FINANCIAL MANAGEMENT

LEARN CONCEPTS WITH MCQ/EXAMPLES

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DEDICATED TO MY LOVABLE FATHER [RAMESH JAIN]

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Different Types of Questions:

Chapter	Types of Questions /adjustments

3	• Computation of Ratios [Liquidity Ratios, Capital structure ratios, Profitability ratios, Coverage ratios, Turnover Ratios]
	• Common Adjustments
	  o Using working capital and Current Ratio to compute Current Assets and Current Liabilities
	  o Using stock, Quick Ratio and current ratio to compute Current assets and current liabilities
	  o Using GP Margin, Gross profit and stock turnover ratio to compute Average stock/Closing stock
	  o Using combination of proprietary ratio and net working capital to compute fixed assets and capital employed
	• Dupont Model
	• Preparing Financial Statements using Ratios
	• Interpretation and comments based on ratios

4	• Cost of Irredeemable Debt
	• Cost of Redeemable Debt using formula method and short-cut method
	• Cost of Deep Discount Bond
	• Cost of Convertible Debt
	• Cost of Irredeemable Preference
	• Cost of Redeemable Preference using formula method and short-cut method
	• Cost of equity using Dividend growth model [Growth Rate computation using formula method and Point to Point Model]
	• Cost of equity using Earning growth model
	• Cost of equity using realized yield approach
	• Cost of equity through CAPM Approach
	• Cost of retained earnings
	• WACC based on Book value and Market Value
	• WMCC schedule
	• Optimum Capital Structure with maximum capex and retained earnings
	• Special Adjustments:
	  o Ex-interest vs cum-interest values
	  o Market value of equity and retained earnings
	  o Issue price vs current market price in cost of equity computation
	  o Issue price of debenture when market yield is given
	  o Impact of raising of additional capital on existing capital cost

5	• Optimum capital structure based on EPS/MPS/Market Value of firm • Financial Break-even point • Indifference Point • Computation of new EBIT based on ROI and new capital employed • Net Income Approach • Net Operating Income Approach • MM Approach without taxes • MM Approach with taxes • Primary Arbitrage and Reverse Arbitrage
6	• Format for computation of Leverages • Operating Leverage through base formula • Operating leverage through change in sales and change in EBIT • Operating leverage through MOS • Financial leverage through base formula • Financial leverage through change in EBIT and change in EPS • Combined leverage • Reverse working problems
7A	• Computation of Future Value • Computation of Present Value

Chapter	Types of Questions /adjustments
	• Future value of Annuity • Present value of Annuity • Valuation of Normal Perpetuity and Growing Perpetuity • Compounding Frequency and Effective Rate of Interest
7B	• Techniques of Capital Budgeting (Payback, Discounted Payback, ARR, IRR, NPV and Profitability Index) • Investment Decision (Revenue enhancement and cost Reduction) • Computation of Cash flows • **Special adjustments:** o Sunk cost, Opportunity Cost, Overheads, Reward to providers of capital, Changes in working capital, Incremental cash flows, tax saving on losses, Government Grants), Block of Assets Method • Net salvage value computation • NPV and IRR conflict • EAB and EAC • Abandonment decision • Replacement Decision • Capital Rationing • Modified IRR
8	• Walter's Model • Gordon's Model • Step-up Growth Model • Graham and Dodd Model • Lintner's Model • MM approach
9	• Liquidity vs Profitability • Working capital estimation through operating cycle method • Working capital estimation through individual estimation method for new company and existing company – Total Approach and Cash Cost Approach • **Special adjustments:** o Estimation of Work in Progress (based on DOC), Debtors (based on credit sales), Safety Margin • Computation of Maximum Permissible Bank Finance • Optimum Cash balance • Cash Budget • Evaluation of credit policy • Evaluation of collection policy • Cost of cash discount • Funding against eligible advances • Effective cost of factoring • Cost benefit analysis of factoring arrangement due to reduction in collection period

1. Introduction

- Ratio is a relationship expressed in mathematical terms between two connected items
- Two items can be from P&L (Net Profit ratio) or Balance sheet (Current ratio) or one item from P&L and one item form balance sheet (Debtors Turnover ratio)
- If one item is from P&L and the other item is from balance sheet then we should take average of the balance sheet item for ratio computation. For example, credit sales and average debtors will be used for Debtor Turnover Ratio

2. Liquidity Ratio/Short-Term Solvency Ratio

$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$	
$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$	• Quick Assets = Current Assets – Inventory – Prepaid expenses • Otherwise known as Acid-Test Ratio/ Liquid Ratio
$\text{Absolute Liquidity Ratio} = \frac{\text{Cash and Cash equivalents}}{\text{Current Liabilities}}$	
$\text{Basic defense interval} = \frac{\text{Cash and CE} + \text{Receivables}}{\text{daily operating expenses}}$	
Net Working Capital = Current Assets – Current Liabilities (excluding short-term loans)	

Example:

Cash and Cash equivalents = Rs.1,000 lacs; Receivables = Rs.500 lacs; Inventory = Rs.300 lacs; Daily expenses = Rs.10 lacs. How much is basic defense interval?

a. 100 days
b. 150 days
c. 180 days
d. 200 days

Answer:

$$\text{Basic defense internval} = \frac{\text{Cash and CE} + \text{Net receivables}}{\text{daily operating expenses}} = \frac{1{,}000 + 500}{10} = 150 \text{ days}$$

Example:

Current Assets = 20,00,000; Quick assets = 4/5 of Current Assets; Cash and cash equivalents = Half of quick assets; Current Liabilities = 2,00,000. How much is absolute liquidity ratio?

a. 10 Times
b. 8 Times
c. 4 Times
d. 3 Times

Answer:

$$\text{Absolute liquidity ratio} = \frac{\text{Cash and Cash Equivalents}}{\text{Current Liabilities}} = \frac{8{,}00{,}000}{2{,}00{,}000} = 4 \text{ Times}$$

- Quick Assets = 4/5 of 20,00,000 = 16,00,000
- Cash and Cash equivalents = 16,00,000/2 = Rs.8,00,000

Example:

Current ratio of a company is currently 3:1. What will be the impact on current ratio on collection of money from sundry debtors?

a. No impact
b. Current ratio will improve
c. Current ratio will deteriorate

Answer:

No impact on current ratio

3. Capital Structure Ratio/Long-Term Solvency

$\text{Debt Ratio} = \frac{\text{Total Debt}}{\text{Capital Employed}}$	• Capital Employed = Debt + Equity + Preference • Capital Employed = FA + CA – CL • Capital Employed = Total Assets - CL
$\text{Equity Ratio} = \frac{\text{Equity}}{\text{Capital Employed}}$	• Equity = Share Capital + Reserves – Fictitious Assets • **Note:** Preference can be part of Total debt or equity in the above two formulae
$\text{Debt to Equity Ratio} = \frac{\text{Total Debt}}{\text{Equity}}$	• Total debt can be replaced with total outside liabilities (or) short-term debt
$\text{Debt to total Assets Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$	• Total debt can be replaced with Total outside liabilities
$\text{Capital Gearing Ratio} = \frac{\text{Debt + Preference}}{\text{Equity}}$	
$\text{Proprietary Ratio} = \frac{\text{Owner Funds}}{\text{Total Assets}}$	

Example:

Networth = Rs.15,00,000; R&S to share capital = 0.50. How much is share capital?

a. 10,00,000
b. 5,00,000
c. 7,50,000
d. 15,00,000

Answer:

$\frac{\text{RS}}{\text{SC}} = 0.50; \text{RS} = 0.50\ \text{SC}$

- Share capital + Reserves = 15,00,000
- SC + 0.5SC = 15,00,000
- **Share capital = Rs.10,00,000**

Example:

Share capital = Rs.10,00,000; Reserves and surplus to shareholder funds = 0.40; How much is the shareholders fund?

a. Rs.4,00,000
b. Rs.25,00,000
c. Rs.16,66,667
d. Rs.20,00,000

Answer:

$\frac{\text{R\&S}}{\text{SF}} = 0.40; \text{Reserves and Surplus} = 0.40\ \text{SF}$

- Reserves is 40% of shareholder funds and hence share capital is 60 percent of shareholder funds
- Shareholder funds = (10,00,000/60%) = **Rs.16,66,667**

Example:

Capital Employed = Rs.50,00,000; Preference shares and debentures to capital employed = 30%; Reserves & Profit and Loss to issued capital equity = 25%. How much is the equity share capital?

a. Rs.26,25,000
b. Rs.28,00,000
c. Rs.35,00,000
d. Rs.15,00,000

Answer:

- Preference shares and debentures = 50,00,000 x 30% = Rs.15,00,000
- Networth = 50,00,000 – 15,00,000 = Rs.35,00,000
- Reserves surplus = 25% of share capital
- Networth = Share capital + Reserves
- 35,00,000 = SC + 0.25SC
- Share capital = 35,00,000/1.25 = **Rs.28,00,000**

Example:

Capital = Rs.100 lacs; P&L = Rs.20 lacs; Intangible assets = Rs.10 lacs; Debt = Rs.50 lacs. How much is the debt-equity ratio?

a. 0.50 Times

b. 2.50 Times
c. 0.45 Times

Answer:

- Debt = Rs.50 lacs
- Equity = 100 lacs + 20 lacs – 10 lacs = Rs.110 lacs. Intangible assets have been assumed to be fictitious in nature

$$\text{Debt Equity Ratio} = \frac{\text{Debt}}{\text{Equity}} = \frac{50}{110} = \mathbf{0.45\ Times}$$

Example:

Debt = Rs.10,00,000; Equity = Rs.20,00,000. How much is debt ratio?

a. 2 Times
b. 0.5 Times
c. 3 Times
d. 0.33 Times

Answer:

$$\text{Debt ratio} = \frac{\text{Debt}}{\text{Capital Employed}} = \frac{10,00,000}{10,00,000 + 20,00,000} = 0.33\ \text{Times}$$

Example:

Total Debt = 40,00,000; Total Assets = 60,00,000. How much is the proprietary ratio?

a. 0.67 Times
b. 0.33 Times
c. 1.50 Times
d. 3.00 Times

Answer:

$$\text{Proprietary Ratio} = \frac{\text{Proprietor Funds}}{\text{Total Assets}} = \frac{60,00,000 - 40,00,000}{60,00,000} = 0.33\ \text{Times}$$

4. Profitability Ratios Related to Sales

Income Statement:

Particulars	Amount	Ratio
Sales	XXX	
Less: COGS	(XXX)	$\text{COGS Ratio} = \frac{\text{COGS}}{\text{Sales}}$
Gross Profit	**XXX**	$\text{GP Ratio} = \frac{\text{GP}}{\text{Sales}}$
Less: Operating expenses	(XXX)	$\text{Operating expenses Ratio} = \frac{\text{Operating Expenses}}{\text{Sales}}$
Operating Profit	**XXX**	$\text{Operating Profit Ratio} = \frac{\text{Operating Profit}}{\text{Sales}}$
Less: Non-operating expenses	(XXX)	
Add: Non-operating incomes	XXX	
Profit Before Tax	**XXX**	$\text{Pre} - \text{tax Profit ratio} = \frac{\text{PBT}}{\text{Sales}}$
Less: Tax	(XXX)	
Profit after Tax	**XXX**	$\text{Net Profit ratio} = \frac{\text{Net Profit}}{\text{Sales}}$

Note:

$$\text{Financial Expenses ratio} = \frac{\text{Financial Expenses}}{\text{Sales}}$$

$$\text{Operating ratio} = \frac{\text{COGS} + \text{Operating Expenses}}{\text{Sales}}$$

Example:

Calculate operating expenses from the information given below

Sales	Rs.75,00,000
Rate of Income Tax	50%
Net profit to Sales	5%
Cost of Goods sold	Rs.32,90,000
Interest on debentures	Rs.60,000

a) Rs. 41,00,000

b) Rs. 8,10,000
c) Rs. 34,00,000
d) Rs. 33,90,000

Answer:

Sales	75,00,000
Less: COGS	-32,90,000
Gross Profit	**42,10,000**
Less: Operating expenses (b/f)	34,00,000
Operating Profit	**8,10,000**
Less: Interest on debentures	-60,000
EBT	**7,50,000**
Less: Tax @ 50%	-3,75,000
EAT (5% of sales)	**3,75,000**

Hence operating expenses will be Rs.34,00,000

Example:

Net profit to Capital = 1/5; Fixed Assets to Capital = 5/4; Fixed Assets = 40,00,000; NP Margin = 20 percent. How much is the sales?

a. 40,00,000
b. 80,00,000
c. 64,00,000
d. 32,00,000

Answer:

$\frac{\text{FA}}{\text{Capital}} = \frac{5}{4}; \frac{40,00,000}{Capital} = \frac{5}{4}; \text{Capital} = 32,00,000$

- Net Profit = 1/5 of 32,00,000 = 6,40,000
- NP margin = 20 percent of sales
- 6,40,000 = 20 percent of sales
- **Sales = Rs.32,00,000**

Example:

Following is the information relating to a company:

Particulars	**31.03.2022**	**31.03.2023**
Share capital	40,00,000	40,00,000
Reserves	20,00,000	25,00,000

Net Profit Margin = 10%

How much is the sales of the company?

a. Rs.2,50,00,000
b. Rs.2,00,00,000
c. Rs.50,00,000
d. Rs.1,00,00,000

Answer:

- Net profit of 2022-23 = Increase in reserves = Rs.5,00,000
- Net Profit = 10 percent of sales
- 5,00,000 = 10 percent of sales
- **Sales = (5,00,000/10%) = Rs.50,00,000**

Example:

GP = 30 percent of sales; Operating expenses = 12 percent of sales; How much is operating ratio?

a. 82 percent
b. 58 percent
c. 42 percent
d. 70 percent

Answer:

Operating ratio = COGS + Operating expenses
Operating ratio = 70 percent + 12 percent = 82 percent

Example:

Opening share capital = Rs.1,00,000; Opening reserves = Rs.20,000; There is no new issue of share shares and closing reserves is 20 percent of Networth. Net profit margin is 10%. How much is the sales?

a. Rs.2,50,000
b. Rs.2,00,000

c. Rs.50,000
d. Rs.1,00,000

Answer:

- Closing reserves is 20 percent of Networth and hence closing share capital is 80 percent of Networth
- Closing share capital = 80 percent of Networth
- 1,00,000 = 80 percent of Networth
- Networth = (1,00,000/80%) = Rs.1,25,000
- Closing reserves = 1,25,000 – 1,00,000 = Rs.25,000
- Net profit of the year = Closing reserves – Opening reserves = 25,000 – 20,000 = Rs.5,000
- Net Profit = 10 percent of sales
- 5,000 = 10 percent of sales
- **Sales = (5,000/10%) = Rs.50,000**

5. Coverage Ratio

- Coverage Ratio indicates the ability of the company to service fixed obligations such as interest, preference dividend, instalments etc

$$\text{Coverage Ratio} = \frac{\text{Source of Payment}}{\text{What are we paying}}$$

$\text{Interest coverage Ratio} = \frac{\text{EBIT}}{\text{Interest}}$	
$\text{PD coverage Ratio} = \frac{\text{PAT}}{\text{Preference Dividend}}$	
$\text{Equity Dividend Coverage Ratio} = \frac{\text{EAES}}{\text{Equity Dividend}}$	
$\text{DSCR} = \frac{\text{Earnings available for debt service}}{\text{Interest + Instalment}}$	• Earnings = PAT + Non-cash items (depreciation) + Interest
$\text{Fixed charge CR} = \frac{\text{EBIT + Depreciation}}{\text{Interest + Instalment}}$	•

Example:

PAT = Rs.10,00,000; 10% Preference capital = 2,00,000; Company paid equity dividend of 25% on equity capital of Rs10,00,000. How much is the equity dividend coverage ratio?

a. 4 Times
b. 5 Times
c. 3 Times
d. 3.92 Times

Answer:

$$\text{ED Coverage} = \frac{\text{PAT} - \text{Pref Dividend}}{\text{Equity Dividend}} = \frac{10,00,000 - 20,000}{2,50,000} = \mathbf{3.92\ TImes}$$

Example:

PAT = 8,00,000; Depreciation = 2,00,000; Interest paid = 3,00,000; Principal repaid = 2,00,000. How much is Debt Service Coverage Ratio?

a. 2 Times
b. 2.6 Times
c. 2.4 Times
d. 3 Times

Answer:

$$\text{DSCR} = \frac{\text{PAT + Depreciation + Interest}}{\text{Interest + Principal}} = \frac{8,00,000 + 2,00,000 + 3,00,000}{3,00,000 + 2,00,000} = 2.60\ \text{Times}$$

6. Profitability Ratios related to Return on Assets/Investments

$\text{ROI (or)ROCE} = \frac{\text{EBIT}}{\text{Capital employed}}$	• Pre-tax ROI
$\text{ROI (or)ROCE} = \frac{\text{EBIT x } (1 - \text{Tax})}{\text{Capital employed}}$	• Post-tax ROI
$\text{ROE} = \frac{\text{EAES}}{\text{Equity shareholders funds}}$	• Equity shareholder funds = Share capital + Reserves – Fictitious assets

$\text{ROA} = \frac{\text{Net Profit}}{\text{Total Assets}}$	• ROA can be pre-tax ROA (or) post-tax ROA

Example:

Gross Profit = 25,000 (10%); Total Assets = 50,000. Net Profit Margin = 2%. How much is Return on Assets?

a. 5%
b. 20%
c. 10%
d. 2%

Answer:

- GP is 10% of sales. Gross Profit is Rs.25,000 and hence sales is Rs.2,50,000
- NP Margin is 2% and hence Net profit is Rs.5,000 (2,50,000 x 2%)

$$\text{ROA} = \frac{\text{Net Profit}}{\text{Total Assets}} \text{x } 100 = \frac{5{,}000}{50{,}000} \text{x } 100 = \mathbf{10}\%$$

Example:

EBT = 10,00,000; The company has 12% debt of Rs.50,00,000. It also has equity capital of Rs.25,00,000 and reserves of Rs.15,00,000. How much is the return on capital employed?

a. 13.33%
b. 17.78%
c. 21.33%
d. 25.00%

Answer:

$$\text{ROCE} = \frac{\text{EBIT}}{\text{Capital Employed}} = \frac{10{,}00{,}000 + 6{,}00{,}000}{50{,}00{,}000 + 25{,}00{,}000 + 15{,}00{,}000} = 17.78\%$$

