\ rate) - PD_2}{N_2}$$

EBIT = NOI - Int = Net Inc. or E.B. earning

where; Int_1 = Interest under financial plan-(1); $P.D_1, PD_2$ = Pref. dividend
Int_2 = Interest under financial plan-(2); N_1, N_2 = No of "E.S"

Note:-

Difference b/w levered & unlevered firm as per M.M with approach is tax benefit on [Interest on Debt]

Tax shield on Int on debt = Debt X Tax rate
X Int rate X Tax rate

P.V of all this tax shield = Perpetual C.F / r

P.V of perpetuity = Debt X Int rate X tax / r (Interest rate)

Pecking order Theory	Trade-off Theory
1) Internal financing	1) Debt
2) Debt	2) Equity
3) Equity	

Optimal Capital Structure [EBIT - EPS analysis]

→ The objective of this analysis is to find the EBIT level that will equate EPS regardless of financing plan chosen

→ Capital mix at which K_o is minimum is the optimal "C.S" ie; at this capital mix value of firm will be maximum.

8. Capital Budgeting (Investment decisions)

Capital Budgeting Techniques

A) Traditional / Non-discounting

1) Accounting Rate of return (ARR)

Version-1: Original Invst basis

$$ARR = \frac{\text{Avg PAT p.a}}{\text{Net investment}} \times 100$$

Where,

i) Net Invst = Initial Invst (+) Salvage value

ii) PAT = CFAT - Depreciation

iii) Avg PAT p.a = Total PAT during Project life / No of Yrs of project life

Version-2: Average Invst basis

$$ARR = \frac{\text{Avg Invst PAT p.a}}{\text{Avg Invst in project}} \times 100$$

Where,

Avg investment = $\frac{1}{2}$ (Initial cost + Installation Exp - Salvage value) + Salvage value + working capital

B) Time adjusted / Discounted "C.F" techniques

1) Net Present value Method

N.P.V = Total Discounted cash flow after tax [DCFAT] (−) Initial investment

Where,

DCFAT = Cash flows after tax (CFAT) × Discounting factor (D.F)

(or)

Total Discounted cash inflows (−) Total Discounted cash outflows

Decision Rule:

Single Project	Multiple projects	
	Mutually independent	Mutually exclusive
NPV > 0 - Accept	Accept all the projects whose NPV is positive	Accept the project with the highest NPV
NPV < 0 - Reject		
NPV = 0 - Accept / reject		

Version-3: Annual rate of return

Decision rule:

Single project	Multiple projects
ARR > COC - Accept	1) Mutually independent: Accept all the projects whose ARR > COC
ARR < COC - Reject	
ARR = COC - Accept / reject	

COC: Cost of capital

2) Mutually exclusive: Accept the project with highest ARR

Key terms:

1) Average investment = $\frac{\text{opening Invst + working capital} + \text{closing Invst + working capital}}{2}$

2) Annual Investment basis: It is average of ARR of all years.

2) Profitability Index method

$$P.I = \frac{\text{Total DCFAT [CFAT} \times \text{PVIFA]}}{\text{Initial Investment}}$$

(or)

$$P.I = \frac{\text{sum of discounted cash inflows}}{\text{sum of discounted cash outflows}}$$

Decision rule

Single Project	Multiple projects	
	Mutually independent	Mutually exclusive
PI > 1 - Accept	Accept all the projects whose PI > 1	Accept the project with highest PI
PI < 1 - Reject		
P.I = 0 - Accept / reject		

3) Discounting Payback period

i) When cash flows are uniform

$$DPBP = \frac{\text{Total investment}}{\text{Discounted annual cash inflows}}$$

ii) When cash flows are not uniform

$$DPBP = \text{Yr before the DPBP occurs} + \frac{\text{Cumulative C.F in a Yr before recovery}}{\text{Discounted C.F in the Yr after recovery}}$$

Decision:-

In the D.P.B.P method, a project is acceptable if the discounted payback < target payback period

A)-2) Payback Period

When the net cash flows are uniform →

P.B.P = Initial investment / Annual cash inflow / CFAT p.a

When cash flows are not uniform →

P.B.P =

Years before fully recovering the cost + Unrecovered cost at the start of final yr to recover the Invst cost / Annual net CF of final Yr to recover the invst cost

A-3) Pay back reciprocal

= Avg Annual Net CFAT / Initial investment

= 1 / Pay back period

* Higher the payback reciprocal, better is the project.