7. Profitability ratios from owners point of view

$\text{EPS} = \frac{\text{EAES}}{\text{No of equity shares}}$	
$\text{DPS} = \frac{\text{Equity Dividend}}{\text{No of equity shares}}$	
$\text{Payout ratio} = \frac{\text{DPS}}{\text{EPS}} \text{x } 100$	

8. Profitability ratios related to market

$\text{PE Multiple} = \frac{\text{MPS}}{\text{EPS}}$	
$\text{Dividend Yield} = \frac{\text{DPS}}{\text{MPS}} \text{x } 100$	• Dividend rate is basically dividend on face value whereas Dividend yield is dividend on market price
$\text{Earnings Yield} = \frac{\text{EPS}}{\text{MPS}} \text{x } 100$	
$\text{Market value to book value} = \frac{\text{MPS}}{\text{Book value per share}}$	$\text{Book value per share} = \frac{\text{SC} + \text{Reserves} - \text{FA}}{\text{No of equity shares}}$
$\text{Q Ratio} = \frac{\text{MV of equity and liabilities}}{\text{Replacement cost of assets}}$	

Example:

From the following information, calculate P/E ratio:

Equity share capital of Rs.10 each	Rs.8,00,000
9% preference share capital of Rs.10 each	Rs.3,00,000
Profit (after 35% tax)	Rs.2,67,000
Depreciation	Rs.67,000
Market price of equity share	Rs.48

a) 15 times
b) 16 times
c) 17 times
d) 18 times

Answer:

16 Times

Particulars	Amount
PAT	2,67,000
Less: Preference Dividend (3,00,000 x 9%)	-27,000
EAES	**2,40,000**
No of equity shares	80,000
EPS	3.00
MPS	48.00
PE Multiple (48.00/3.00)	16.00

Example:

PAT = Rs.3,50,000; 10% preference share capital = Rs.10,00,000; No of equity shares = 25,000 shares; Market price of equity share = Rs.50; How much is the earning yield?

a. 10%
b. 20%
c. 40%
d. 50%

Answer:

$$\text{EPS} = \frac{\text{PAT} - \text{Preference Dividend}}{\text{No of equity shares}} = \frac{3,50,000 - 1,00,000}{25,000} = \text{Rs. } 10 \text{ per share}$$

$$\text{Earnings Yield} = \frac{\text{EPS}}{\text{MPS}} \text{x } 100 = \frac{10}{50} \text{x } 100 = \mathbf{20}\%$$

9. Turnover Ratios (Used to assess effectiveness of usage of resources)

$$\text{Turnover Ratio} = \frac{\text{Sales}}{\text{Relevant item}}$$

- Relevant item can be total assets, fixed assets, current assets, working capital, capital employed
- For Debtors turnover ratio = Credit sales will be numerator
- For Creditors turnover ratio = Credit Purchases will be numerator
- For Inventory Turnover Ratio = COGS will be numerator
- Turnover ratio can be converted into days using the below formula:

$$\text{Average collection period} = \frac{365}{\text{Debtors Turnover Ratio}}$$

Example:

A company has average accounts receivable of Rs. 10,00,000 and annual credit sales of Rs. 60,00,000. Its average collection period would be

a) 60.83 days
b) 6.00 days
c) 1.67 days
d) 0.67 days

Answer:

$$\text{Average collection period} = \frac{10,00,000}{60,00,000} \text{x } 365 = 60.83 \text{ days}$$

Example:

Total Sales = 100 lacs; GP Margin = 40%; Average Stock = 20 lacs. How much is stock turnover ratio?

a. 5 Times
b. 2 Times
c. 3 Times

Answer:

$$\text{Stock Turnover Ratio} = \frac{\text{COGS}}{\text{Average Stock}} = \frac{100 \text{ lacs x } 60\%}{20 \text{ lacs}} = \mathbf{3 \text{ Times}}$$

Example:

Equity capital = 50 lacs; Reserves = 40 lacs; Fictitious assets = 20 lacs; Debt = 10 lacs; Turnover = Rs.200 lacs. How much is the capital turnover ratio?

a. 2 Times
b. 2.5 Times
c. 1 Time
d. 4 Times

Answer:

- Capital Employed = SC + Reserves – FA + Debt

- Capital employed = 50 lacs + 40 lacs – 20 lacs + 10 lacs = 80 lacs

$$\text{Capital Turnover Ratio} = \frac{\text{Sales}}{\text{Capital Employed}} = \frac{200 \text{ lacs}}{80 \text{ lacs}} = \mathbf{2.5 \text{ Times}}$$

Example:

Gross Profit = Rs.54,000; GP Margin = 20%. Credit sales is 4 times of cash sales. Debt collection period = 1 month. How much is debtors?

a. Rs.22,500
b. Rs.18,000
c. Rs.25,000
d. Rs.30,000

Answer:

$$\text{GP} = 20\% \text{ of sales} = \text{Rs. } 54{,}000; \text{Sales} = \frac{54{,}000}{20\%} = \text{Rs. } 2{,}70{,}000$$

- Credit sales is 4 times of cash sales. Hence sales of Rs.2,70,000 is split in the ratio of 4:1 to get credit sales (Rs.2,16,000) and Cash sales (Rs.54,000)
- Debtors = 2,16,000 x (1/12) = **Rs.18,000**

Example:

Gross Profit = 1,00,000 (25%). Closing stock is 10,000 higher than opening stock. How much is closing inventory if stock turnover ratio is 4 Times?

a. 75,000
b. 85,000
c. 80,000
d. 70,000

Answer:

- Gross Profit = 25% of sales = 1,00,000
- Sales = 1,00,000/25% = Rs.4,00,000
- COGS = 4,00,000 – 1,00,000 = 3,00,000

$$\text{Stock Turnover} = \frac{\text{COGS}}{\text{Average Stock}}$$

$$4 \text{ Times} = \frac{3{,}00{,}000}{\text{Average Stock}}; \mathbf{Average\ stock = 75{,}000}$$

- Closing stock – Opening stock = 10,000

$$\frac{\text{Closing stock} + \text{Opening stock}}{2} = 75{,}000$$

$$\text{Closing stock} + \text{opening stock} = 1{,}50{,}000$$

- Adding both equations we get 2 (Closing stock) = 1,60,000
- **Closing stock = (1,60,000/2) = Rs.80,000**

Example:

Opening Creditors = 10 lacs; Closing Creditors = 30 lacs; Cash Paid to Creditors = 100 lacs. How much is creditors turnover ratio?

a. 5 Times
b. 10 Times
c. 3.33 Times
d. 6 Times

Answer:

- Credit Purchases = 30 + 100 – 10 = 120 lacs

$$\text{Creditors Turnover Ratio} = \frac{\text{Credit Purchases}}{\text{Average Creditors}} = \frac{120 \text{ lacs}}{20 \text{ lacs}} = \mathbf{6 \text{ Times}}$$

Example:

If Gross Profit=54,000, GP Ratio=20%, Average collection period is 18 days (360 Days year), then find out Average Debtors considering that credit sales are 20% of total sales?

a. Rs.13,500
b. Rs.10,800
c. Rs.12,000
d. Rs.14,000

Answer:

- GP = 20% of sales = Rs.54,000
- Sales = 54,000/20% = Rs.2,70,000

- Credit sales = 80% of 2,70,000 = Rs.2,16,000

Average Debtors $= 2{,}16{,}000 \times \left(\frac{18}{360}\right) =$ **Rs. 10,800**

Example:

Fixed Assets Turnover Ratio =3 Times; Fixed Assets = Current Assets. How much is the total Assets Turnover Ratio?

a. 3 Times
b. 6 Times
c. 1.50 Times

Answer:

- Let us assume fixed assets = Rs.100
- Sales = 100 x 3 Times = Rs.300
- Total Assets = Fixed Assets + Current Assets = 100 + 100 = Rs.200

Total Assets Turnover Ratio $= \frac{\text{Sales}}{\text{Total Assets}} = \frac{300}{200} =$ **1.50 Times**

Example:

Given data:- Gross Profit= ₹60,000, GP Ratio=20%, Stock Velocity=6 times then find out what is average stock ?

a) 40,000
b) 3,00,000
c) 2,40,000
d) 37,500

Answer:

- GP = 20% of sales = Rs.60,000
- Sales = 60,000/20% = Rs.3,00,000
- COGS = 3,00,000 – 60,000 = Rs.2,40,000
- Average Stock = (COGS/Stock Velocity) = 2,40,000/6 = **Rs.40,000**

Example:

Cash Sales = 25 percent of Credit Sales; Total Sales = 10,00,000; Debtors Turnover Ratio = 5 Times. How much is the average receivables?

a. Rs.2,00,000
b. Rs.1,50,000
c. Rs.1,60,000
d. Rs.1,00,000

Answer:

Cash Sales + Credit sales = Total sales

0.25 Credit sales + Credit sales = Total Sales

1.25 credit sales = Rs.10,00,000

Credit sales = (10,00,000/1.25) = Rs.8,00,000

Debtors Turnover Ratio $= \frac{\text{Credit Sales}}{\text{Average Debtors}}$

$5 = \frac{8{,}00{,}000}{\text{Average Debtors}}$; **Average debtors = 1,60,000**

10. Common Adjustments/Reverse Working

- Using working capital and Current Ratio to compute Current Assets and Current Liabilities
- Using stock, Quick Ratio and current ratio to compute Current assets and current liabilities
- Using GP Margin, Gross profit and stock turnover ratio to compute Average stock/Closing stock
- Using combination of proprietary ratio and net working capital to compute fixed assets and capital employed

Example:

Current Ratio is 2.5:1 and Liquid Ratio is 1.5:1. If inventory is ₹ 9,60,000, then the amount of current assets will be:

a. Rs.9,60,000
b. Rs.14,40,000
c. Rs.24,00,000
d. Rs.38,40,000

Answer:

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

$$2.5 = \frac{\text{Current Assets}}{\text{Current Liabilities}}; \mathbf{CA = 2.5CL}$$

$$\text{Liquid ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

$$1.5 = \frac{\text{Quick Assets}}{\text{Current Liabilities}}; \mathbf{QA = 1.5CL}$$

- Inventory = Current Assets – Quick Assets
- 9,60,000 = 2.5CL – 1.5CL
- CL = 9,60,000
- **CA = 9,60,000 x 2.5 = Rs.24,00,000**

Example:

Net Fixed Assets = Rs.40,00,000; Depreciation rate = 20 percent. How much is the Gross Fixed Assets?

a. Rs.48,00,000
b. Rs.50,00,000
c. Rs.32,00,000
d. Rs.30,00,000

Answer:

- Depreciation rate = 20 percent and hence net block is 80 percent of gross block
- 40,00,000 = 80 percent of Gross Block
- Gross Block = (40,00,000/80%) = **Rs.50,00,000**

Example:

Fixed Assets = Rs.15,00,000; Current Assets = Rs.11,25,000; Current Ratio = 1.5:1; Capital gearing ratio = 0.5:1; How much is the Networth?

a. Rs.20,00,000
b. Rs.18,75,000
c. Rs.9,37,500
d. Rs.12,50,000

Answer:

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{1.5}{1}; \frac{11,25,000}{CL} = \frac{1.5}{1}; \text{CL} = 7,50,000$$

- Capital Employed = Fixed Assets + Current Assets – Current Liabilities
- Capital Employed = 15,00,000 + 11,25,000 – 7,50,000 = Rs.18,75,000

$$\text{Capital Gearing Ratio} = \frac{\text{Fixed Charge Bearing Capital}}{\text{Networth}} = \frac{0.5}{1}$$

- Hence capital employed will be split in the ratio of 0.5:1 to get fixed charge bearing capital and networth
- **Networth = 18,75,000 x (1/1.5) = Rs.12,50,000**

Example:

Total Current Assets = Rs.50 lacs; Cash = 30 percent of current assets; Debtors Turnover Ratio = 4 Times; Inventory Turnover Ratio = 8 Times; GP Margin = 20 percent. How much is the sales?

a. Rs.50,00,000
b. Rs.80,00,000
c. Rs.2,00,00,000
d. Rs.1,00,00,000

Answer:

- Cash = 30 percent of current assets = 30 percent x 50 lacs = Rs.15 lacs
- Stock + Inventory = 50 lacs – 15 lacs = Rs.35 lacs

Let us assume sales to be X and hence COGS will be 0.8X

$$\text{Stock} + \text{Debtors} = 35,00,000$$

$$\frac{0.8X}{8} + \left(\frac{X}{4}\right) = 35,00,000; 0.35X = 35,00,000; X = \frac{35,00,000}{0.35} = \text{Rs. } 100 \text{ lacs}$$

- **Hence sales = Rs.1,00,00,000**

Example:

Current Ratio = 1.5:1; Current Liabilities = Rs.20,00,000; Fixed Assets = 40 percent of total assets. How much is the total Assets?

a. Rs.30,00,000
b. Rs.50,00,000
c. Rs.40,00,000
d. Rs.75,00,000

Answer:

- Current Assets = 20,00,000 x 1.50 = Rs.30,00,000
- Fixed assets = 40 percent of total assets and hence current assets is 60 percent of total assets
- Current Assets = 60 percent of total assets = Rs.30,00,000
- **Total Assets = (30,00,000/60%) = Rs.50,00,000**

Example:

Sales = Rs.600 lacs; Net Profit margin (after tax) = 10%; Return on Networth = 20%. Share capital and reserves is in the ratio of 6:4. How much is the reserves?

a. Rs.300 lacs
b. Rs.180 lacs
c. Rs.120 lacs
d. Rs.600 lacs

Answer:

Net profit after tax $= 600 \text{ x } 10\% = \text{Rs. } 60 \text{ lacs}$

$$\text{RONW} = \frac{\text{Net Profit}}{\text{Networth}}; 20\% = \frac{60 \text{ lacs}}{\text{Networth}}; \text{Networth} = \frac{60 \text{ lacs}}{20\%} = \text{Rs. } 300 \text{ lacs}$$

- Networth of Rs.300 lacs will be split in the ratio of 6:4 for share capital and reserves
- **Reserves = Rs.300 lacs x (4/10) = Rs.120 lacs**

Example:

Fixed Assets to Networth = 1.3:1; Reserves and surplus to share capital = 1:1.5; Fixed Assets = Rs.39,00,000. How much is the share capital?

a. Rs.30,00,000
b. Rs.20,00,000
c. Rs.18,00,000
d. Rs.15,00,000

Answer:

$$\text{Networth} = \frac{\text{Fixed assets}}{1.3} = \frac{39,00,000}{1.30} = 30,00,000$$

$$\frac{\text{Reserves}}{\text{Share capital}} = \frac{1}{1.5}; \text{Share capital} = 1.5 \text{ Reserves}$$

Networth = Share capital + Reserves
30,00,000 = 1.5 Reserves + Reserves
Reserves = 12,00,000
Share capital = 18,00,000

Example:

Fixed Assets to Proprietor Fund = 40%; Net working capital = 30,00,000; There is no debt capital. How much is the Proprietor Funds?

a. 12,00,000
b. 75,00,000
c. 50,00,000
d. 18,00,000

Answer:

$$\frac{\text{Fixed Assets}}{\text{Proprietor Funds}} = 0.40; \text{FA} = 0.4 \text{ PF}$$

- PF = Fixed Assets + Net Working Capital
- PF = 0.4PF + 30,00,000
- **PF = 50,00,000**

Example:

Fixed Assets Turnover Ratio = 4 Times; Stock Turnover ratio (on basis of sales) = 6 Times; Stock is equal to debtors; Cash = 5,00,000; Debt-equity ratio = 1:1; Current Ratio = 3:1; Sales to Networth = 4 Times. How much is the sales?

a. 80 lacs

b. 100 lacs
c. 120 lacs
d. 150 lacs

Answer:

Note 1: Computation of Total Liabilities:

Let us assume sales to be X

$\text{Networth} = \frac{\text{Sales}}{4} = \frac{\text{X}}{4}$
$\text{Long} - \text{term debt} = \text{Networth} = \frac{\text{X}}{4}$
$\text{Current Liabilities} = \frac{\text{Current Assets}}{3}$
$\text{Total Liabilities} = \text{Total Assets} = \left(\frac{\text{X}}{4}\right) + \left(\frac{\text{X}}{4}\right) + \frac{\text{Current Assets}}{3}$

Note 2: Computation of Total Assets:

$\text{Fixed assets} = \frac{\text{Sales}}{4} = \frac{X}{4}$
$\text{Stock} = \frac{\text{Sales}}{6} = \frac{X}{6}$
$\text{Debtors} = \text{Stock} = \left(\frac{\text{X}}{6}\right)$
$\text{Cash} = 5{,}00{,}000$
$\text{Total Current Assets} = \left(\frac{\text{X}}{6}\right) + \left(\frac{\text{x}}{6}\right) + 5{,}00{,}000$
$\text{Total Assets} = \left(\frac{\text{X}}{4}\right) + \left(\frac{\text{x}}{6}\right) + \left(\frac{\text{x}}{6}\right) + 5{,}00{,}000$ $\left(\frac{\text{x}}{4}\right) + \left(\frac{\text{x}}{4}\right) + \left(\frac{\text{X}}{18}\right) + \left(\frac{\text{X}}{18}\right) + \frac{5{,}00{,}000}{3} = \left(\frac{\text{X}}{4}\right) + \left(\frac{\text{x}}{6}\right) + \left(\frac{\text{x}}{6}\right) + 5{,}00{,}000$
$\frac{9\text{X} + 9\text{X} + 2\text{X} + 2\text{X} + 60{,}00{,}000}{36} = \frac{3\text{X} + 2\text{X} + 2\text{X} + 60{,}00{,}000}{12}$
22X + 60,00,000 = 21X + 1,80,00,000 Sales = 1,20,00,000

Example:

If Working capital of company is ₹1,35,000, Current ratio=2.5, Liquid ratio=1.5, reserve & surplus is=₹90,000 then what are the Quick assets of the company?

a. Rs.90,000
b. Rs.1,35,000
c. Rs.1,45,000
d. Rs.60,000

Answer:

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

$$2.5 = \frac{\text{Current Assets}}{\text{Current Liabilities}}; \mathbf{CA = 2.5CL}$$

- Working capital = CA – CL
- 1,35,000 = 2.5CL – CL
- **CL = Rs.90,000**

$$\text{Liquid ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

$$1.5 = \frac{\text{Quick Assets}}{90{,}000}; \mathbf{QA = 1{,}35{,}000}$$

11. ROE as per Dupont Framework

$$\text{ROE} = \frac{\text{EAES (or) PAT}}{\text{Amount of equity}}$$

Dupont framework said that ROE contains the following components:

- Net Profit Margin

- Asset Turnover Ratio
- Equity Multiplier

Framework says that ROE can be improved with improvement in any of the sub-components.

$$ROE = \frac{\text{Net Profit}}{\text{Sales}} x \frac{\text{Sales}}{\text{Assets}} x \frac{\text{Assets}}{\text{Equity}}$$

ROE = Net Profit Margin x Asset Turnover Ratio x Equity Multiplier

Example:

NP Margin = 10%; Asset Turnover = 2 Times; (Equity/Assets) = 0.50. How much is ROE?

a. 20%
b. 10%
c. 40%
d. 60%

Answer:

$$ROE = \text{NP Margin x Asset Turnover x } \left(\frac{\text{Assets}}{\text{Equity}}\right) = 10\% \text{ x } 2 \text{ x } \frac{1}{0.50} = 40\%$$

Example:

Net income = Rs.10,00,000; NP Margin = 5%; Assets = 50,00,000; (Equity/Assets) = 0.40 Times. How much is the ROE?

a. 20%
b. 50%
c. 40%
d. 100%

Answer:

- Equity = 0.40 x 50,00,000 = Rs.20,00,000

$$ROE = \frac{\text{Net Income}}{\text{Equity}} \text{ x } 100 = \frac{10,00,000}{20,00,000} x\ 100 = 50\%$$

12. Net Income vs Operating Income

- Net income means PAT and operating income means EBIT

Chapter 4 – Cost of Capital

1. Introduction

- The term capital means long-term money
- Capital structure means composition of this long-term money
- Long-term money includes long-term debt, equity and preference
- Cost of capital is the reward expected/to be paid to the providers of capital

2. Cost of Debt

Type	Redeemable, Irredeemable, Convertible
Face value	Rs.100 (if problem is silent)
Coupon Rate	Interest rate payable on bond
Issue price	Can be issued at par, premium or discount. Issue will be at par if problem is silent
Redeemable value	Can be redeemed at par, premium or discount. Redemption will be at par if problem is silent
Interest	Face value x Coupon Rate
Interest after tax	Interest x (1 – Tax Rate)

$$\text{Cost of irredeemable debt } (K_d) = \frac{\text{Interest after tax}}{\text{Net proceeds}}$$

- Net proceeds = Amount collected by the company
- In case of new issue, Net proceeds = Issue price – Floatation cost
- In case of existing issue, Net proceeds = Current market price

$$\text{Cost of redeemable debt } (K_d) = \frac{\text{Interest after tax} + \text{Average other costs}}{\text{Average Funds Employed}}$$

Where

$$\text{Average other costs} = \frac{\text{Redeemable value} - \text{Net Proceeds}}{\text{Balance life}}$$

$$\text{Average Funds employed} = \frac{\text{Redeemable value} + \text{Net Proceeds}}{2}$$

Example:

A company issues 1,000,000 12% debentures of Rs.100 each. The debentures are redeemable after the expiry of fixed period of 7 years. The company is in 35% tax bracket. Calculate cost of debt after tax, if debentures are issued at 10% discount:

a. 7.80%
b. 9.72%
c. 6.07%
d. 8.17%

Answer:

$$\text{Cost of debt} = \frac{\left(7.8 + \frac{100 - 110}{7}\right)}{\frac{100 + 110}{2}} = \frac{7.8 - 1.43}{105} \text{x } 100 = 6.07\%$$

Example:

A company issued 10,000, 10% debentures of Rs. 100 each at par on 1.4.2018 to be matured on 1.4.2028. The company wants to know the cost of its existing debt on 1.4.2023 when the market price of the debentures is Rs. 80. COMPUTE the cost of existing debentures assuming 35% tax rate

a. 6.5%
b. 10.00%
c. 11.67%
d. 10.50%

Answer:

$$K_d = \frac{\text{Interest after tax} + \text{Average other costs}}{\text{Average funds employed}} = \frac{6.5 + 4}{90} \text{x } 100 = 11.67\%$$

Example:

A perpetual bond sold at 10% premium with an interest rate of 8%. What is the cost of debt if tax rate is 30%?

a. 8%

b. 5.6%
c. 5.09%
d. 7.27%

Answer:

5.09%

Let us assume face value to be Rs.100 and hence issue price is Rs.110. Interest paid on bond is Rs.8 and after-tax it will be Rs.5.60

$$\text{Cost of debt} = \frac{5.6}{110} \text{x } 100 = 5.09\%$$

Example:

A company issued debentures 5 years ago for a period of 10 years. The face value of the debenture is Rs.100 and its coupon rate is 10%. It incurred a floatation cost of 10% and its current market price is Rs.85. It will be redeemed at a premium of 5%. Tax rate is 25%.

a. 12.11%
b. 9.00%
c. 8.78%
d. 13.00%

Answer:

$$K_d = \frac{\text{Interest after tax} + \text{Average other costs}}{\text{Average funds employed}} = \frac{7.50 + 4}{95} \text{x } 100 = 12.11\%$$

$$\text{Average other costs} = \frac{\text{Redeemable value} - \text{Net proceeds}}{\text{Balance life}} = \frac{105 - 85}{5} = \text{Rs. } 4$$

$$\text{Average funds employed} = \frac{\text{Redeemable value} + \text{Net proceeds}}{2} = \frac{105 + 85}{2} = \text{Rs. } 95$$

Example:

10-year bond with a face value of Rs.50 is sold for Rs.40. Interest rate on bond is 10% and tax rate is 30%. How much is the cost of debt?

a. 7%
b. 10%
c. 9%
d. 8%

Answer:

$$\text{Cost of debt} = \frac{(50 \text{ x } 10\% \text{ x } 70\%) + \frac{50 - 40}{10}}{\frac{50 + 40}{2}} = \frac{4.5}{45} = 10.00\%$$

Example:

Ranu & Co. has issued 10% debenture of face value 100 for Rs.10 lakh. The debenture is expected to be sold at 5% discount. It will also involve floatation costs of Rs.10 per debenture. The debentures are redeemable at a premium of 10% after 10 years. Calculate the cost of debenture if the tax rate is 30%.

a. 9.74%
b. 9.56%
c. 8.25%
d. 10.12%

Answer:

$$\text{Cost of debt} = \frac{(10 \text{ x } 70\%) + \frac{110 - 85}{10}}{\frac{110 + 85}{2}} = \frac{9.50}{97.50} = 9.74\%$$

3. Cost of Redeemable Debt (using IRR/YTM Approach)

- **Step 1:** Write the after-tax cash flows of the bond
- **Step 2:** Discount the cash flows at a guess rate and compute NPV
- **Step 3:** If NPV is positive, reduce the discount rate and if NPV is negative, increase the discount rate. Repeat step 3 till we get one positive and one negative NPV
- **Compute IRR using the formula. The computed IRR is the cost of debt**
- Cost of debt for Deep discount bond can be computed only using YTM approach

4. Cost of Convertible Debt

- Cost of convertible debt is computed using the same formula as cost of redeemable debt. It can be computed using short-cut approach or IRR approach
- The only change is in the computation of Redeemable value
- Redeemable value will be higher of the following:
  - Redemption value of debt
  - Conversion value of equity = Conversion ratio x Expected market price per share

Example:

TT Ltd. issued 20,000, 10% convertible debenture of Rs.100 each with a maturity period of 5 years. At maturity the debenture holders will have the option to convert debentures into equity shares of the company in ratio of 1:5 (5 shares for each debenture). The current market price of the equity share is Rs.20 each and historically the growth rate of the share is 4% per annum. Assuming tax rate is 25%. How much is the maturity cash flow on redemption/conversion of the bond?

e. Rs.100.00
f. Rs.121.67
g. Rs.125.00
h. Rs.110.00

Answer:

Rs.121.67

Redeemable value will be higher of the following:

- **Conversion into equity:** One debenture will be converted into 5 equity shares. Current market price of one equity share is Rs.20. Equity shares will grow at 4 percent and expected price per share in year 5 is Rs.24.333 ($20x\ (1.05)^5$). Value of 5 shares received on redemption is equal to Rs.121.67
- **Redemption as debt:** Debenture can be redeemed and debenture holder receive Rs.100

Example:

15% convertible debentures of Rs. 100 each at par with a maturity period of 6 years. On maturity, each debenture will be converted into 2 equity shares of the company. The riskfree rate of return is 10%, market risk premium is 18% and beta of the company is 1.25. The company has paid dividend of Rs. 12.76 per share. Five year ago, it paid dividend of Rs. 10 per share Flotation cost is 5% of issue amount. How much is the value received on conversion? [FVIF (5 years, 5%) = 1.276; FVIF (5 years, 4%) = 1.217; FVIF (5 years, 6%) = 1.338]

a. Rs.130.54
b. Rs.100.00
c. Rs.90.00
d. Rs.120.00

Answer:

Value on conversion = 2 shares x 65.27 = Rs.130.54

$$\text{Price}_6 = \frac{D_7}{K_e - G} = \frac{17.95}{32.5\% - 5\%} = \frac{17.95}{27.50\%} = \text{Rs. } 65.27$$

Notes:

- Cost of equity = Rf + Beta x (Rm – Rf) = 10 + 1.25 x 18 = 32.50%

Computation of growth rate:

- Dividend of Rs.10 has become Rs.12.76 in five years
- Hence present value = Rs.10; Future value = Rs.12.76; Number of years = 5; rate of interest (growth rate) = ?

$$\text{Future value} = \text{Present value x } (1 + r)^n$$
$$12.76 = 10 \text{ x } (1 + r)^5$$
$$(1 + r)^5 = 1.276$$

- From the given table values in question we can infer that r = 5% and hence growth rate is equal to 5 percent
- Dividend at end of 7 years = $12.76 \text{ x } (1 + 5\%)^7$ = Rs.17.95

5. Value of Bond

- Fair value of bond is the present value of future cash flows (interest and principal) discounted at investor's required rate of return

Relationship	Issue price/CMP
Interest rate = Investor expectation	Par Value (meet expectation)
Interest rate > Investor expectation	Premium (exceed expectation)
Interest rate < Investor expectation	Discount (Does not meet expectation)

- Value of an irredeemable bond can be computed using the formula of perpetuity valuation

$$\text{Value of bond} = \frac{\text{Interest in Rs.}}{\text{Investor expectation or yield}}$$

Example:

A company is planning a new bond issue. The company would pay an interest rate of 12% whereas market expectation is around 10%. What would be the probable issue price?

a. Issue at par
b. Issue at premium
c. Issue at discount

Answer:

Issue at premium

- Bond will be issued at premium as the bond is paying interest higher than the required rate of the market

6. Cost of Equity

- Equity shares takes the character of a perpetuity as there is no end to life of an equity share
- An equity shareholder gets reward in the form of Dividend and capital appreciation (growth)

$$K_e = \left(\frac{D_1}{P_o - F}\right) + G$$

- D1 = Dividend of next year = Dividend of current year + Growth rate
- P0 = Issue price (or) Current market price
- F = Floatation cost per share
- G = Growth rate = Growth rate can be negative as well

Example:

A company's equity share is currently selling for 50 per share. Current year's dividend was Rs. 2 per share and the earnings of the company is expected to increase by 5%. What is the firm's cost of existing equity

a) 9.2%
b) 4.2%
c) 14%
d) 9%

Answer:

$$K_e = \frac{2 + 5\%}{50} + 5\% = 9.2\%$$

Example:

A company's cost of equity is 14%. The current share price is Rs.25. Growth rate will change from 6% to 8%. What is the likely share price due to change in growth rate?

a. Rs.25.00
b. Rs.16.67
c. Rs.33.33
d. Rs.40.00

Answer:

Rs.33.33

Existing data:

$$0.14 = \frac{D_1}{25} + 0.06; 0.08 = \frac{D_1}{25}; \text{Dividend per share} = \text{Rs. } 2$$

Revised scenario:

$$0.14 = \frac{2}{P_0 - 0} + 0.08; 0.06 = \frac{2}{P_0}$$

$$\mathbf{P_0 = \frac{2}{0.06} = Rs.33.33 \text{ per share}}$$

7. How to compute Growth Rate?

Formula based:

Growth Rate = ROE x Retention Ratio

- ROE can be replaced with IRR/ROI
- Retention ratio = 100% - Payout ratio (or) (Retained EPS/EPS) x 100

Point to point model:

- Identify the first dividend and call it as present value; Identify the last dividend and call it as future value
- FV = PV x (1+r)^n (or) FV = PV x Future value factor (r,n)
- Identify the rate which will work in the above formula and the same would be taken as growth rate

Example:

With retention ratio of 60% and return on equity of 15.5%, the growth rate shall be

a) 14.90%
b) 9.30%
c) 25.84%
d) 16.10%

Answer:

Growth Rate = Retention Ratio x ROE = 60% x 15.5% = 9.30%

Example:

A share of X ltd which has no external financing is selling for Rs.50 the EPS is Rs.7.50 of which 60% will be paid in dividends immediately. The company reinvests retained earnings at a rate of 10%. Calculate the cost of equity

a. 13.00%
b. 13.36%
c. 9.00%
d. 4.00%

Answer:

$K_e = \frac{D_1}{P_0 - F} + \text{Growth rate}$

$\mathbf{K_e = \frac{4.68}{50 - 0} + 0.04 = 0.0936 + 0.04 = 0.1336(or)13.36\%}$

Note:

- D1 = (7.50 x 60%) + 4% = Rs.4.68
- Growth = 40% x 10% = 4.00%

8. Cost of Equity through Realized Yield Approach

- This approach would be used if the cash flow from investor point of view is available
- Write cash flows of investor and compute IRR of the investor
- The computed IRR is the cost of equity as per realized yield approach

9. Cost of Equity through Capital Asset Pricing Model (CAPM) Approach

Cost of equity $= R_f + \text{Beta x } (R_m - R_f)$

- Rf = Risk-free rate = Interest rate of Government security in India's context
- Beta = Risk of a company/security
- Rm = Market return = Return of Nifty/Sensex in India's context
- Rm – Rf = Risk premium of market

Example:

The risk free rate of return is 8%. The beta of X Limited is 1.4. The risk premium of the market is 12%. Compute cost of equity using CAPM.

a. 13.60%
b. 16.80%
c. 24.80%
d. 8.80%

Answer:

Cost of equity = 8 + 1.40 x 12 = 24.80%

10. Cost of Equity through Earnings-based Approach

$K_e = \left(\frac{E_1}{P_o - F}\right) + G$

E1 = EPS of next year = EPS of current year + Growth rate

11. Cost of Retained Earnings

- Retained earnings (Internal equity) refers to the earnings which are not paid out as dividend. A company also has to pay a cost for retaining the earnings
- Cost of retained earnings is same as cost of equity except in following situations:
  - Existence of floatation costs
  - Information relating to personal tax rate given in question

Floatation costs:

- (P0 – F) will be replaced with P0 in computation of cost of retained earnings. Additionally, P0 will be taken as current market price for Kr computation

Personal taxes:

$K_r = K_e$ x (1 − Personal Tax rate)x (1 − Floatation cost %)

Example:

Y Ltd. retains Rs.7,50,000 out of its current earnings. The expected rate of return to the shareholders, if they had invested the funds elsewhere is 10%. The brokerage is 3% and the shareholders come in 30% tax bracket. Calculate the cost of retained earnings.

a. 6.79%
b. 10.00%
c. 7.00%
d. 4.00%

Answer:

$\mathbf{K_r = [K_e \text{ x } (1 - \text{Personal tax rate}\%)] - [1 - \text{Floatation cost}\%]}$

$K_r = [0.10 \text{ x } (1 - 0.30)] - [1 - 0.03] = 0.0679$ (or) 6.79%

12. Cost of Preference

Type	Redeemable, Irredeemable, Convertible
Face value	Rs.100 (if problem is silent)
Coupon Rate	Preference dividend payable on preference share
Issue price	Can be issued at par, premium or discount. Issue will be at par if problem is silent
Redeemable value	Can be redeemed at par, premium or discount. Redemption will be at par if problem is silent
Preference Dividend	Face value x Coupon Rate

$$\text{Cost of irredeemable preference } (K_p) = \frac{\text{Preference Dividend}}{\text{Net proceeds}}$$

$$\text{Cost of redeemable preference } (K_p) = \frac{\text{Preference Dividend} + \text{Average other costs}}{\text{Average Funds Employed}}$$

Where

$$\text{Average other costs} = \frac{\text{Redeemable value} - \text{Net Proceeds}}{\text{Balance life}}$$

$$\text{Average Funds employed} = \frac{\text{Redeemable value} + \text{Net Proceeds}}{2}$$

Example:

A company recently issued 9% preferred shares. The preferred shares sold for Rs. 40 a share with a par of Rs. 20. The cost of issuing the stock was Rs. 5 a share. What is the company's cost of preferred share

a) 9%
b) 4.5%
c) 5.1%
d) 10.3%

Answer:

$K_p = \frac{1.8}{40 - 5} = 5.1\%$

13. Weighted Average Cost of Capital (WACC)

- WACC is the single cost for the entire capital structure of the company. This is the discount rate used in capital budgeting evaluation
- WACC can be called as the minimum return required by the company on its investments

Steps:

- **Step 1:** Compute cost of individual components of capital
- **Step 2:** Compute WACC using below format

Source	Cost	Weight		Product	
		Book value	Market value	Book value	Market value

$$\textbf{WACC} = \frac{\textbf{Sum of Products}}{\textbf{Sum of weights}} \textbf{ x 100}$$

Example:

Debt as a percentage of the total capital of Kinara Ltd. is 20%. Its cost of equity is 16% and the pre-tax cost of debt is 12%. The tax rate is 50%. What is the overall cost of capital of Kinara Ltd.?

a. 16%
b. 14%
c. 15.2%
d. 16.6%

Answer:

WACC = [16 x 80%] + [6 x 20%] = 14.00%

Example:

Baba Ltd. has a cost of equity of 12%, a pre-tax cost of debt of 7%, and a tax rate of 35%. What is the firm's weighted average cost of capital if the debt-equity ratio is 0.60?

a. 9.21%
b. 10.01%
c. 10.13%
d. 11.11%

Answer:

Source	Cost	Weight	Product
Equity	12	100	1,200
Debt	4.55	60	273
Overall	**9.21**	160	1,473

Example:

Black & White Ltd. has a cost of equity of 11% and a pre-tax cost of debt of 8.5%. The firm's target weighted average cost of capital is 9% and its tax rate is 35%. What is the firm's target debt-equity ratio?

a. 0.6203
b. 0.3653
c. 0.5756
d. 0.5572

Answer:

Let us assume weight of debt to be A and equity to be B. Overall weight has been assumed as 100

Source	Cost	Weight	Product
Debt	5.525	A	5.525A
Equity	11	B	11B
Overall	**9.00**	100	900

Equations:

- A + B = 100
- 5.525A + 11B = 900
- Solving above equations we get, A = 36.53 and B = 63.47

Debt equity ratio $= \frac{36.53}{63.47} = \mathbf{0.5756}$

Example:

A company's debt equity ratio is 3:5. Pretax cost of debt and equity are 7% and 10% respectively. What is the weighted average cost of capital if the tax rate is 30%?

a) 12.21%
b) 17%
c) 14.9%
d) 8.09%

Answer:

8.09%

Source	Cost	Weight	Product
Equity	10	5	50
Debt	4.9	3	14.7
Overall	**8.09**	8	64.7

14. Ex-interest vs Cum-interest values

- In market financial security will always quote at cum-interest/dividend value. This is because an investor buying the instrument gets the instrument as well as the benefit of accrued interest/dividend
- For computing individual components of capital we should always use ex-interest values in the formulae

Example:

8% preference shares of face value Rs.25 is currently quoted at Rs.18 cum-dividend. How much is the cost of preference?

a. 8.00%
b. 11.11%
c. 12.50%
d. 10.00%

Answer:

$$\text{Cost of preference} = \frac{25 \text{ x } 8\%}{16} x\ 100 = 12.50\%$$

Note: Ex-dividend price is to be used as net proceeds and the same is Rs.16 (18 – 2)

15. Market value of equity and retained earnings

- Stock market does not separately value retained earnings of a company. It give a single value for equity share which combines equity and reserves value
- For doing WACC based on market value, market value of equity shares should be split between equity and retained earnings in the ratio of their book values

Example:

Cost of equity of a company is 10.41% while cost of retained earnings is 10%. There are 50,000 equity shares of Rs.10 each and retained earnings of Rs.15,00,000. Market price per equity share is Rs.50. Calculate WACC using market value weights if there are no other sources of finance.

a. 10.41%
b. 10.00%
c. 10.21%
d. 10.10%

Answer:

Answer:

Source	Cost	Weight	Product
Equity capital	10.41%	6,25,000	65,063
Retained earnings	10.00%	18,75,000	1,87,500
Total		**25,00,000**	**2,52,563**

Note:

- Market value of equity shares = 50,000 x 50 = Rs.25,00,000
- Value needs to be split between equity capital and retained earnings in the ratio of book values (5,00,000:15,00,000 (or) 1:3)

$$\text{WACC} = \frac{\text{Sum of Products}}{\text{Sum of weights}} = \frac{2,52,563}{25,00,000} x\ 100 = \mathbf{10.10\%}$$

16. Issue Price vs Current Market Price

- For computing cost of individual components of capital, we should always give preference to issue price (and not market price) for computing net proceeds/P0 in Ke
- Issue price can be taken as par (or) as CMP depending on assumption

17. Cost of debt/preference in case of no additional information

- Cost of debt = Interest rate x (1 – Tax rate)
- Cost of preference = Coupon rate

Example:

A company plans to raise Rs.4,00,000 in the form of debt. It will raise 10% debt of Rs.1,80,000 and balance of 16% debt. Tax rate is 50%. How much is the post-tax average cost of debt?

a. 6.50%
b. 13.00%
c. 13.30%
d. 6.65%

Answer:

- Cost of 10% debt = 10% x (1 – 50%) = 5.00%
- Cost of 16% debt = 16% x (1 – 50%) = 8.00%

$$\text{Average cost of debt} = \frac{(5 \text{ x } 1.8) + (8 \text{ x } 2.2)}{1.8 + 2.2} = 6.65\%$$

18. Issue price of debenture when market yield is given

$$\text{Issue price} = \frac{\text{Interest per debenture before tax}}{\text{Investor yield before tax}}$$

Example:

The company proposes to issue 11-year 15% debentures but the yield on similar maturity and risk class is 16%. Face value of debentures is Rs.100. What would be the issue price?

a. Rs.100.00
b. Rs.106.67
c. Rs.93.75
d. Rs.90.00

Answer:

- The company pays interest rate of 15% whereas investors are expecting return of 16%
- The company is not meeting the expectations of investors. Hence the issue has to happen at discount

$$\textbf{Issue price} = \frac{\textbf{Interest}}{\textbf{Investor expectation}} = \frac{\textbf{100 x 15\%}}{\textbf{16\%}} = \textbf{Rs. 93.75}$$

19. Impact of additional capital on existing cost

- A company may raise additional capital in the form of debt/equity/preference. These can change the expectations of existing capital providers due to increased/decreased risk
- These changes will have to be reflected in the cost of existing capital and ultimately in WACC

20. Weighted Marginal Cost of Capital (WMCC)

- WMCC is the cost of raising additional capital. Hence for WMCC calculation we should consider only the new capital (debt/equity/preference/retained earnings) and its cost should be considered
- WMCC will be the same under book value/market value approach. This is because market value of capital raised will be equal to book value of capital raised

Example:

Ganesh Ltd. requires an amount of ₹ 5,00,000 to finance a project. It was decided to raise such finance by the issue of debentures. Cost of debt is 10% (before tax) up to ₹ 2,00,000 and 13% (before tax) beyond that. The tax rate is 30%. What is the average marginal cost of capital of new finance of ₹ 5,00,000?

a. 7.37%

b. 11.80%
c. 8.26%
d. 9.12%

Answer:

Source	Cost	Weight	Product
10% debt	7.00%	2,00,000	14,000
13% debt	9.10%	3,00,000	27,300
Overall	**8.26**	5,00,000	41,300

21. Cost of Equity with PE Multiple

$$\text{PE Multiple} = \frac{\text{Price}}{\text{Earnings}}$$

$$\frac{1}{\text{PE Multiple}} = \frac{\text{Earnings}}{\text{Price}} = K_e$$

- In short Ke can be taken as inverse of PE Multiple if data about others methods is not available

22. Optimum capital structure and maximum capex with retained earnings

- An optimum capital structure is one which minimizes cost of capital. The company will raise any fresh capital in the same proportion. Hence in this situation, WMCC = WACC

$$\text{Maximum capex with retained earnings} = \frac{\text{Available retained earnings}}{\text{Weight of equity in optimum captial structure}}$$

Example:

A company's optimal capital structure consist of 60% equity and 40% debt. The company currently has retained earnings of Rs.10,00,000. How much capital expenditure can be done by the company without issuing new equity shares?

a. Rs.6,00,000
b. Rs.10,00,000
c. Rs.16,66,667
d. Rs.20,00,000

Answer:

$$\text{Amount of capex} = \frac{10,00,000}{60\%} = \text{Rs. } 16,66,667$$

Chapter 5 – Financing Decisions – Capital Structure

1. Introduction

- Capital = Long-term money = Equity + Long-term debt + Preference
- Capital structure refers to the composition of debt, equity and preference
- Optimum capital structure is one which minimizes cost of capital (or) maximizes value of firm

2. Format for computation of value of firm

Particulars	Amount
Earnings before interest and tax	XXX
Less: Interest	(XXX)
Earning before tax	**XXX**
Less: Tax	(XXX)
Earning after tax	**XXX**
Less: Preference Dividend	(XXX)
Earning available to equity shareholders (A)	**XXX**
No of equity shares (B)	XXX
Earning per share (A/B)	**XXX**
Price-earning multiple	XXX
Market price per share (EPS x PE Multiple)	**XXX**
No of equity shares	XXX
Market value of equity (MPS x No of shares)	**XXX**
Market value of preference	XXX
Market value of debt	XXX
Market value of firm (Eq + Preference + Debt)	**XXX**

3. Steps for evaluation of best mix

- **Step 1:** Identify the various alternatives
- **Step 2:** Compute interest, preference dividend and number of equity shares for each alternative
- **Step 3:** Compute EPS (or) Market value of firm and decide the optimum mix. An optimum mix is one which maximizes EPS/MV of firm

Example:

The company currently has debentures of Rs.4,00,000, reserves of Rs.7,00,000 and Rs.3,00,000 of equity share capital. The company is planning to raise Rs.4,00,000 by debt. PE Multiple of the company will decline by 20% if the debt ratio is higher than 40%. The existing EPS is Rs.4 and MPS is Rs.20. How much would be the PE Multiple post expansion?

a. 5 Times
b. 4 Times
c. 6 Times
d. 10 Times

Answer:

PE Multiple of 4 Times

Particulars	Amount
Debt	8,00,000
Equity	10,00,000 [7,00,000 + 3,00,000]
Total capital employed [Debt + Equity]	18,00,000
Debt Ratio $= \frac{\text{Debt}}{\text{Debt + Equity}}$	44.44%
Applicable PE Multiple	**5 x 80% = 4 Times**

Example:

The funds can be borrowed at the rate of 10% upto Rs.2,50,000, at 15% over Rs.2,50,000 and upto 10,00,000 and at 20% over Rs.10,00,000. The company plans to borrow Rs.15 lacs. How much is the total interest cost if the interest rate specified is slab rates?

a. Rs.3,00,000

b. Rs.2,25,000
c. Rs.2,37,500
d. Rs.2,50,000

Answer:

Interest cost = (2,50,000 x 10%) + (7,50,000 x 15%) + (5,00,000 x 20%) = Rs.2,37,500

4. ROI/ROCE and EBIT Linkage

- Operating profit (EBIT) depends on return on investment (ROI) and the amount invested (capital = debt + Equity + Preference)
- Overall EBIT can increase due to higher ROI (or) higher investment. Hence any problem involving new capital investment will lead to an increase in EBIT

$$\text{ROI (or)ROCE} = \frac{\text{EBIT}}{\text{Debt} + \text{Equity} + \text{Preference}} \text{ x } 100$$

Example:

The company has paid interest of Rs.3,60,000 for year ending 31.03.2019 on 10% debentures which were issued on 1.8.2018. How much is the amount of debentures issued?

e. Rs.36,00,000
f. Rs.54,00,000
g. Rs.24,00,000
h. Rs.60,00,000

Answer:

- Interest on debentures is Rs.3,60,000 for 8 months. Hence the cost for the full year on debentures will be Rs.5,40,000
- **Amount of debentures = (5,40,000/10%) = Rs.54,00,000**

Example:

The company earned EBIT of Rs.23,00,000. Existing capital includes Rs.10,00,000 of debentures, Rs.20,00,000 of Long-term loan, Rs.20 lacs of reserves and surplus and Rs.50,00,000 of equity share capital. The company plans to raise Rs.30,00,000 to pay-off debentures and modernize its plants. How much is the new EBIT if ROI will improve by 2 percent?

a. Rs.23,46,000
b. Rs.32,50,000
c. Rs.23,00,000
d. Rs.30,00,000

Answer:

New EBIT = Rs.30,00,000

Particulars	**Existing**	**Revised**
EBIT	23,00,000	30,00,000 (25% x 1,20,00,000)
Capital employed:	**1,00,00,000**	**1,20,00,000**
Equity capital	50,00,000	50,00,000
Reserves and surplus	20,00,000	20,00,000
Debentures	10,00,000	-
Term loan	20,00,000	20,00,000
New capital introduced	0	30,00,000
ROI (EBIT/CE)	**23.00%** **[23,00,000/1,00,00,000] x 100**	**25.00%** **[23.00% + 2.00%]**

Example:

The company is earning PBT of Rs.3,00,000 after meeting interest liability on 12% debentures. Interest paid is Rs.1,20,000. The company has equity and reserves of Rs.20,00,000. The company is raising additional capital of Rs.5,00,000 and the rate of return will increase by 2%. How much is the new EBIT?

a. Rs.4,20,000
b. Rs.5,60,000
c. Rs.6,00,000
d. Rs.8,00,000

Answer:

$$\text{Existing ROI} = \frac{3,00,000 + 1,20,000}{10,00,000 + 20,00,000} x\ 100 = 14.00\%$$

New EBIT = New ROI x New investment = 16.00% x 35,00,000 = Rs.5,60,000

5. EPS vs MV of Firm Maximization

- Question specifies what needs to be maximized – Please follow the same
- Problem is silent – PE Multiple not given – Select alternative which maximizes EPS
- Problem is silent – PE Multiple given – Select alternative which maximizes market value of firm

6. Indifference Point

- Indifferent point is the level of EBIT at which two alternatives will give same EPS. One of the plans would be better above indifference point and the other plan would be better below indifference point

Steps:

- **Step 1:** Identify the various alternatives
- **Step 2:** Compute interest, preference dividend and number of equity shares for each alternative
- **Step 3:** Assume EBIT as X and compute EPS in terms of X. Equate EPS of two plans and solve X. The solved number is the indifferent point

Example:

Financial Plan 1 has interest cost of Rs.20,00,000 and no of equity shares of 10,00,000 whereas Financial Plan 2 has interest cost of Rs.30,00,000 and no of equity shares of 5,00,000 shares. Tax rate is 40 percent. How much is the indifference point between Plan 1 and 2?

a. Rs.20,00,000
b. Rs.30,00,000
c. Rs.40,00,000
d. Rs.50,00,000

Answer:

Particulars	**Plan 1**	**Plan 2**
EBIT	X	X
Less: Interest	-20,00,000	-30,00,000
EBT	**X – 20,00,000**	**X – 30,00,000**
Less: Tax	0.5X – 10,00,000	0.5X – 15,00,000
EAT	**0.5X – 10,00,000**	**0.5X – 15,00,000**
Less: Preference dividend	0	0
EAES	**0.5X – 10,00,000**	**0.5X – 15,00,000**
No of shares	10,00,000	5,00,000
EPS (EAES/No of shares)	$\frac{0.5X - 10,00,000}{10,00,000}$	$\frac{(0.5X - 15,00,000)}{5,00,000}$

$\frac{0.5X - 10,00,000}{10,00,000} = \frac{0.5X - 15,00,000}{5,00,000}; 0.5X - 10,00,000 = X - 30,00,000; X = 40,00,000$

- **Indifference Point = Rs.40,00,000**

Example:

EPS of Plan 1 with EBIT of Rs.4,00,000 is Rs.10 per share. Indifference point between Plan 1 and 2 is Rs.4,00,000. Plan 2 has 20,000 equity shares and preference capital of Rs.10,00,000. Tax rate is 30%. How much is the rate of preference Dividend?

a. 8%
b. 20%
c. 12%
d. 10%

Answer:

Particulars	**Amount**
EBIT	4,00,000
Less: Interest	0
EBT	4,00,000
Less: Tax @ 30%	-1,20,000
EAT	**2,80,000**
Less: PD (b/f)	-80,000

EAES	**2,00,000**
No of equity shares	20,000
EPS (2,00,000/20,000)	**10.00**

Rate of preference Dividend = (80,000/10,00,000) x 100 = 8%

Example:

The number of indifference points possible between 5 financial plans are

a) 5
b) 8
c) 3
d) 10

Answer:

10

Explanation: 4 between Plan 1 and others + 3 between Plan 2 and others + 2 between Plan 3 and others + 1 between Plan 4 and others = 10 Plans

7. Financial Break-even Point

- Financial BEP is the level of EBIT at which EPS is zero

$$\text{Financial BEP} = \text{Interest} + \left(\frac{\text{Preference Dividend}}{1 - \text{Tax Rate}}\right)$$

Selection of Alternative:

- We compute indifferent point by equating EPS of two alternatives. In some scenario, we will not get an answer for indifference point and this would mean one plan is dominating another plan. **A plan with low financial BEP dominates a plan with high financial BEP**. We should ignore the plan getting dominated while selecting the alternative
- Among the balance plans, the selection rule would be as under:
  - Select a plan having low financial BEP, when EBIT is below indifference point
  - Select a plan having high financial BEP, when EBIT is above indifference point

Example:

Interest cost of Plan 1 is Rs.20,00,000 and Preference Dividend is Rs.6,00,000. Tax rate is 25%. How much is the financial break-even point?

a. Rs.26,00,000
b. Rs.27,50,000
c. Rs.28,00,000
d. Rs.30,00,000

Answer:

$$\text{Financial BEP} = \text{Interest} + \frac{\text{Preference Dividend}}{1 - \text{Tax Rate}} = 20,00,000 + \frac{6,00,000}{1 - 0.25} = 28,00,000$$

Example:

Financial BEP of Plan 1 is Rs.10,00,000 and Financial BEP of Plan 2 is Rs.8,00,000. Indifference point between Plan 1 and 2 is Rs.12,00,000. Which financial Plan should be selected if EBIT is Rs.10,00,000?

a. Plan 1
b. Plan 2
c. Either of Plan 1 or Plan 2
d. Neither Plan1 nor Plan 2

Answer:

Plan 2

Explanation: We should select a plan with lower financial BEP when EBIT is below indifference point.