The payback reciprocal is considered to be an approximation of IRR if-

i) The life of project is atleast twice the payback period &

ii) The project generates equal amt of annual cash inflows

B)-4) Internal rate of return

Scenario-1 :- For an investment with single cash flow

Step - 1 :- Future value = P.V x F.V.F ($FVF = \frac{F.V}{P.V}$)

Step - 2 :- Trace the rate of interest corresponding to x no. of yrs

Scenario-2 :- For an investment with uniform cash flows over its life

Step - 1 :- Here we got multiple inflows.

W.K.T, at IRR, N.P.V = 0

Present value of inflows = P.V of outflows

Periodic cash flow x P.V.A.F = P.V of outflows.

PVAF = P.V of outflows / periodic cash flows

Step - 2 :- Trace the interest rate using PVAF table.

Scenario-3 :- For an investment without uniform C.F's over its life

i) Trail & Error method :

-> Assume one guess rate and calculate N.P.V at that 1st guess rate

-> Assume another guess rate calculate N.P.V at the 2nd guess rate (If N.P.V becomes zero in step itself, no need to come to step-b)

-> Continue till you get N.P.V = 0

-> The only problem with this method that it is based on trial & error approach.

ii) Interpolation :- $IRR = LR + \frac{NPV \text{ at } LR}{NPV \text{ at } LR - NPV \text{ at } HR} \times (HR - LR)$

Scenario-4 :- For an Invst with infinite uniform cash flows over its life (perpetuity)

$IRR = \frac{\text{Perpetuity}}{\text{Initial outlay}} \times 100$

Decision rule

Single project

IRR > COC - Accept

IRR < COC - Reject

IRR = COC - Accept / reject

Multiple projects

Mutually independent → Accept all the projects whose IRR > COC

Mutually exclusive → Accept the project with higher IRR.

Analysis of Cash flows

- Cash out flows
  - Investment towards "FA" & working capital
    - → Cost of asset
    - → Working capital
- Cash in-flows
  - Operating Cash inflows
    - These are recurring in nature also known as CFAT
  - Terminal Cash inflows
    - One time cash inflow received at the end of project life
      - Net sales, Pft from sale of asset, recovery of working capital

Step-1: Estimation of Cash outflow (Cost):

a) Cost of Asset	XXXX
b) Add: Installation cost	XXX
c) Add: Working capital requirement	XXX
d) Less: Subsidy	(XX)
e) Initial cash outflow	XXXX

Step-2: Estimation of operating cash inflow (CFAT):

a) Cash sales / Revenue	XXXX
b) Less: Variable cost	(XX)
c) Contribution	XXXX
d) Less: cash fixed cost	(XX)
e) Profit before depreciation, Interest & Tax (EBDIT)	XXXX
f) Less: Depreciation	(XX)
g) Profit before interest & tax	XXXX
h) Less: Interest (in case of discounting "C.F" ignore interest)	(XX)
i) Profit before tax	XXXX
j) Less: tax	(XX)
k) Profit after tax (Accounting Pft)	XXXX
l) Add: Depreciation (non cash expenses)	XX
m) Cash flow after tax (cash Pft) - CFAT →	XXXX

Step-3: Estimation of Terminal cash flows:

a) Gross sale proceeds from sale of assets	XXX
b) Less: closing W.D.V of asset (W.D.V = cost - Accumulated Depreciation)	(XX)
c) Capital Gain / Capital loss	XXX
d) Less: Tax (If capital gain)	(XX)
Add: Tax benefit (If capital loss)	XX
e) Net sale proceeds from sale of Asset (a ± d)	XXX
f) Add: Recovery of working capital	XX
g) Terminal cash flow	XXX

Tax Shield / Tax savings / Tax benefit [This is an cash inflow]

→ It means reduction in income tax due, tax deductable expenses from taxable income

→ Tax shield on depreciation - Depreciation × tax rate

→ Tax shield on interest - Interest × tax rate

Discount rate

- % represented as company's cost of capital
  - → It is the cost incurred by company for financing of funds
  - → This is the minimum req^n rate of return for the capital provided by fund providers (Eg: S.H's, debt holders / lenders)
  - → It is also called as cut off / hurdle rates
- % represented as a opportunity cost of funds
  - This is rate of return foregone by committing the funds in a particular inv^st / project rather than investing in next best alternative use of funds

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Treatment of Interest cost while determining CFAT

- Long term funds
  - Discounting technique → Ignore
  - Non-Discounting technique → Reduce Interest
- Short term funds → Always reduce i.e., both in discounting and non-discounting techniques.

Decision rules: in case of both discounting & non-discounting techniques

(Those events do not occur at same time; when one event remains unaffected by the occurrence of other event)

Technique of the capital budgeting	selection of project [Single project]	Multiple projects: Mutually exclusive	Multiple projects: Mutually independent
1) Accounting rate of return (ARR)	ARR > COC	Highest ARR	All projects whose ARR > COC
2) Pay back period [PBP]	PBP < Target PBP	Shortest PBP	All projects whose PBP < Target PBP
3) Net present value [NPV]	+ve NPV	Highest NPV	All projects whose NPV is +ve
4) Internal rate of return [IRR]	IRR > COC	Highest IRR	All projects whose IRR > COC
5) Profitability index	PI > 1	Highest P.I	All the projects whose PI > 1
6) Discounted Pay back period [DPBP]	DPBP < Target PBP	Shortest DPBP	All the projects whose DPBP < target PBP

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9. Advanced Concepts in Capital budgeting and risk & return.

Replacement Decisions

Decision is related to replacement decision, then initial cash outflow shall be calculated as follows

Particulars	Amt (₹)	Amt (₹)
Cost of New Assets		XXXX
Add: Installation / set-up costs	XXXX	
Add/(Less): Increase/(decrease) in Net "W.C"	XXXX	
Less: Net proceeds from sale of old assets (if it is a replacement situation)	(XXX)	
Add/Less: Tax expense (savings/loss) due to sale of old asset	XXXX	XXXX
Initial Cash Outflow		XXX

Interim Cash Flows

Particulars	Amt (₹)
Net increase (decrease) in operating revenue	XXXX
Add/(Less): Net decrease (increase) in operating expenses	XXX
Net change in income before taxes	XXX
Add/(Less): Net decrease (increase) in taxes	XXX
Net change in income after taxes	XXX
Add/(Less): Net decrease (increase) in depreciation charges	XXX
Incremental net cash flow for the period	XXXX

Terminal-yr incremental Net cash flow:

Final salvage value (disposal costs) of assets	XXX
Add: Interim cash flow	XX
Add/Less: Tax savings (tax exp) due to sale/disposal of asset (Ind Dept)	XX
Add: Release of Net "W.C"	XX
Terminal Yr incremental net cash flow	XX

NPV & IRR Conflict

- **Size Disparity** → Difference in size of investment → Take decision based on N.P.V method (highest NPV)
- **Life Disparity** → Different projects have diff lives → Take decision based on N.P.V
- **Cash flow disparity** → Different pattern of future cash flows from different projects → Take decision based on N.P.V

Note: 1) There is no ranking conflict between NPV & IRR in case of mutually independent projects.
2) The ranking conflict b/w N.P.V & IRR in case of the mutually exclusive projects.

In case of conflict b/w N.P.V & IRR for life disparity in order to take a decision in such situation the following methods are:

Replacement Chain Method
→ Calculate NPV of both the projects after replacing the projects to their common life
→ When projects have different lifes they have to be brought to common life by applying L.C.M (Least common multiple)
→ Then take decision based on NPV after considering the C.F's in case of existing & replaced life of the project.

Equivalent Annualized Method
→ Calculate equivalent annualized NPV by applying PVAF

Process:
Step-1: Compute N.P.V of both projects
Step-2: Divide NPV by PVAF (r%, n yrs) for both projects
Step-3: Equivalent annualized NPV for both projects.
Decision: Select project whose equivalent annualized NPV is highest.

Equivalent Annualized Criteria

1) Equivalent Annualized benefit → Total benefits desired for project PVAF(r%, n yrs) → i.e., $\left(\frac{NPV}{PVAF(r\%, n yrs)}\right)$ → Project which has highest NPV has to
2) Equivalent Annualized cost → Total cost incurred during the project PVAF(r%, n yrs) → i.e., $\left(\frac{-NPV}{PVAF(r\%, n yrs)}\right)$ → Reject which has -ve NPV has to be selected

Decision making criteria

- **If projects are divisible** → Investment is possible in part of the project also → Investment in projects as per P.I rankings
- **If projects are indivisible** → Investment in part of project is not possible → Investment in projects with the different combinations select the combination which gives highest NPV

Capital Rationing: 1) It is the situation when the company has multiple alternatives of investment but has only limited funds.
2) In such case decision has to be given based on "P.I"

$$P.I = \frac{P.V \text{ of cash inflows}}{P.V \text{ of cash outflows}}$$

$$\text{Net } P.I = \frac{NPV}{\text{Present value of cash outflows}}$$

Adjusted NPV

→ When an entity converts from unlevered to levered (i.e; the inclusion of debt into its capital structure.