Example:

There exists no indifference point between financial plan 2 and 3. Financial BEP of Plan 2 is Rs.20,00,000 and Financial BEP of Plan 3 is Rs.10,00,000. Which of the following is true?

a. Plan 2 EPS will be equal to Plan 3 EPS at all levels of EBIT
b. Plan 2 EPS will always be higher than EPS of Plan 3
c. Plan 3 EPS will always be higher than EPS of Plan 2

Answer:

Plan 3 dominates Plan 2 as it has low financial BEP and hence **EPS of Plan 3 will always be higher than EPS of Plan 2**

8. Capital structure theories – Common Assumptions

- There are only two forms of capital (Debt and equity)
- All earnings of the company are distributed as dividend
- No concept of floatation costs or other expenses
- Taxes do not exist – However this assumption was later changed in one of the theories
- Cost of equity will always be higher than cost of debt

9. Net Income Approach

- **Conclusion:** Cost of capital will change with change in capital structure. As we replace costlier equity with cheaper debt, Cost of capital will decline and hence value of firm will increase

Specific assumptions:

- Cost of debt is constant irrespective of leverage
- Cost of equity is constant irrespective of leverage

10. Net Operating Income Approach (NOI = No Change in WACC)

- **Conclusion:** Cost of capital/Value of firm does not change with change in capital structure. This is because cost of equity will increase with additional debt leading to constant cost of capital

Specific assumptions:

- Cost of equity will increase with the increase in debt in capital structure

11. Format for solving capital structure theory questions [Without tax]

Particulars	Amount
EBIT	XXX
Less: Interest	(XXX)
EBT/EAT/EAES/Dividend	XXX
Cost of debt	XXX
Cost of equity	XXX
Cost of capital	XXX
Value of debt	XXX
Value of equity	XXX
Value of firm	XXX

$$\text{Cost of debt} = \frac{\text{Interest}}{\text{Value of debt}}$$

$$\text{Cost of equity} = \frac{\text{EBT}}{\text{Value of equity}}$$

$$\text{Cost of capital} = \frac{\text{EBIT}}{\text{Value of Firm}}$$

Example:

Cost of debt is 8% and cost of equity is 14%. Currently the firm has Rs.10,00,000 of debt and Rs.10,00,000 of equity. How much is the EBIT of the company?

a. Rs.2,00,000
b. Rs.1,60,000
c. Rs.2,80,000
d. Rs.2,20,000

Answer:

- EBIT = Interest + EBT
- EBIT = (10,00,000 x 8%) + (10,00,000 x 14%) = **Rs.2,20,000**

Example:

EBIT = Rs.5,00,000. The company has 10% 20 lac debentures and cost of equity is 15%. How much is the value of firm?

a. Rs.33,33,333
b. Rs.40,00,000
c. Rs.50,00,000
d. Rs.20,00,000

Answer:

Particulars	Amount
EBIT [Given]	5,00,000
Less: Interest	-2,00,000 [20,00,000 x 10%]
EBT	3,00,000
Cost of debt [Given]	10.00%
Cost of equity [Given]	15.00%
Value of debt [Given]	20,00,000
Value of equity	20,00,000 [3,00,000/15.00%]
Value of firm	**40,00,000**

12. MM Approach (Modigilani Miller Approach)

MM Approach without taxes:

- Same conclusion and specific assumption as that of NOI Approach
- Two companies having same EBIT and same business should command same value. If the values are different, it will lead to arbitrage opportunities. Investors will buy under-valued firm and sell over-valued firm so that the value reaches parity

MM Approach with Tax:

- Income tax leads to tax savings on interest paid. Hence the value of levered firm (with debt) would be higher than value of unlevered firm (zero debt)
- Value of levered firm = Value of unlevered firm + (Amount of debt x Tax Rate)

Format:

Particulars	Amount
EBIT	XXX
Less: Interest	(XXX)
EBT	XXX
Less: Tax	(XXX)
EAT/EAES/Dividend	XXX
Cost of debt	XXX
Cost of equity	XXX
Cost of capital	XXX
Value of debt	XXX
Value of equity	XXX
Value of firm	XXX

Formula:

$$\text{Cost of debt} = \frac{\text{Interest x } (1 - \text{Tax})}{\text{Value of debt}}$$

$$\text{Cost of equity} = \frac{\text{EBT x } (1 - \text{Tax})}{\text{Value of equity}}$$

$$\text{Cost of capital} = \frac{\text{EBIT x } (1 - \text{Tax})}{\text{Value of Firm}}$$

Example:

EBIT of unlevered company = Rs.10,00,000; Cost of equity = 10%; Tax rate = 40%; The company will buyback 20% of existing equity with debt. How much is the value of company post buyback?

a. 1,00,00,000
b. 60,00,000
c. 64,80,000
d. 1,08,00,000

Answer:

Value of equity $= \frac{6,00,000}{10\%} = \text{Rs. } 60,00,000$

Value of firm post buyback = 60,00,000 + (12,00,000 x 40%) = **Rs.64,80,000**

Example:

Ram Verse Ltd is an all equity financed company. It is considering replacing Rs. 275 lakhs equity shares with 15% debentures of the same amount. Current Market value of the company is 1750 lakhs with cost of capital at 20%. Future EBITs are going to be constant and entire earnings are going to be distributed. Corporate Tax Rate can be assumed to be 30%. What will be the new market value of the firm?

a. Rs.1832.50 lacs
b. Rs.82.50 lacs
c. Rs.1750 lacs
d. Rs1732.50 lacs

Answer:

Rs.1832.50 lacs

Explanation: Value (L)= Value (UL)+ Debt x t =1750+275 x 30%=1832.5 lacs

13. Relationship between Cost of equity/Cost of capital of two similar firms: [Without tax]

- Net income approach = Same cost of equity for two companies + Different cost of capital
- NOI/MM = Same cost of capital for two companies + Different cost of equity
- Traditional = Both may change and would be given in question

Example:

_____ is constant under net income approach and _____ is constant under net operating income approach

a. Cost of equity and cost of capital
b. Cost of capital and cost of capital
c. Cost of equity and cost of equity
d. Cost of capital and cost of equity

Answer:

Cost of equity and cost of capital

14. Arbitrage

- Arbitrage means making extra-ordinary profits without any increase in risk
- Two firms with similar risk and EBIT should have same value of firm. If the values are different then arbitrage opportunity opens up

Types of Arbitrages:

- Primary Arbitrage = Value of levered firm > Value of unlevered firm
- Reverse Arbitrage = Value of unlevered firm > Value of levered firm
- No arbitrage = Value of levered firm = Value of unlevered firm

Steps in case of Primary Arbitrage:

- **Step 1:** Check whether arbitrage exist by computing value of firms
- **Step 2:** Compute present earnings of the investor by assuming 10% investment in the company having higher value
- **Step 3:** Sell holdings in levered company + Borrow in line with corporate leverage + Invest in unlevered company
- **Step 4:** Compute new earnings of investor
- Arbitrage gain is confirmed if earnings increase (or) earnings remain same with surplus cash

Steps in case of Reverse Arbitrage:

- **Step 1:** Same
- **Step 2:** Same
- **Step 3:** Sell holdings in unlevered company + Invest in debt as well as equity of levered company
- **Step 4:** Same
- Arbitrage gain is confirmed if earnings increase (or) earnings remain same with surplus cash

Chapter 6 – Financing Decisions - Leverages

1. Introduction

- Leverage indicates that the reward (EPS) is going to be disproportionate to the efforts taken (sales)
- Leverage can arise either due to operations (operating leverage) or capital structure (financial leverage)

2. Operating Leverage

- Operating leverage arises due to fixed cost in cost structure. A company with high fixed cost will have high operating leverage and vice versa

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} \text{ (or) } \frac{\%\text{ change in EBIT}}{\%\text{ change in sales}} \text{ (or) } \frac{1}{\text{MOS}}$$

Interpretation of OL:

- OL of 5 times would mean that if sales change by 1 percent, EBIT will change in 5 percent

Example:

Operating leverage is 7 and financial leverage is 2.2858. How much change in sales will be required to bring 70% change in EBIT?

a) 10%
b) 70%
c) 11.429%
d) 30%

Answer:

10%

$$\text{OL} = \frac{\%\text{ change in EBIT}}{\%\text{ change in sales}}; 7 = \frac{70\%}{\%\text{ change in sales}}; \%\text{ change in sales} = 10\%$$

Example:

Given

Operating Fixed Costs	Rs.20,000
Sales	Rs.1,00,000
PV Ratio	40%

The operating leverage is:

a) 2.00
b) 2.50
c) 2.67
d) 2.47

Answer:

2.00

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{40{,}000}{20{,}000} = 2 \text{ Times}$$

Example:

If operating leverage is 4, this means that

a. 4% change in sales will cause a 1% change in EBIT.
b. 1% change in sales will cause a 4% change in EBIT.
c. 1% change in sales will cause a 4% change in EPS.
d. 4% change in sales will cause a 1% change in EPS

Answer:

1% change in sales will cause 1 4% change in EBIT

Example:

Existing sales = Rs.24,00,000; Existing EBIT = Rs.2,00,000; OL = 6 Times. How much would be the new EBIT if sales increase by Rs.6,00,000?

a. Rs.2,00,000
b. Rs.3,00,000
c. Rs.4,00,000
d. Rs.5,00,000

Answer:

Rs.5,00,000

- % increase in sales = (6,00,000/24,00,000) x 100 = 25.00%

- % increase in EBIT = 25.00% x 6 Times = 150.00%
- New EBIT = 2,00,000 + 150% = Rs.5,00,000

Example:

X Limited has estimated that for a new product its break-even point is 20,000 units if the item is sold for Rs.14 per unit and variable cost Rs.9 per unit. Calculate the degree of operating leverage for sales volume 25,000 units

a. 4 Times
b. 3 Times
c. 6 Times
d. 5 Times

Answer:

Particulars	25,000 units
Sales	3,50,000
Less: Variable cost	-2,25,000
Contribution	**1,25,000**
Less: Fixed cost (BEP x CPU)	-1,00,000
EBIT	**25,000**
Operating leverage	**5 Times**

Example:

If Margin of Safety is 0.25 and there is 8% increase in output, then EBIT will be:

a) Decrease by 2%
b) Increase by 32%
c) Increase by 2%
d) Decrease by 32%

Answer:

Increase by 32%

$$OL = \frac{1}{MOS} = \frac{1}{0.25} = 4 \text{ Times}$$

$$\text{Change in EBIT} = OL \text{ x Change in sales} = 4 \text{ x } 8\% = 32.00\%$$

Example:

If there is a 10% increase in sales, EBIT increases by 35% and if sales increase by 6%, taxable income will increase by 24%. Operating leverage must be

a. 1.15
b. 3.50
c. 4.00
d. 2.67

Answer:

$$OL = \frac{\%\text{ change in EBIT}}{\%\text{ change in sales}} = \frac{35}{10} = \mathbf{3.50\ Times}$$

Example:

Given Data: Sales is Rs.10,00,000, Break even sales is Rs.6,00,000. What is the Degree of operating leverage?

a. 3 Times
b. 2 Times
c. 2.5 Times
d. 2.2 Times

Answer:

- BEP = 60% of sales; MOS = 40% of sales
- DOL = 1/MOS = 1/0.40 = **2.50 Times**

3. Financial Leverage

- Financial leverage arises due to fixed capital in capital structure. A company with high fixed capital will have high financial leverage and vice versa

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBT} - \left(\frac{\text{PD}}{1 - \text{Tax rate}}\right)} \text{ (or) } \frac{\%\text{ change in EPS}}{\%\text{ change in EBIT}}$$

Interpretation of FL:

- FL of 5 times would mean that if EBIT change by 1 percent, EPS will change in 5 percent

Example:

If degree of financial leverage is 3 and there is 15% increase in Earning per share (EPS), then EBIT will be

a) Decrease by 15%
b) Increase by 45%
c) Decrease by 45%
d) Increase by 5%

Answer:

Increase by 5%

$$\text{Financial leverage} = \frac{\%\text{ change in EPS}}{\%\text{ change in EBIT}}$$

$$3 = \frac{15\%}{\%\text{ change in EBIT}}; \textbf{\% change in EBIT} = \textbf{5\%}$$

Example:

Operating profit = 20,00,000; 12% debt of Rs.12,50,000 and 12% preference capital of Rs.12,50,000. Tax rate is 40%. How much is Financial Leverage?

a. 1.17 Times
b. 1.08 Times
c. 1.33 Times
d. 1.25 Times

Answer:

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBT} - \left(\frac{\text{PD}}{1 - \text{Tax rate}}\right)} = \frac{20,00,000}{18,50,000 - \left(\frac{1,50,000}{1 - 0.4}\right)} = \frac{20,00,000}{16,00,000} = 1.25 \text{ Times}$$

Example:

If EBIT is Rs. 15,00,000, interest is Rs. 2,50,000, corporate tax is 40%, degree of financial leverage is;

a) 1.11
b) 1.20
c) 1.31
d) 1.41

Answer:

1.20

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{15,00,000}{12,50,000} = 1.20 \text{ Times}$$

Example:

Financial Leverage = 1.5465 Times; EBIT = Rs.1,38,000; Interest = Rs.18,000; Tax rate = 35%. How much is the amount of preference Dividend?

a. Rs.19,950
b. Rs.19,898
c. Rs.20,000
d. Rs.19,000

Answer:

Rs.20,000

$$1.5465 = \frac{1,38,000}{1,20,000 - \left(\frac{\text{PD}}{0.65}\right)}; \textbf{Solving we get PD} = \textbf{20,000}$$

Example:

"If EBIT increases by 6%, net profit increases by 6.9%. If sales increase by 6%, net profit will increase by 24%. Financial leverage must be -……."

a. 1.19
b. 1.13
c. 1.12
d. 1.15

Answer:

$$\text{FL} = \frac{\%\text{ change in NP}}{\%\text{ change in EBIT}} = \frac{6.9}{6} = 1.15 \text{ Times}$$

4. Combined Leverage

- Combination of OL and FL

$$\text{Combined leverage} = \text{OL x FL (or)} \frac{\text{Contribution}}{\text{EBT} - \left(\frac{\text{PD}}{1 - \text{Tax rate}}\right)} \text{ (or) } \frac{\text{(\% change in EPS)}}{\text{\% change in Sales}}$$

Interpretation of CL:

- CL of 5 times would mean that if sales change by 1 percent, EPS will change in 5 percent

Example:

From the following information, calculate combined leverage:

Sales	Rs.20,00,000
Variable Cost	40%
Fixed Cost	Rs.10,00,000
Borrowings	Rs.10,00,000 @ 8% p.a.

a) 10 times
b) 6 times
c) 1.667 times
d) 0.10 times

Answer:

10 Times

$$\text{Combined leverage} = \frac{\text{Contribution}}{\text{EBT}} = \frac{12,00,000}{1,20,000} = 10 \text{ Times}$$

Example:

Combined leverage of 10 times would mean that if _____ increase by 1% then _____ will increase by 0.1%

a. Sales, EPS
b. EPS, Sales
c. Sales, EBIT
d. EBIT, Sales

Answer:

EPS, Sales

Example:

How much is the combined leverage if EBIT = Rs.31,50,000, EBT = Rs.14,00,000 and fixed operating cost is Rs.1,57,500.

a. 2.3625 Times
b. 2 Times
c. 2.25 Times
d. 2.10 Times

Answer:

$$\text{Combined leverage} = \frac{\text{Contribution}}{\text{EBT} - \left(\frac{\text{PD}}{1 - \text{Tax rate}}\right)} = \frac{\text{EBIT} + \text{Fixed Cost}}{14,00,000 - 0} = \frac{31,50,000 + 1,57,500}{14,00,000} = \mathbf{2.3625}$$

Example:

Financial leverage = 3 Times; 25% decline in sales will wipe out entire EPS. How much is the operating leverage?

a. 8.33 Times
b. 33.33 Times
c. 1.33 Times
d. 12.00 Times

Answer:

1.33 Times

- 25% decline in sales will lead to 100% decline in EPS and hence combined leverage is 4 Times
- Operating Leverage = (CL/FL) = (4/3) = 1.33 Times

Example:

OL =2 Times; FL = 3 Times. How much is the percentage change in taxable income for 10% increase in sales?

a. 20%
b. 30%
c. 60%
d. 15%

Answer:

- Combined leverage measures the relationship between increase in taxable income (PBT) and sales

- Combined leverage = 2 x 3 = 6 Times
- Hence PBT will increase by 60% for 10% increase in sales

5. Format for computation of Leverages

Particulars	Amount
Sales	XXX
Less: Variable costs	(XXX)
Contribution	**XXX**
Less: Fixed cost	(XXX)
EBIT	**XXX**
Less: Interest	(XXX)
EBT	**XXX**
Less: Tax	(XXX)
EAT	**XXX**
Less: Preference Dividend	(XXX)
EAES	**XXX**
No of equity shares	XXX
EPS	**XXX**

Example:

Financial Leverage = 3 Times; Interest = Rs.200. How much is EBIT?

a. Rs.600
b. Rs.300
c. Rs.400
d. Rs.100

Answer:

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBT}}$$

$$3 = \frac{X}{X - 200}; 3X - 600 = X; 2X = 600; \mathbf{X = 300}$$

Example:

Total assets of Alpha Company are ₹ 3,00,000. The company's total assets turnover ratio is 3, its fixed operating cost is ₹ 1,50,000 and its variable operating cost ratio is 50%. The income-tax rate is 50%. It also has long term debts of ₹ 1,20,000 on which interest @ 10% is payable. Operating, Financial & Combined Leverages of the company are –

a) 1.5; 1.042; 1.563 respectively
b) 1.05; 1.42; 1.05625 respectively
c) 1.50; 1.42; 2.13 respectively
d) 1.55; 1.042; 1.6151 respectively

Answer:

1.5; 1.042; 1.563 respectively

Particulars	Amount
Sales	9,00,000
Less: Variable cost	-4,50,000
Contribution	**4,50,000**
Less: Fixed cost	-1,50,000
EBIT	**3,00,000**
Less: Interest	-12,000
EBT	**2,88,000**
OL (Contribution/EBIT)	1.50
FL (EBIT/EBT)	1.042
CL (Contribution/EBT)	1.563

Example:

Output (units) = 3,00,000 Fixed cost = ₹ 3,50,000 Unit variable cost = ₹ 1.00 Interest expenses = ₹ 25,000 Unit selling price = ₹ 3.00 Applicable tax rate is 35% Calculate Financial Leverage.

a) 1.11
b) 2.40
c) 2.67

d) 1.07

Answer:

1.11

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{2{,}50{,}000}{2{,}25{,}000} = 1.11$$

6. Net Fund Flow

Net Fund Flow = PAT + Depreciation – Equity Dividend – Preference Dividend

Example:

PAT = Rs.2,00,000; Depreciation = Rs.80,000; Equity dividends = 40% of EAES; Preference Dividend = Rs.20,000. How much is the net fund flow?

a. Rs.2,80,000
b. Rs.1,88,000
c. Rs.2,00,000
d. Rs.1,80,000

Answer:

Net fund flow = PAT + Depreciation – Equity Dividends – Preference dividends

Net fund flow = 2,00,000 + 80,000 – (40% of 1,80,000) – 20,000 = **1,88,000**

7. Return on investment and Return on equity

$$\text{Pre} - \text{tax ROI} = \frac{\text{EBIT}}{\text{Debt} + \text{Equity} + \text{Preference}}$$

$$\text{Post} - \text{tax ROI} = \frac{\text{EBIT x } (1 - \text{Tax})}{\text{Debt} + \text{Equity} + \text{Preference}}$$

$$\text{ROE} = \frac{\text{EAES}}{\text{Amount of equity}}$$

- EBT can be used as proxy if tax rate is not given

8. Favourable vs unfavourable financial leverage

- A firm has favourable financial leverage if ROI is greater than cost of debt. We should ensure consistency and compare both pre-tax values (or) post-tax values

Example:

A firm has sales of ₹ 75,00,000, variable cost of ₹ 42,00,000 and fixed cost of ₹ 6,00,000. It has a debt of ₹ 45,00,000 at 9% and equity of ₹ 55,00,000. Does it have favourable financial leverage?

a. ROI is less than interest on loan funds and hence it has no favourable financial leverage.
b. ROI is equal to interest on loan funds and hence it has favourable financial leverage.
c. ROI is greater than interest on loan funds and hence it has favourable financial leverage.
d. ROI is greater than interest on loan funds and hence it has unfavourable financial leverage.