→ It will have some advantage in the form of tax shield on interest on debt

→ Adjusted NPV = Base case NPV + PV of tax shield on debt (−) flotation cost (towards debt only)

→ Base case NPV = NPV of unlevered company

→ Adjusted NPV says that if the project is financed from debt source of capital. It will have some addnl advantage from the project instead of a project which is 100% financed from equity

→ This addnl advantage will be due to tax shield on interest on debt.

Steps to calculate Adjusted "NPV"

Step-1 :- Calculate base case NPV (where project is from 100% equity)

Step-2 :- Present value of Tax shield on interest on debt

Step-3 :- Adjusted NPV = Step(1) - Step(2)

Block of Assets & Depreciation:

→ Block of assets refers to assets falling under the same class and same rate.

→ Depreciation is a non-cash item but it is considered in estimating CFAT in order to include the tax shield / benefit on depreciation.

→ This block of asset & depreciation concept arises when it is specifically mentioned in the problem the information relating to block of assets.

Depreciation treatment (on sale of asset)

When block of assets consists of only one asset

→ When such asset is sold we can't claim depreciation for that year

→ Capital gain / Capital loss is computed

When block of assets consists of more than one asset

→ When an asset is sold from a block of asset W.D.V for the purpose of depreciation is as follows

a) Opening WDV	XXX
b) Add:- addition to asset	XX
c) Less:- sale value of asset	(XX)
d) W.D.V for the purpose of depreciation	XXX

Risk :- 1) It can be measured with the help of statistical tools like probability, variance, standard deviation & co-efficient of variance.

2) All the above tools are used for finding the variation or deviation b/w estimated cash flows & actual cash flows

1) Variance (σ^2)

Step-1 :- Compute expected cashflows ($\bar{x}$) or mean

[sum of probability × estimated CFs]

Step-2 :- Compute $(x - \bar{x})$

Step-3 :- Compute $(x - \bar{x})^2$

Step-4 :- Sum of probability × $(x - \bar{x})^2$ → $\boxed{\Sigma P \times (x - \bar{x})^2}$

2) Standard deviation (σ) = $\sqrt{\text{variance}}$

3) Coefficient of variation: It measures the risk involved for every ₹1 of expected cash flow

$$CV = \frac{\text{Standard deviation}(\sigma)}{\text{Expected value / C.F}}$$

Note: If the data regarding cash flows is given in over a period of yrs instead of probabilities, then take average of given data

Expected rate of return

$$E(R) = R_1 \times P_1 + R_2 \times P_2 + R_3 \times P_3 + \cdots\cdots + R_n \times P_n$$

Where R = rate of returns & P = probability

Expected return on Portfolio:

$$E(R_P) = W_A E(R_A) + (1 - W_B) E(R_B)$$

Where;

$E(R_P)$ = Expected return of portfolio

W_A = Weight / Proportion of portfolio invested in security 'A'

$E(R_A)$ = Expected return on security A

$1 - W_B$ = Proportion of a portfolio invested in security 'B'

$E(R_B)$ = Expected return on security B.

When a portfolio consists of n number of securities, the expected return of portfolio would be

$$E(R_P) = \Sigma W_n E(R_n)$$

Where;

$E(R_P)$ = Expected return of portfolio

W_n = Weights of proportion of portfolio invested in security 'n'

$E(R_n)$ = Expected return on security 'n'

Total Return (%)

$$= \frac{\text{Dividend} + \text{Capital gain}}{\text{Initial investment}}$$

$$= \frac{P_1 + (P_1 - P_0)}{P_0}$$

$$= \frac{P_1}{P_0} + \frac{(P_1 - P_0)}{P_0}$$

Risk adjusted discount rate (RADR)

= CAPM

$$RADR = R_f + \beta(R_m - R_f)$$

Certainty Equivalent

$$CE.F(\alpha_t) = \frac{\text{Certain cash flow}}{\text{uncertain cash flow / estimated cash flow}}$$

Note: $0.5 \le \alpha_t \le 1$

Process:

Step-1: Calculate } Expected C.F / certain C.F } × C.E coefficient

Step-2:

Calculate -> NPV on basis of the certain C.F and risk free discount rate

Total return

$$= \frac{\text{cash payments received} + \text{Price change over the period}}{\text{Purchase price of the asset}}$$

Beta

↓ S.D (risk) of security / Portfolio

↓ S.D (risk) of the market

↓ Correlation blw the security & market

CAPM; $E(R_P) = R_F + \{\beta_P \times (R_M - R_F)\}$

Where;

$E(R_P)$ = Expected return on portfolio

R_F = risk free rate of Int / return

β_P = Portfolio beta / risk factor

R_M = Expected return on Market portfolio

$$\beta = \frac{COV(A.M)}{\sigma^2_M}$$

where; $COV_{(A,M)}$ = Covariance of returns of an individual COV's security (A) with returns for market (M)

σ^2_M = Variance of market returns

We k.T; $COV_{(A,M)} = \gamma_{(A,M)} \times \sigma_A \times \sigma_M$

where;

$\gamma_{(A,M)}$ = coefficient of correlation blw A & M

σ_A = S.D of returns of security 'A'

σ_M = S.D of market rate of returns

$$\beta = \frac{\gamma_{(A,M)} \times \sigma_A \times \sigma_M}{\sigma^2_M}$$

10. Funds Flow statement

Statement or schedule of changes in working capital

Particulars	Previous Yr (₹)	Current Yr (₹)	Effect on working capital: Increase	Decrease
Current Assets :-(A)				
Cash	XXX	XXX		
Bank	XXX	XXX		
Debtors	XXX	XXX		
Inventory	XXX	XXX		
Bills receivable	XXX	XXX		
Trade Investments	XXX	XXX		
Prepaid expenses	XXX	XXX		
other current assets	XXX	XXX		
Current Liabilities :-(B)				
Creditors	XXX	XXX		
Bills payable	XX	XX		
Ols expenses	XX	XX		
Short term loans	XX	XX		
Bank O.D	XX	XX		
* Proposed dividend	XX	XX		
* Provision for tax	XX	XX		
other current liabilities	XX	XX		
Total (B)	XXX	XXX		
Working Capital (A-B)	XXX	XXX		
Net Increase / decrease in "W.C"	XX	XX		

Funds from operation may be ascertained from 2 methods
a) Statement form
b) Account form

Acc/Pro for dep" & prio" for tax & dividend

a) Estimation of funds from operations in Statement form:

Statement of funds from operations for the _____

Particulars	Amt (₹)	Amt (₹)
Net Pft after tax for the Yr		XXX
Add :- Non-current / Non-operating expenses		
Depreciation	XX	
Loss on sale of Fixed assets	XX	
Interest on debentures	XX	
Goodwill written off	XX	
Provision for tax	XX	
Proposed dividend	XX	
Interim dividend	XX	
Transfer from statement of P&L A/c	XX	
other Non-current & Non-operating items debited	XX	XXX
Less :- Non-current & Non-operating incomes	*	
Int on investment	XX	
Dividend received	XX	
Pft on sale of F.A" (Revaluation)	XX	
Int on bank deposit	XX	
Refund of Tax	XX	
Other non-current & non-operating items credited	XX	XX
Net funds flow from Operation		XXX

Estimation of funds from operations in Account Form:

Dr — Adjusted P&L A/c for the period — Cr

Particulars	Amt (₹)	Particulars	Amt (₹)
To Non-current & Non-operating items charged:		By bal c/d	XXX
• T/F to G/L Reserve	XX	By non-current & non-operating items credited	
• Proposed dividend	XX	• Pft on sale of "F.A"	XX
• Goodwill written off	XX	• Income from investment	XX
• Preliminary Expenses	XX	• Other non-current & non-operating items	XX
• Depreciation	XX	By Net fund flow from operation	XX
• Provision for Taxation	XX		
• Other non-current & non-operating items	XX		
To bal c/d	XX		