Answer:

ROI is greater than interest on loan funds and hence it has favourable financial leverage

$$\text{ROI} = \frac{\text{EBIT}}{\text{Amount of capital employed}} = \frac{27{,}00{,}000}{45{,}00{,}000 + 55{,}00{,}000} x\ 100 = 27.00\%$$

Chapter 7A – Time Value of Money

1. Introduction

- Money has a different value based on timing of cash flow. The value of money keeps declining due to inflation aspect
- **Rs.100 received today > Rs.100 a year later**
- The time value of money can also be considered as reward for postponement of consumption of money
- **Interest rate = Inflation rate + Real return on risk-free investment + Risk Premium**

2. Future Value

- Future value is **tomorrow's value of today's money** compounded at time value of money

$$\text{Future Value} = \text{Present value x } (1 + r)^n$$

(OR)

- Future Value = Present value x Future value Factor

Example:

Ram has deposited Rs.55,650 in a bank, which is paying 15 per cent rate of interest on a ten-year time deposit. Calculate the amount at the end of ten years?

Answer:

$\text{Amount} = \text{P x } (1 + r)^n$

$\text{Amount} = 55{,}650 \text{ x } (1 + 15\%)^{10} = 55{,}650\ x\ 4.0456 = \text{Rs. } 2{,}25{,}138$

3. Present Value

- Present value is **today's value of tomorrow's money** discounted at time value of money

$$\text{Present value} = (\text{Future value})\text{x } \left(\frac{1}{(1 + r)^n}\right)$$

(OR)

- Present value = Future value x Present value Factor

Example:

Suppose you have celebrated your 19th birthday. A rich uncle of yours has set up a trust fund for you that will pay you Rs.2,50,000 when you turn 30. If the time value of money is 9.0%, how much is this fund worth today?

Answer:

$$\text{Present value} = \frac{\text{Future value}}{(1 + r)^n}$$

$$\text{Present value} = \frac{2{,}50{,}000}{(1 + 9\%)^{11}}$$

$$\text{Present value} = \frac{2{,}50{,}000}{2.580} = \text{Rs. } 96{,}899$$

4. PV/FV of Uneven Cash Flows

- Cash flow at different points of time cannot be added because money has time value
- We should bring all cash flows either to day 0 (discounting) or to maturity date (compounding). The sum of discounted value is Present value and sum of compounded values is future value

Example:

An investor will receive Rs.100 of interest for next three years and also receive Principal of Rs.1,000 at end of third year. How much is the maturity cash flow at end of year 3 if re-investment rate is 8%.

Year	Cash flow	Period	FVF $(1 + r)^n$	Future value
1	100.00	2	1.1881	118.81
2	100.00	1	1.0900	109.00
3	1,000.00	0	1.0000	1,000.00
Maturity cash flow				1,227.81

Note:

Future value factor is computing by using the formula of $(1 + r)^n$ where r = 8% and n = Number of periods of investment (Column 3)

Example:

You are likely to receive Rs.10,000 in year 1, Rs.20,000 in year 2 and Rs.30,000 in year 3. Discount rate = 10%. How much is the worth of the same today?

Year	Cash flow	PVF @10%	DCF
1	10,000	0.909	9,090
2	20,000	0.826	16,520
3	30,000	0.751	22,530
Present Value			48,140

Note:

Present value factor is computing by using the formula of $\frac{1}{(1+r)^n}$ where r = 10% and n = Number of years of discounting (Column 1)

5. PV/FV of Annuity

- Equal receipt or payment for a fixed period of time is called Annuity
- If the cash flow happens at beginning of period, it is called Annuity immediate and if the same happens at end of period it is called Annuity Regular
- If the value of these cash flows is determined at day 0, it is called present value of Annuity and if the same is determined at end of period, it is called future value of Annuity
- **If the problem is silent, then Annuity would be Annuity Regular**

Type	Future Value	Present Value
Regular	AA x FVAF (r,n)	AA x PVAF (r,n)
Immediate	AA x FVAF (r,n) x (1+r)	AA x [PVAF (r,n-1) + 1]

Example:

Compute the amount of deposit to be made today if you want to receive Rs.25,500 at the end of each of next 15 years.

Answer:

Present value = Annuity Amount x PVAF(r, n)

Present value = 25,500 x PVAF(10%, 15)

Present value = 25,500 x 7.606 = Rs. 1,93,953

6. Perpetuity

- Perpetuity would mean cash flow happening forever
- Since there is no end to perpetuity, we cannot compute future value of perpetuity

$$\text{Present value of normal perpetuity} = \frac{\text{Perpetuity Amount}}{\text{Rate of interest}}$$

$$\text{Present value of Growing perpetuity} = \frac{\text{Perpetuity Amount}}{\text{Rate of interest} - \text{Growth Rate}}$$

Example:

Assuming that the discount rate is 7% per annum, how much would you pay to receive Rs.50, growing at 5%, annually, forever?

Answer:

$$\text{Present value} = \frac{CF_1}{\text{Discount rate} - \text{Growth Rate}} = \frac{50}{7\% - 5\%} = \text{Rs. } 2{,}500$$

7. Compounding Frequency

- Compounding frequency refers to the frequency at which interest is computed on a loan/deposit
- Faster compounding frequency would increase the effective interest cost/income
- **Effective rate of interest** $= (1 + r)^n - 1$

Chapter 7B – Investment Decisions

1. Introduction

- Investment decision (or) capital budgeting refers to budgeting for capital expenditure
- Capital budgeting involves huge cash outflow today in anticipation of future cash inflows. Future is uncertain and hence an organization would like to do proper evaluation of capital expenditure. This process of evaluation is called capital budgeting

2. Payback Method

- Payback refers to the number of years taken to recover the initial investment. **It ignores time value of money**

$$\textbf{Payback} = \textbf{Base year} + \left(\frac{\textbf{Unrecovered cash flow of Base year}}{\textbf{Cash flow of next year}}\right)$$

Note: Base year refers to the last year in which cumulative cash flow is negative

Decision Rule:

- **Acceptance rule:** Accept the project if actual payback is lower than target payback
- **Choice rule:** Select an acceptable project with lower payback

Payback reciprocal:

- Inverse of payback period

$$\text{Payback reciprocal} = \frac{\text{Average annual cash flow}}{\text{Initial investment}} \text{ x } 100$$

Example:

A project is likely to generate following cash flows. Compute the payback period?

Year	Cash flow
0	-10,00,000
1	4,50,000
2	5,00,000
3	2,50,000
4	2,00,000

Answer:

Year	Cash flow	Cumulative Cash Flow
0	-10,00,000	-10,00,000
1	4,50,000	-5,50,000
2	5,00,000	-50,000
3	2,50,000	2,00,000
4	2,00,000	4,00,000

$$\text{Payback} = \text{Base Year} + \frac{\text{Unrecovered cash flow of Base Year}}{\text{Cash flow of next year}} = 2 + \frac{50,000}{2,50,000} = \mathbf{2.20\ years}$$

Example:

Rakesh Ltd. is considering investing in one of four projects for which an analyst has calculated payback period reciprocal' as 25%, 40%, 50% & 75% respectively for Project P, Q, R & S. Which project will be selected on 'payback period' method of capital budgeting?

a. Project R
b. Project P
c. Project S
d. Project Q

Answer:

$$\text{Payback period} = \frac{1}{\text{Payback Reciprocal}}$$

- Project S will have the lowest payback period and the same would be 1.33 years (1/75%)
- Project R (4 years), Project Q (2.5 years) and Project R (2 years) will be the payback period

Example:

A project requires an initial investment of Rs.20,000 and it would give annual cash inflow of Rs.4,000. The useful life of the project is estimated to be 10 years. What is payback reciprocal/Approximated IRR?

Answer:

$$\text{Payback Receiprocal} = \frac{\text{Average Cash flow}}{\text{Initial investment}}\ x\ 100 = \frac{4,000}{20,000}\ x\ 100 = 20.00\%$$

3. **Discounted Payback Method**

- Discounted payback refers to the number of years taken to recover the initial investment. **It considers time value of money**

$$\text{Discounted Payback} = \text{Base year} + \left(\frac{\text{Unrecovered discounted cash flow of base year}}{\text{Discounted cash flow of next year}}\right)$$

Note: Base year refers to the last year in which cumulative cash flow is negative

Decision Rule

- Same as Payback Method

Example:

A project is likely to generate following cash flows. Compute the discounted payback period if cost of capital is 10%?

Year	Cash flow
0	-10,00,000
1	4,50,000
2	5,00,000
3	2,50,000
4	2,00,000

Answer:

Year	Cash flow	PVF @ 10%	DCF	Cumulative DCF
0	-10,00,000	1.000	-10,00,000	-10,00,000
1	4,50,000	0.909	4,09,050	-5,90,950
2	5,00,000	0.826	4,13,000	-1,77,950
3	2,50,000	0.751	1,87,750	9,800
4	2,00,000	0.683	1,36,600	1,46,400

$$\text{Payback} = \text{Base Year} + \frac{\text{Unrecovered discounted cash flow of Base Year}}{\text{Discounted cash flow of next year}} = 2 + \frac{1,77,950}{1,87,750} = \mathbf{2.95\ years}$$

4. **Net Present Value [Most Commonly Used Method]**

- NPV is the excess of Present value of cash inflows over present value of cash outflows
- NPV = PV of cash inflows – PV of cash outflows

Decision Rule:

- **Acceptance Rule:** Accept the project with positive NPV
- **Choice Rule:** Accept the project with higher positive NPV

Example:

A project with an initial investment of Rs.50,000 generates annual cash inflows of Rs.15,000 for the next five years. The discount rate for the project is 10%. How much is the NPV of the project?

a. Rs.25,000
b. Rs.6,865
c. Rs.10,000
d. Rs.15,000

Answer:

- NPV = PV of inflows – PV of outflows
- NPV = 15,000 x PVAF (10%,5) – 50,000 = (15,000 x 3.791) – 50,000 = **Rs.6,865**

5. **Profitability Index (or) Benefit Cost Ratio (or) Present Value Index (or) Desirability factor**

- It is a ratio of PV of cash inflows (benefits) as compared to present value of cash outflow (cost)

$$\text{PI} = \frac{\text{PV of cash inflow}}{\text{PV of cash outflow}}$$

- PI can be expressed both in times and in percentage

Decision Rule:

- **Acceptance rule:** Select the project if PI > 1
- **Choice Rule:** Select an acceptable project with higher PI

Example:

NPV of the Project = Rs.2,00,000; Initial Outflow = Rs.10,00,000. How much is the Profitability Index?

a. 0.80 Times
b. 1.00 Times

c. 0.20 Times
d. 1.20 Times

Answer:

- NPV = PV of inflow – PV of outflow; 2,00,000 = PV of inflow – 10,00,000
- PV of inflow = Rs.12,00,000

$$\text{PI} = \frac{\text{PV of cash inflow}}{\text{PV of cash outflow}} = \frac{12,00,000}{10,00,000} = \mathbf{1.20\ Times}$$

Example:

Profitability index = 1.25 Times; Initial outflow = Rs.5,00,000; How much is NPV of the project?

a. Rs.1,25,000
b. Rs.6,25,000
c. Rs.4,00,000
d. Rs.1,00,000

Answer:

$$\text{Profitability index} = \frac{\text{PV of inflow}}{\text{PV of outflow}};\ 1.25 = \frac{\text{PV of inflow}}{5,00,000};\ \text{PV of inflow} = 6,25,000$$

NPV = PV of inflow – PV of outflow = 6,25,000 – 5,00,000 = **Rs.1,25,000**

6. Accounting Rate of Return

- It is the ratio of Average PAT to initial investment (or) average investment

$$\text{ARR on Initial Investment} = \frac{\text{Average PAT}}{\text{Initial Investment}} \text{ x } 100$$

$$\text{ARR on Average Investment} = \frac{\text{Average PAT}}{\text{Average Investment}} \text{ x } 100$$

$$\text{Average Investment} = \frac{\text{Opening Investment} + \text{Closing Investment}}{2}$$

Closing Investment = Salvage Value

Decision Rule:

- **Acceptance Rule:** Select a project if Actual ARR is higher than target ARR
- **Choice Rule:** Select an acceptable project with higher ARR

Example:

Initial investment = Rs.5,00,000; Salvage value = Rs.1,00,000; Average PAT = Rs.1,00,000. How much is the ARR on average investment?

1. 20.00%
2. 40.00%
3. 16.67%
4. 33.33%

Answer:

$$\text{ARR on average investment} = \frac{\text{Average PAT}}{\text{Average Investment}} x\ 100 = \frac{1,00,000}{3,00,000} x\ 100 = \mathbf{33.33\%}$$

$$\text{Average investment} = \frac{\text{Opening invt} + \text{Closing invt}}{2} = \frac{5,00,000 + 1,00,000}{2} = 3,00,000$$

7. Consolidated format for computing 5 Techniques

Year	Cash flow	Cum CF	PVF	DCF	CDCF	Depreciation	PAT
0						NA	NA
1							
2							
3							

8. Internal Rate of Return

- IRR is the rate of return earned by the project considering time value of money. This technique also focuses on cash flows
- IRR is the rate of return (Discount rate) at which **NPV of the project is zero**

NPV	IRR
Positive	IRR is greater than Discount rate

0	IRR = Discount rate
Negative	IRR is less than Discount rate

Steps in computation of IRR:

- In order to calculate IRR, it is essential to have **two discounting rates**. If these rates are provided in the question, utilize them; otherwise, it becomes necessary to make an **initial assumption or guess rate and proceed**.
- Compute the Accounting Rate of Return (ARR) based on the Average Investment. The initial guess rate can be set at **2/3 of ARR on Average Investment**
- Increase the discount rate if we get positive NPV and decrease the discount rate if we get negative NPV. Repeat step we get one positive NPV and one negative NPV

$$\text{IRR} = L_1 + \left(\frac{\text{NPV at } L_1}{\text{NPV at } L_1 - \text{NPV at } L_2} \text{ x } (L_2 - L_1)\right)$$

Note:

- L1 = Lower discount rate
- L2 = Higher discount rate

Short-method for computation of IRR:

- There is only one outflow and number of years are 2,4,8,16….then we can use the below formula $FV = PV \text{ x } (1 + r)^n$
- In the above equation, r would be equal to IRR

Future cash flows are perpetual:

$$\text{Present Value} = \frac{\text{Perpetuity Amount}}{\text{Rate of Interest} - \text{Growth Rate}}$$

Example:

NPV at discounting rate of 10% = Rs.1,250 and NPV at discounting rate of 11% = -Rs.200. IRR of the proposal is _____

a. 11.86%
b. 10.86%
c. 9.87%
d. 11.96%

Answer:

$$\text{IRR} = 10 + \frac{1{,}250}{1{,}250 - (-200)} \text{x } (11 - 10) = 10 + 0.86 = 10.86\%$$

Example:

Annual cost saving = Rs.40,000; IRR = 15%; Profitability Index = 1.064 Times; How much is the NPV of the Project?

Answer:

- IRR is the rate of return at which NPV of the project is zero
- Cost of Project = PV of inflow = 40,000 x PVAF (15%, 4 years) = 40,000 x 2.855 = Rs.1,14,200

$$\text{Profitability index} = \frac{\text{PV of inflows}}{\text{PV of outflows}}$$

$$1.064 = \frac{\text{PV of inflows}}{1{,}14{,}200}; \mathbf{PV\ of\ inflows} = (\mathbf{1,14,200\ x\ 1.064}) = \mathbf{Rs.\ 1,21,509}$$

$$\mathbf{NPV = PV\ of\ inflow - PV\ of\ outflow = 1,21,509 - 1,14,200 = Rs.\ 7,309}$$

Example:

Find the IRR of a project with a cash outflow in year 0 of Rs.50,000 and which produces cash inflows in perpetuity of Rs.8,750

a. Cannot be calculated
b. 8.75%
c. 17.50%
d. 10.00%

Answer:

$$\text{IRR} = \frac{\text{Perpetuity Amount}}{\text{PV of perpetuity}} = \frac{8{,}750}{50{,}000} x\ 100 = 17.50\%$$

Example:

Find the IRR of a project with cash outflow of Rs.10,000 and inflow of Rs.21,436 eight year later?

a. 14.30%
b. 4.88%
c. 10.00%
d. 12.00%

Answer:

Future value = Present value x $(1 + r)^n$

$21,436 = 10,000 \times (1 + r)^8$

Solving the equation we get r = 10%; **Hence IRR = 10%**

9. Capital Budgeting Projects

- An investment decision can either lead to revenue enhancement (increase in revenues) or cost reduction. Both will ultimately improve the profits (cash flows)
- Revenue increase/cost reduction will have the same treatment while computing cash flows

Example:

The company presently incurs a cost of Rs.2 per tonne to dispose of 1,00,000 tonnes of waste. However, it has identified an alternative approach to process the waste, enabling it to sell the processed waste at Rs.20 per tonne. The processing cost is Rs.15 per tonne. How much is the annual cash flow to be considered in evaluation of project? Ignore tax

a. Rs.5,00,000
b. Rs.3,00,000
c. Rs.7,00,000
d. Rs.17,00,000

Answer:

Cash flow = 1,00,000 x (20 – 15) + cost saving of 2,00,000 (1,00,000 x 2) = **Rs.7,00,000**

10. Steps in computation of cash flows

Step 1: Initial outflow:

Particulars	Amount
Capital Expenditure	(XXX)
Working Capital	(XXX)
Initial outflow	**(XXX)**

Step 2: In-between inflows

Particulars	Amount
Revenues	XXX
Decrease in cost	XXX
Less: All cost other than depreciation	(XXX)
Profit before depreciation and tax	**XXX**
Less: Depreciation	XXX
Profit before tax	**XXX**
Less: Tax	(XXX)
Profit after tax	**XXX**
Add: Depreciation	XXX
Cash flow after tax	**XXX**
Less: Payment for original machine	(XXX)
Less: Purchase of additional machine	(XXX)
Less: Increase in working capital	(XXX)
Add: Decrease in working capital	XXX
Revised cash flow after tax	**XXX**