Preparation of funds flow

Sources of Funds	Amt (₹)	Application of funds	Amt (₹)
• Issue of share capital	XX	• Redemption of "PS"	XX
• Issue of debentures of L.T loans	XX	• Redemption of debentures	XX
• Sale of F.A or L.T Invsts	XX	• Repayment of "L.T" loan	XX
• Non-trading income	XX	• Purchase of "F.A" / L.T.I	XX
• Decrease in working capital	XX	• Payment of dividends & tax	XX
• Any other increase in liability & decrease in asset	XX	• Any other non-trading payment	XX
		Increase in "W.C"	XX
		Any other decrease in liability & increase in asset	XX
Funds from operations	XX	Funds lost through the business operations	XX
	XXX		XXX

Dr — Provision for tax account A/c — Cr

Particulars	Amt (₹)	Particulars	Amt (₹)
To bank A/c (Tax paid) (-) O.A (b/f)	XXX	By bal b/d (P.Y bal) (OP bal)	XXXX
To bal c/d (Cl. bal) (C.Y bal)	XX	By P&L A/c (+) O.A (provision made during the year)	XXX
	XXX		XXX

Dr — Provision for depreciation A/c — Cr

Particulars	Amt (₹)	Particulars	Amt (₹)
To Asset A/c (Dep^n on asset sold)	XXX	By bal b/d	XXX
To bal c/d	XX	By Adj P&L A/c (b/f)	XX
	XXX		XXX

Dr — Provision for dividends A/c — Cr

Particulars	Amt (₹)	Particulars	Amt (₹)
To bank A/c (b/f) (Dividend paid)	XX	By bal b/d (P.Y's bal)	XXX
To bal c/d (C.Y's bal)	XXX	By P&L A/c (Dividend made)	XX
	XXX		XXX

Dr — Provision for doubtful debts A/c — Cr

Particulars	Amt (₹)	Particulars	Amt (₹)
To bad debts A/c	XX	By bal b/d (old provision)	XXX
To bal c/d (New provision)	XXX	By P&L A/c (b/f)	XX
	XXX		XXX

11. Cash flow Statement

Page No.
Date:

Cash Flow Statement (For the year ended)

Particulars	Amt (₹)	Amt (₹)
Cash Flows from Operating activities (Direct Method)		
• Cash sales & collection from debtors	XXX	
(-) Cash purchases & payment to creditors	(XX)	
Cash generating from operations	XXX	
(-) Income tax paid	(XX)	
Cash flows from operating activities before extra-ordinary items	XXX	
(+/-) Extra-ordinary items (loss due to fire, earth quake)	XX	XXX
Net cash flow operating activities		XXX
(or)		
Cash Flows from Operating activities (Indirect method)		
Net Pft before tax & extra-ordinary items		XXX
(+): Non cash & non-operating items which have already been debited to P&L A/c		
a) Depreciation	XX	
b) TIF to reserves & provisions	XX	
c) Goodwill written off	XX	
d) Preliminary expenses written off	XX	
e) Other intangible assets written off such as discount / loss on issue of shares / debentures, underwriting commission	XX	
f) loss on sale of disposal of "FA"	XX	
g) loss on sale of investments	XX	
h) Foreign exchange loss	XX	XX
(-): Non-cash & non-operating items which have already been credited to P&L A/c		
a) Gain on sale of "FA"	(XX)	
b) Pft on sale of investments	(XX)	
c) Income from interest / dividends on investments	(XX)	

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Date:

Particulars	Amt (₹)	Amt (₹)
d) Appreciation	(XX)	
e) Reserves written back	(XX)	
f) Foreign exchange gain	(XX)	(XX)
Operating Pft before working capital changes		XXX
Adjustment for changes in current operating assets & liabilities		
(-) Increase in current asset	(XX)	
+ decrease in current asset	XX	
+ increase in current liability	XX	
(-) decrease in current liability	(XX)	XX
Cash generated from operations		XXX
(-) taxes paid	(XX)	(XX)
Cash flow from operating activity before extra-ordinary items		XXX
(+/-): Extra-ordinary items (Such as refund of tax)	XX	XX
Net cash flow from operating activity		XXX
Cash from Investing Activities:		
• Sale of fixed assets	XX	
(-) purchase of investments	(XX)	
+ Interest / dividend received	XX	XX
Net cash flow from investing activities		XXX
Cash from financing Activities		
• Issue of shares, / debentures	XX	
(-) Repayments of "P.S", L.T borrowings	(XX)	
(-) interest / dividends Paid	(XX)	X
Net cash flow from financing activities		XX
Change in cash & cash equivalents		X
(+) opening bal of cash & cash equivalents		XX
Closing balance of cash & cash equivalents		XXX