Step 3: Terminal inflow:

Particulars	Amount
Net salvage value	XXX
Recapture of working capital	XXX
Total Terminal inflow	**XXX**

Step 4: Consolidation of cash flows and computation of NPV:

Year	Cash flow	PVF @	DCF
0	Step 1		
1	Step 2		
2	Step 2		
3	Step 2		
4	Step 2		
5	Step 2 + Step 3		

Example:

ABC Limited is considering the replacement of its outdated machine with a new automatic machine, specifically Model A, which comes with a price tag of Rs.5 lakhs. The existing machine holds a salvage value of Rs.1 lakh. As part of the upgrade, all current utilities must be replaced with new ones incurring an additional cost of Rs.2 lakhs. However, the old utilities are expected to yield a salvage value of Rs.0.20 lakhs. How much is the initial outflow?

a. Rs.5,00,000
b. Rs.5,80,000
c. Rs.7,00,000
d. Rs.6,00,000

Answer:

- Initial outflow = Purchase price of new machine + Utilities purchased – Sale value of existing machine – sale value of utilities
- Initial outflow = 5,00,000 + 2,00,000 – 1,00,000 – 20,000 = **Rs.5,80,000**

Example:

The company acquired a machine with a total cost of Rs.10,00,000. Initially, 80% of the cost was paid upfront, and the remaining 20% was paid at the end of the first year. Additionally, there were installation costs amounting to Rs.2,00,000. The machine has a salvage value of Rs.1,00,000, and its expected lifespan is 5 years. How much is the year 0 outflow and annual depreciation if life is 5 years?

a. Rs.8,00,000 and Rs.2,20,000
b. Rs.10,00,000 and Rs.2,00,000
c. Rs.9,60,000 and Rs.2,20,000
d. Rs.10,00,000 and Rs.2,20,000

Answer:

Rs.10,00,000 and Rs.2,20,000

- Initial outflow = (10,00,000 x 80%) + 2,00,000 (installation cost) = Rs.10,00,000

$$\text{Annual depreciation} = \frac{10,00,000 + 2,00,000 - 1,00,000}{5} = \text{Rs. } 2,20,000$$

Example:

The machine's cost is Rs.5,00,000, with a salvage value of Rs.1,00,000 and a total lifespan of 5 years. The book value after 5 years is Rs.50,000. How much is the depreciation charged per annum under SLM?

a. Rs.1,00,000
b. Rs.90,000
c. Rs.80,000
d. Rs.70,000

Answer:

$$\text{Depreciation} = \frac{5,00,000 - 50,000}{5} = \text{Rs. } 90,000$$

Book value has been given in question and hence the total depreciation for 5 years is Rs.4,50,000 (5,00,000 – 50,000)

11. **Rules for computation of Cash flows**

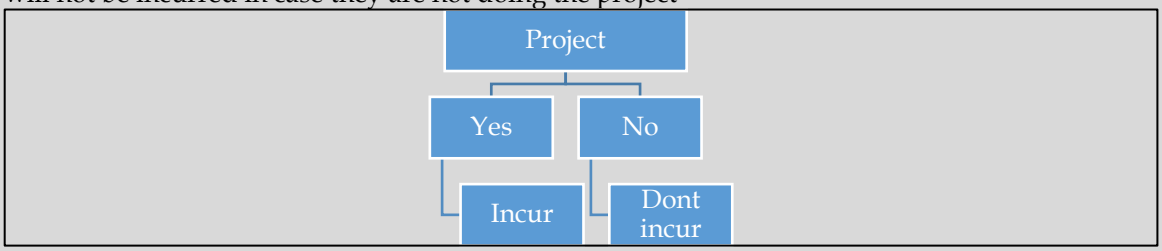
- **Depreciation:** Depreciation, while being a non-cash item, holds significance in cash flow analysis due to its impact on tax savings. **Since depreciation is tax-deductible, the tax benefits derived from it should be incorporated into cash flow calculations.**
- **Opportunity Cost:** Opportunity cost, representing the **value of the next best** alternative or the benefits foregone, must be factored into cash flow calculations. **Example:** Rent on owned buildings, Salary of Proprietor
  - Opportunity cost given is pre-tax - Deduct before PBT computation
  - Opportunity cost given is post-tax – Deduct after PAT computation

- **Sunk Cost:** Sunk costs, being historical and already incurred, should be ignored in cash flow computations. Example: Market survey expense, Feasibility study, Research and Development Cost
- **Overheads:**
  - Apportioned/General/Corporate overheads = Irrelevant
  - Specific/Incremental overheads = Relevant
- **Working Capital:** Changes in working capital have a direct impact on cash flows. An increase in working capital signifies an outflow, while a decrease denotes an inflow of cash
- **Reward Exclusion Principle:** Cash flows between the owner (Equity shareholder, Preference Shareholder, and debenture holder) and the company, such as interest, equity dividends, loans repaid, and loans taken, should be excluded from cash flow calculations.
- **Incremental Principle:** When conducting NPV analysis, focus solely on incremental cash flows, calculated as the cash flow post-project minus the cash flow before the project. This incremental approach ensures a more accurate assessment of the project's financial viability.

Simple rule for finding a relevant item:

Example 1:

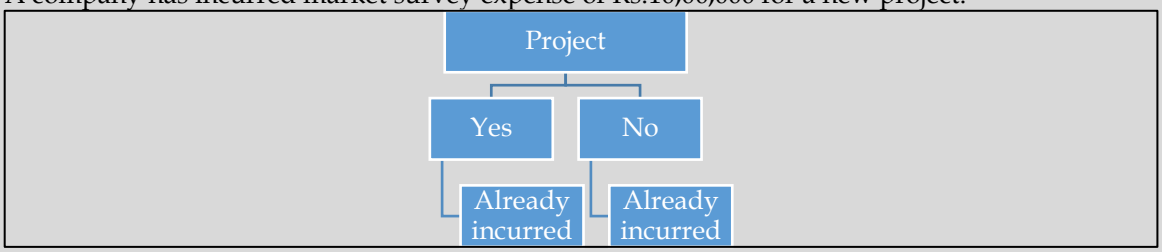
A company will incur marketing expenses of Rs.40,00,000 if they take up a new project. However, the same will not be incurred in case they are not doing the project



- In above example, it is a relevant item as the amount varies based on whether we do the project or not.

Example 2:

A company has incurred market survey expense of Rs.10,00,000 for a new project.



In above example, it is an irrelevant expense as the amount does not vary based on whether we do the project or not.

Example:

A new project has been apportioned factory overheads of Rs.100 lacs. Factory overheads include apportionment of general factory overheads except to the extent of insurance charges of Rs.90 lakh per annum payable on this venture. How much is the relevant factory overhead cost?

a. Rs.100 lacs
b. Rs.90 lacs
c. Rs.10 lacs
d. Rs.190 lacs

Answer:

Relevant Overhead cost = Rs.90 lacs which is specific to this project

Example:

The initial working capital invested in the project amounts to Rs.20,00,000. In the first year, it is anticipated to rise to Rs.25,00,000, and in the second year, it is expected to decrease to Rs.22,00,000. How much is the working capital adjustment in year 1 and 2?

a. Outflow of Rs.5,00,000 and Rs.2,00,000 in year 1 and 2 respectively
b. Outflow of Rs.5,00,000 in year 1 and inflow of Rs.3,00,000 in year 2
c. Inflow of Rs.5,00,000 and Rs.2,00,000 in year 1 and 2 respectively
d. Inflow of Rs.5,00,000 in year 1 and outflow of Rs.3,00,000 in year 2

Answer:

Outflow of Rs.5,00,000 in year 1 and inflow of Rs.3,00,000 in year 2

- Working capital has increased in year 1 and hence the same is an outflow of Rs.5,00,000 in year 1
- Working capital has decreased by Rs.3,00,000 in year 2 and hence the same is an inflow in year 2

Example:

The company has invested Rs.2,00,000 in conducting a market survey to assess the market response to its new product. In accordance with the survey findings, the company intends to spend Rs.10,00,000 towards machinery and Rs.4,00,000 towards working capital. How much is the initial outflow of the project?

a. Rs.14,00,000
b. Rs.16,00,000
c. Rs.12,00,000
d. Rs.10,00,000

Answer:

Rs.14,00,000

- Market survey expense is a sunk cost and hence irrelevant
- Total outflow = Rs.10,00,000 + Rs.4,00,000 = Rs.14,00,000

Example:

The hospital is contemplating the acquisition of a diagnostic machine, which is expected to generate an after-tax cash flow of Rs.80,000. Currently, the hospital is outsourcing the diagnostic work and earning commission income of Rs.20,000. The applicable tax rate for these financial considerations is 40%. How much is the incremental CFAT due to the new machine?

a. Rs.60,000
b. Rs.1,00,000
c. Rs.68,000
d. Rs.36,000

Answer:

Rs.68,000

- Incremental CFAT = 80,000 – Opportunity cost of Rs.12,000 = Rs.68,000
- Commission income is an opportunity cost and the post-tax commission income currently is Rs.12,000 (20,000 – 40%)

Example:

A project will incur labour cost of Rs.100 lacs in first year. This will include wage cost of 40 workers, whose transfer to this new project would reduce labour cost by Rs.40 lacs in first year. How much is the relevant labour cost in cash flow computation?

a. Rs.100 lacs
b. Rs.140 lacs
c. Rs.60 lacs
d. Rs.40 lacs

Answer:

Relevant labour cost = Rs.100 lacs – Rs.40 lacs = Rs.60 lacs

12. Computation of Net Salvage Value

- Net salvage value refers to the sale value of the machine adjusted for taxes.

Example:

Particulars	Situation 1	Situation 2	Situation 3
Sale Value	1,00,000	0	1,00,000
Less: Book value	-50,000	-1,50,000	-1,50,000
Capital gain/loss	**50,000**	**-1,50,000**	**-50,000**
Tax paid/saved @ 40%	-20,000	60,000	20,000
Net salvage value [SV + Tax saved – Tax paid]	80,000	60,000	1,20,000

Note:

- If Sale value is equal to book value, then there is no tax and hence **sale value is equal to net salvage value**
- If tax is to be ignored on capital gain, then **sale value = Net Salvage Valu**e
- If sale value is 0, it does not mean NSV is zero (Refer Example 2)
- If resale value is equal to cost of removal, then sale value is equal to zero.

Example:

An asset has accounting book value of Rs.1,00,000 and is fully depreciated for tax purpose. It can be sold today for Rs.2,00,000. How much is the net salvage value today if the tax rate is 40%?

a. Rs.2,00,000
b. Rs.1,20,000
c. Rs.1,60,000
d. Rs.2,40,000

Answer:

Rs.1,20,000

- Asset has been fully depreciated for tax purpose and hence capital gain is Rs.2,00,000 and tax paid on the same is Rs.80,000
- Net salvage value = 2,00,000 – 80,000 = **Rs.1,20,000**

Example:

The asset, originally valued at Rs.20,00,000, has a lifespan of 4 years with a depreciation rate of 20% on the Written Down Value (WDV) method. It is specified that there is no scrap value at the end of the 4-year period, and the tax rate is 50% How much is the net salvage value in year 4?

a. Nil
b. Rs.2,00,000
c. Rs.4,09,600
d. Rs.10,00,000

Answer:

Rs.4,09,600

Particulars	Amount
Sale value	0
Less: Book value	-8,19,200
Capital loss	8,19,200
Tax saved @ 50%	4,09,600
Net salvage value	4,09,600

Note 1: Computation of book value at end of year 4

Particulars	Year 1	Year 2	Year 3	Year 4
Opening WDV	20,00,000	16,00,000	12,80,000	10,24,000
Less: Depreciation @ 20%	-4,00,000	-3,20,000	-2,56,000	-2,04,800
Closing WDV	**16,00,000**	**12,80,000**	**10,24,000**	**8,19,200**

13. Treatment of losses

Situation	Treatment
Existing Profit-Making Company	• Claim immediate tax saving on losses • Tax saved will be an inflow in Step 2
Loss to be carried forward and set-off in subsequent years	• No tax saving in the year of loss • Future taxable profit will be reduced by carried forward loss and tax will be paid on lower PBT
Loss cannot be carried forward + Existing profit details not given	• No tax saving in the year of loss as well as in future years

Example:

Following is taken from income statement of a company:

Particulars	Year 1	Year 2	Year 3	Year 4
Profit before tax	-80,000	50,000	1,20,000	1,10,000

Tax rate = 30%. The loss of any year will be set-off from the profits of subsequent two years. How much is the Profit after tax of year 3?

a. 1,20,000
b. 84,000
c. 93,000
d. 63,000

Answer:

Rs.93,000

- PAT of year 3 = PBT – Tax paid of year 3

- PAT of year 3 = 1,20,000 – 27,000 = Rs.93,000

Note: Taxable income of year 3 is Rs.90,000 as there is carry forward loss of Rs.30,000 at end of year 2. Tax paid on Rs.90,000 is Rs.27,000 (90,000 x 30%)

Example:

An existing profit-making company is taking up a new project. It incurs loss of Rs.10,00,000 in year 1. How much is the tax adjustment in Year 1 if take rate is 30%?

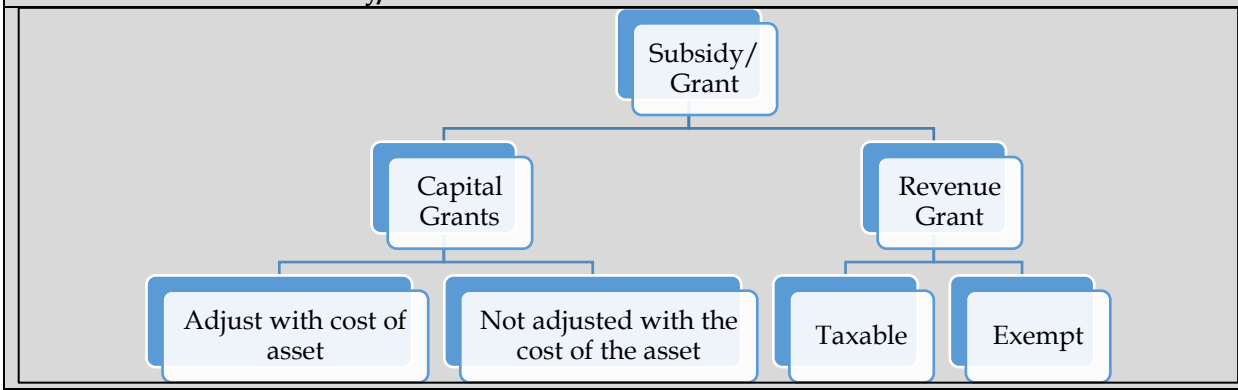
a. No tax payable or tax saved
b. Tax saving of Rs.3,00,000
c. Tax paid of Rs.3,00,000

Answer:

Tax saving of Rs.3,00,000

- Company is an existing profit-making company and hence will get immediate tax saving in year 1 due to loss.
- Tax saving in year 1 = 10,00,000 x 30% = Rs.3,00,000

14. Treatment of Subsidy/Government Grant



Note:

- Question will not clearly specify the treatement for capital grants and we will have to take an assumption and proceed. If the grant is adjusted with the cost of the asset, **then it will lead to lower depreciation expense**

15. Other points in computation of cash flows

- Net cash inflow after depreciation but before tax would mean Profit before Tax
- Cash flow before tax would mean Profit before depreciation and tax
- **Payment of expenses in advance:** For income tax computation we have to follow accrual principle and compute tax. However, expenses are paid in advance and will need cash flow adjustment. We should reverse (add-back) expense considered in tax computation and deduct expense actually paid
- **Projects with only outflows:** We should compute cash flows in normal manner. Total of step 4 DCF would be called as PV of outflows. We should select an alternative having lower PV of outflow

Example:

A company purchases an additional machine of Rs.30,00,000 at start of year 3. How would this be considered in cash flow computation?

a. Outflow in year 3
b. Inflow in year 3
c. Outflow in year 2
d. Inflow in year 2

Answer:

Outflow in year 2

- Beginning of year 3 = End of year 2. Hence the same is an outflow at end of year 2

16. NPV vs IRR Conflict

- Conflict arises if NPV prefers Project 1 whereas IRR prefers Project 2. We need to check if there is a life disparity (unequal lives)
- If there is no life disparity, select project as per maximum NPV

- In case of life disparity, we should compute Equated Annual Benefit and select the project having higher Equated Annual Benefit (EAB)

$$\text{EAB} = \frac{\text{NPV}}{\text{PVAF (r, life)}}$$

Reason for conflict:

- NPV assumes that cash flows are re-invested at cost of capital whereas IRR assumes that cash flows are re-invested at IRR

Example:

NPV assumed that intermediate cash flows are reinvested at _____ whereas IRR assumes that cash inflows are re-invested at _____

a. Cost of capital and Cost of capital
b. Cost of capital and IRR
c. IRR and IRR
d. IRR and cost of capital

Answer:

Cost of capital and IRR

Example:

NPV of Project A = Rs.1,00,000 (3 year life); NPV of Project B = Rs.80,000 (2 year life). Which project is to be selected if cost of capital is 10%?

a. Project A
b. Project B
c. Neither Project A nor Project B
d. Indifferent between Project A and Project B

Answer:

We can select Project B as it has better equated annual benefit

$$\text{EAB} = \frac{\text{NPV}}{\text{PVAF (r, life)}}$$

$$\text{EAB of Project A} = \frac{1{,}00{,}000}{2.487} = \text{Rs. } 40{,}209$$

$$\text{EAB of Project B} = \frac{80{,}000}{1.736} = \text{Rs. } 46{,}083$$

17. Life Disparity and Replacement Chain Method

- Life disparity can also be solved using replacement chain method. In this case we need to do repeated investments so that life of two projects become same.
- **Example:** Project A has life of 2 years and Project B has life of 6 years. Repeating Project A three times will make the life of both projects as 6 years
- Compute NPV with same life and select project having higher NPV

18. Equated Annual Cost

- For projects with only outflows decision is done on the basis of PV of outflows
- Life disparity may also exist and in that case decision should be on the basis of EAC

$$\text{EAC} = \frac{\text{PV of Outflow}}{\text{PVAF (r, life)}}$$

19. Abandonment Decision

- Abandonment would mean giving up an existing asset
- We need to compare cash flow of selling the asset with the cash flow of continuing the asset and decide on abandonment

Cash flow of Abandonment Decision:

Step 1: Initial outflow:

Particulars	Amount
NSV of existing asset on day 0 [Opportunity cost]	(XXX)
Working Capital	(XXX)
Initial outflow	**(XXX)**

Step 2: In-between inflows – No change

Step 3: Terminal inflow – No Change

Step 4: No change

Decision:

- Continue with the asset if we get Positive NPV. Discard the asset if we get Negative NPV

Example:

A company is re-evaluating the decision to continue with an existing machine. The machine was purchased for Rs.20,00,000 three years ago and is being depreciated based on an economic life of 8 years. The company is following SLM method of depreciation. The machine can be sold today for Rs.10,00,000. The tax rate on business profits and capital gains is 25% and 20%. How much is the opportunity outflow related to old machine today?

a. Rs.10,00,000
b. Rs.9,50,000
c. Rs.10,50,000
d. Rs.10,62,500

Answer:

Opportunity outflow is equal to net salvage value of the machine today.