Dr	Accumulated depreciation A/c			Cr
To Asset A/c (Previous Yr depreciation of Dep^n and asset sold)	xxx	By bal b/d (op bal)	xxxx
		By Depreciation A/c (P&L A/c) (current Yr depreciation) (+) in operating activity [Non-cash Exp]	xx
To bal c/d (cl. bal)	xx	
	xxx		xxx

Dr	Asset A/c			Cr
To bal b/d (op bal)	xxx	By Accumulated depreciation A/c	xxx
		By disposal of assets (at cost)	xxx
		By bank A/c [inflow - sale Proceeds]	xxx
To P&L A/c (Pft on sale of asset)		By P&L A/c (Loss on sale of asset)	xxx
To Bank A/c [outflow] (b/f) [Purchase]	xx	By bal c/d (cl. bal)	xxx
	xxx		xxx

Loss = Book value - Sale proceeds
(cost - depreciation)

Methods of Recording Depreciation

Method-1 :- When no provision for depreciation A/c is maintained

Depreciation A/c Dr
To Asset A/c

Method-2 :- When provision for Depreciation A/c is maintained

Depreciation A/c Dr
To Accumulated depreciation A/c

Dr	Disposal of asset A/c			Cr
To fixed assets (at cost)	xxx	To provision for depreciation A/c (Accumulated depreciation)	xx
To P/L A/c - Pft/Gain on disposal A/c (b/f)	xx	To bank A/c (sale value)	xx
		To P/L - Loss on disposal A/c (b/f)	xx
	xxx		xxx

S.NO	Transaction	Entry
1)	T/F from "F.A" at cost to disposal A/c	Disposal of "F.A" A/c Dr To Fixed assets A/c
2)	Cal the total dep^n from the date of purchase till date of disposal	Provision for Dep^n A/c Dr To disposal of "F.A" A/c
3)	Record of "S.P" in cr. side of the disposal of "F.A"	Cash/Bank A/c Dr To disposal of "F.A" A/c
4)	Close the disposal A/c If total debit > total credit	P&L A/c Dr To disposal of "F.A" (Loss on disposal)
5)	If total debit < total credit	Disposal of "F.A" A/c Dr (Gain on disposal) To P&L A/c

Note :- 1) S.P > B.V - Gain on disposal

2) S.P < B.V - Loss on disposal

Treatment for Dividend (Proposed)

P.Y balance	C.Y balance	Related adjustment	Accounting treatment
Given	Given	No	CY bal → Add in operating activities PY bal → deduct from the financing activities
Given	No	No	PY bal → Deduct from the financing activities
No	Given	No	C.Y bal → Add to operating activities
No	No	Dividend paid given	Dividend Paid → deduct from financing activities
Given	Given	Given	Through account

Dr — Discount on issue of shares / debentures A/c — Cr

To bal b/d	XXX	By Profit & Loss A/c (written off)	XX
To share capital / debentures	XX	By bal c/d	XXX
	XXX		XXX

Accounting treatment:

a) Amt of discount written off: Add back to current Yr's pfts for / ascertaining cash from operating activities

b) Amt of discount allowed during the Yr: show the net proceeds of shares / debentures as cash flow from financing activities

Difference b/w the closing bal & opening bal of P&L A/c

Add: The proposed dividend for the current year	XXX
Add: The Interim dividend paid during the year	XX
Add: Transfer to reserve	XX
Add: The provision for tax made during the year	XX
Less: Refund of tax credited to the P&L A/c	(XX)
Less: Extra-ordinary items, if any, credited to P&L A/c	(XX)
Net profit before tax & extra-ordinary items	XXX

Dividend

Interim dividend
- Paid in the middle of the financial Yr

Final dividend
- Paid after the end of the financial Yr

Treatment of Interim dividend

- Add: Net Pft before Tax and Extraordinary items
- Deduct: Cash flow from financing activities

Treatment of proposed Dividend

Previous Yr
- Add: "N.P" before Tax & Extra-ordinary items
- Deduct: Cash flow from financing activities

Current Yr
- No treatment
- Contingent liability

Net dividend Paid = Proposed dividend
(-) dividend Payable / Unpaid / unclaimed dividend