Particulars	Amount
Sale Value	10,00,000
Less: Book value [20,00,000 – 3 x 2,50,0000]	-12,50,000
Capital loss	2,50,000
Tax saved @ 20%	50,000
Net salvage value [SV + Tax Saved]	10,50,000

20. Replacement Decision

- Replacement would mean giving up an existing asset and buying a new asset in place of that
- Replacement Decision = Abandonment decision + New Purchase Decision

Approaches to solve Replacement Decision Questions:

- Approach 1 – Separate NPV Analysis of old machine and new machine – Non-incremental approach – Can be followed if multiple new machines are there/balance life of old and new machine is not same
- Approach 2 – Incremental cash flow approach – Compute incremental cash flows of every step by comparing existing and new machine cash flow – Incremental cash flow = Cash flow of new machine – Cash flow of old machine

Example:

A company is considering replacement of an existing machine with a new machine. How much would be the initial outflow from following information?

Purchase price of the new machine	Rs.8,000
Shipping and Installation charge	Rs.2,000
Sale price of old machine	Rs.6,000
Book value of old machine	Rs.2,000
Inventory increases if installed	Rs.3,000
Accounts payable increase if installed	Rs.1,000
Tax rate on capital gains	25%

a. Rs.7,000
b. Rs.10,000
c. Rs.3,000
d. Rs.5,000

Answer:

Initial outlay = Purchase cost of new machine (Rs.10,000) + WC increase (Rs.2,000) – Net salvage value of old machine (6,000 – 1,000) = Rs.7,000

Example:

The company is considering the installation of a new machine that would result in material cost savings of Rs.2,00,000 and labor cost savings of Rs.4,00,000. Additionally, there will be maintenance costs associated with the machine amounting to Rs.3,00,000. The machine itself, with a lifespan of 5 years, has a cost of Rs.10,00,000. How much is the annual CFAT if tax rate is 30%?

a. Rs.3,00,000
b. Rs.3,30,000
c. Rs.2,70,000
d. Rs.2,00,000

Answer:

Particulars	Amount
Saving in cost	6,00,000
Less: Maintenance cost	-3,00,000
PBDT	**3,00,000**
Less: Depreciation	-2,00,000
PBT	**1,00,000**
Less: Tax @ 30%	-30,000
PAT	**70,000**
Add: Depreciation	2,00,000
CFAT	**2,70,000**

21. Block of Assets Method

- Capital loss will not arise unless all assets of the block are sold. In case we replace an old machine with new machine, block will continue and hence STCL cannot arise
- Capital gain can arise if the value of block becomes negative. (Rarest scenario)
- Depreciation can be charged on the block value and not purchase price of the new asset. Block value = Existing block value – sale value of old asset + Purchase price of new asset

Example:

A company follows block of assets method of depreciation and it has several other machines in the block. The company is selling an existing machine with book value of Rs.3,00,000 for Rs.5,00,000. It will purchase a new machine for Rs.10,00,000. Depreciation rate is 10% and tax rate is 40%. How much is the tax paid on sale and incremental depreciation in year 1?

a. Rs.80,000 (tax paid) and depreciation of Rs.70,000
b. Nil tax paid and depreciation of Rs.70,000
c. Rs.80,000 (tax paid) and depreciation of Rs.50,000
d. Nil tax paid and depreciation of Rs.50,000

Answer:

Nil tax paid and depreciation of Rs.50,000

- Company will not pay tax as there are other assets in the block
- Incremental WDV of the block = 10,00,000 – 5,00,000 = Rs.5,00,000
- Incremental depreciation = 5,00,000 x 10% = Rs.50,000

22. Capital Rationing

- Capital rationing refers to a situation where the demand for money is more than its supply
- Demand for money = Investment of acceptable projects

Steps:

- **Step 1:** Identify capital rationing exist
- **Step 2:** Rank the various projects in the order of Profitability index
- **Step 3:**
  - **Divisible projects:** Allocate the money in the order of ranking
- **Indivisible projects:** Follow a combination approach and arrive at various combination. Select the combination with maximum aggregate NPV

23. Modified IRR

- NPV assumes that cash flows are re-invested at cost of capital whereas IRR assumes that cash flows are re-invested at IRR

- Re-investment at IRR is not a realistic assumption and hence modified IRR is the IRR assuming **intermediate cash flows getting re-invested at cost of capital**

Example:

Initial Outlay of Project = Rs.50,000, Cost of capital = 12.00%; Life of the project = 4 years. Aggregate future value of cash inflows = Rs.1,04,896.0. How much is the MIRR of the proposal?

a. 20.35%
b. 21.53%
c. 31.25%
d. 12.25%

Answer:

$\text{FV (inflow)} = \text{PV (outlflow)} \text{x } (1 + \text{r})^{n}$

$1{,}04{,}896.50 = 50{,}000 \text{ x } (1 + \text{r})^{4}$

$2.09793 = (1 + \text{r})^{4}; (1 + \text{r}) = 1.2035; \textbf{Hence MIRR} = \mathbf{20.35}\%$

Chapter 8 – Dividend Decisions

1. Introduction

- Dividend is the reward paid to equity shareholders at the end of the year/during the year for their capital contribution to the company
- Dividend decision is basically splitting the earnings of the company into dividends (payout) and retained earnings (retention)
- In this chapter we will learn about multiple models on dividend payments and the likely impact of the same on equity valuation

2. Walter's Model

Under this approach dividend depends on the following items:

- Return on equity (R) = Rate of return which the company can earn on retained earnings
- Cost of equity (Ke) = Rate of return which a shareholder wants from the company

Optimum Payout Ratio:

R > Ke	Growing	0%
R = Ke	Normal	Indifferent
R < Ke	Decline	100%

Impact of Dividend on Valuation:

$$P_o = \frac{D}{K_e} + \frac{\left(\frac{r}{K_e}\right) x\,(E - D)}{K_e}$$

Note:

- D = Dividend per share
- E = Earnings per share

Example:

What should be the optimum Dividend pay-out ratio, when r = 15% & K = 12%:

a) 100%
b) 50%
c) Zero
d) None of the above

Answer:

Zero as return on equity is higher than cost of capital

Example:

Company earns EPS of Rs.20 per share. ROI is 10% and cost of equity is 15%. How much is the fair price of share under Walter's model if the company has payout ratio of 40%?

a. Rs.133.33
b. Rs.106.67
c. Rs.100.00
d. Rs.200.00

Answer:

$$\text{Price} = \frac{D}{K_e} + \frac{\frac{r}{K_e} x\,(E - D)}{K_e} = \frac{8}{0.15} + \frac{\left(\frac{0.10}{0.15} x\,(20 - 8)\right)}{0.15} = 53.33 + 53.34 = \text{Rs. } 106.67 \text{ per share}$$

Example:

PE Multiple = 8 Times; Value of equity = Rs.20,00,000; PAT = Rs.2,00,000. How much is the optimum payout ratio?

a. 100%
b. 0%
c. Indifferent

Answer:

$$\text{Cost of equity} = \frac{1}{\text{PE Multiple}} = \frac{1}{8} = 12.50\%$$

$$\text{Return on equity} = \frac{\text{EAES}}{\text{Amount of equity}} = \frac{2,00,000}{20,00,000}\ x\ 100 = 10\%$$

Optimum payout ratio is 100% as cost of equity is higher than return on equity

Example:

ROI = 20%; Cost of capital = 16%; EPS = Rs.6 per share; What should be the payout ratio to have price of Rs.42 as per Walter's model?

a. 100%
b. 50%
c. 60%
d. 52%

Answer:

$$42 = \frac{D}{0.16} + \frac{\frac{0.20}{0.16} x\ (6 - D)}{0.16}; 42 = \frac{D + 1.25(6 - D)}{0.16}$$

$$42 \text{ x } 0.16 = D + 7.50 - 1.25D; 6.72 = -0.25D + 7.50; 0.25D = 0.78; D = \frac{0.78}{0.25} = 3.12 \text{ per share}$$

$$\text{Dividend Payout Ratio} = \frac{DPS}{EPS} x\ 100 = \frac{3.12}{6} x\ 100 = \mathbf{52}\%$$

3. Gordon's Model

- Gordon's model assumes that an equity share has characteristic of growing perpetuity

$$P_o = \frac{D_1}{K_e - G}$$

Note:

- D1 = Dividend of next year = Dividend of current year + Growth rate
- Ke = Cost of equity
- G = Growth rate = ROE x Retention Ratio

Example:

If a firm declared 25% dividend on share of face value of Rs 10 its growth rate is 5% & its rate of capitalization is 12% its expected price would be Rs...

a) 31.2
b) 33.50
c) 36
d) 37.50

Answer:

$$P_o = \frac{D_1}{K_e - G} = \frac{2.5 + 5\%}{12\% - 5\%} = \text{Rs. } 37.50$$

Example:

The cost of capital of a firm is 12% & its expected earning per share at the end of the year is Rs 20. its existing payout ratio is 25%. the company is planning to increase its payout ratio to 50% what will be the effect of this change on the market price of equity share (MPS) of the company as per Gordon model , If the reinvestment rate of the company is 15%

d. It will increase by Rs 444.45
e. It will decrease by Rs 444.45
f. It will increase by Rs 222.22
g. It will decrease by Rs 222.22

Answer:

It will decrease by Rs.444.45

$$\text{Earlier price} = \frac{20 \text{ x } 25\%}{12\% - 11.25\%} = Rs. 666.67$$

$$\text{New price} = \frac{20 \text{ x } 50\%}{12\% - 7.50\%} = Rs. 222.22$$

Price will decrease by Rs.444.45 (666.67 – 222.22)

Example:

A company's share is currently price at Rs.100 and has long-term growth rate of 12%. Dividend paid is Rs.4 per share. It has ROE of 16 percent and is changing the dividend payout to 60%. How much is the new Dividend per share?

a. Rs.6.40
b. Rs.9.60
c. Rs.8.00
d. Rs.4.00

Answer:

Existing position:

Growth rate = ROE x Retention ratio

12% = 16% x Retention ratio

Retention ratio = 75%

Revised Position:

- Company has paid DPS of Rs.4 per share and the same would be 25 percent of EPS
- EPS = 4/25% = Rs.16.00 per share
- **New DPS = 16.00 x 60% = Rs.9.60 per share.**

Example:

Determine the market price of share of XYZ ltd as per gordon's model, given equity capitalization rate =11% expected earning =Rs. 20 rate of return on investment =10% & retention ratio =30%

a) 165
b) 175
c) 185
d) 195

Answer:

Rs.175

$$\text{Price} = \frac{14}{11\% - 3\%} = \text{Rs. } 175.00$$

4. **Link between EPS, BVPS and ROE**

$$\text{ROE} = \frac{\text{EPS}}{\text{Book value per share}}$$

Example:

A company has ROE of 12% and Book value per share of Rs.200. How much is the EPS?

a. Rs.24
b. Rs.12
c. Rs.1,666.67
d. Rs.100

Answer:

EPS = ROE x Book value per share = 12% x 200 = **Rs.24.00 per share**

5. **Gordon's Model – Step-up Growth**

- A company may grow at different rates before the stabilization happens. Gordon formula of valuation cannot be used when we have different growth rates. Hence we will have to wait till growth stabilizes

Steps in valuation:

- **Step 1:** Compute Dividends till the first year of stabilization
- **Step 2:** Compute MPS at beginning of stabilization phase using Gordon formula
- **Step 3:** Discount the above values and get today's share price

Example:

A company has reported EPS of Rs.15 in last year. EPS will grow at 15% for two years and then stabilize at 10% growth. Payout ratio is 40%. How much is the fair price at end of year 2 if cost of equity is 15%?

a. Rs.75.00
b. Rs.174.57
c. Rs.200.00
d. Rs.436.43

Answer:

$$P_2 = \frac{D_3}{K_e - G} = \frac{8.7285}{0.15 - 0.10} = \mathbf{Rs.\,174.57}$$

Note:

- Last year dividend = 15 x 40% = Rs.6.00
- Dividend of year 1 = 6 + 15% = Rs.6.90
- Dividend of year 2 = 6.90 + 15% = Rs.7.935
- Dividend of year 3 = 7.935 + 10% = Rs.8.7285

6. Cum-dividend and Ex-dividend price

- Cum-dividend price refers to the price of the shares bought inclusive of dividends
- Ex-dividend price refers to the price of the shares without the dividend
- Theoretically share price will fall by the amount of dividend once the share goes ex-dividend

Example:

Mr H is currently holding 1,00,000 shares of HM ltd, and currently the share of HM ltd is trading on Bombay Stock Exchange at Rs. 50 per share. Mr A have a policy to re-invest the amount of any dividend received into the shared back again of HM ltd. If HM ltd has declared a dividend of Rs. 10 per share, please determine the no of shares that Mr A will get by re-investing the dividends

a. 20,000 shares
b. 25,000 shares
c. 50,000 shares
d. 10,000 shares

Answer:

- Dividend received = 1,00,000 x 10 = Rs.10,00,000
- Ex-Dividend price = 50 – 10 = Rs.40
- No of shares allotted = (10,00,000/40) = **25,000 shares**

7. Graham & Dodd Model or Traditional Approach

$$\text{Price} = \left[\text{Dividend} + \left(\frac{\text{Earning}}{3}\right)\right] \text{x Multiplier}$$

Example:

Compute EPS according to Graham & Dodd approach from the given information:

Market price	Rs.56
Dividend pay-out ratio	60%
Multiplier	2

a) Rs 30
b) Rs 56
c) Rs 28
d) Rs 84

Answer:

$$\text{Price under G\&D Model} = \left(0.6\text{E} + \frac{\text{E}}{3}\right) \text{x } 2$$

$$56 = \left(0.6\text{E} + \frac{\text{E}}{3}\right) \text{x } 2; \text{E} = \frac{28}{0.9333} = 30 \text{ per share}$$

8. Lintner's Model

- This approach can be used to determine the amount of dividend payable. Companies should avoid significant increase in dividends during bumper years so that they can avoid decline in dividends

Steps:

- **Step 1:** Identify last year DPS [Rs.10]
- **Step 2:** Identify target DPS of current year based on EPS and Optimum payout ratio [15 = 30 x 50%]
- **Step 3:** Compute tentative increase in DPS [5 = 15 – 10]
- **Step 4:** Compute actual increase in DPS = Step 3 figure x Adjustment factor [1.5 = 5 x 30%]
- **Step 5:** Compute actual DPS of current year = Step 1 figure + Step 4 figure [11.50 = 10 + 1.50]

Example:

Dividend of last year = Rs.10.00; Speed of adjustment = 40%; Target payout ratio = 80% and EPS of current year = Rs.15.00. How much should be the EPS of coming year?

a. Rs.12.00
b. Rs.11.20
c. Rs.10.80
d. Rs.10.00

Answer:

Particulars	Amount

Dividend per share of last year	10.00
Target DPS of current year (15 x 80%)	12.00
Target increase in DPS	2.00
Actual increase in DPS (2.00 x 40%)	0.80
Final DPS of current year (10.00 + 0.80)	**10.80**

9. MM Approach

- MM Approach is a dividend irrelevance model and hence value of firm does not get impacted by Dividend Decision

Steps:

Step 1: Calculate Price at end of the year $P_1 = P_0 x\,(1 + K_e) - D_1$
Step 2: Compute retained earnings • Retained earnings = Total earnings – Dividends Paid
Step 3: Compute amount to be raised as external equity • Amount to be raised = Investment to be done – Retained earnings
Step 4: Compute number of shares to be issued = (Step 3/Step 1)
Step 5: Compute closing value of firm = (Closing shares x Closing Price)

Example:

ABC Limited has planned investment of Rs.5,00,000 in next year. It will earn profits of Rs.3,00,000 and declare dividend of Rs.4 per share on 25,000 shares. Current share price is Rs.100 per share and cost of equity is 10%. How many new shares would be issued for meeting the planned investment?

a. 5,000 shares
b. 3,000 shares
c. 2,830 shares
d. 4,717 shares

Answer:

- Price at end of year = (100 + 10%) – 4 = Rs.106 per share
- Retained earnings = 3,00,000 – (25,000 x 4) = Rs.2,00,000
- New equity to be issued = 5,00,000 – 2,00,000 = Rs.3,00,000

Number of shares $= \frac{3,00,000}{106} = \mathbf{2,830\ shares}$

Example:

The current price of the share is Rs.100. Cost of equity is 12% and Dividend per share by year-end is Rs.6. How much is the price of the share by end of the year?

a. Rs.112
b. Rs.106
c. Rs.100

Answer:

$P_1 = P_0 x\,(1 + K_e) - D_1$

$P_1 = 100 x\,(1 + 12\%) - 6 = \mathbf{Rs.\,106\ per\ share}$

10. **Impact of Buyback on Book Value Per Share**

Buyback will have an impact on book value per share as the overall Networth will decline with decline in number of shares. Any buyback done at a price different from the book value per share will change the book value per share.

Revised Book value per share $= \frac{\text{Existing Networth} - \text{Buyback Size}}{\text{Exisitng shares} - \text{Shares bought back}}$

Example:

The company has 10,000 shares having book value of Rs.200 each. The company plans to buy-back 2,000 shares at value of Rs.250 each. How much is the book value per share post buyback?

a. Rs.200
b. Rs.50
c. Rs.250
d. Rs.187.50

Answer:

New book value per share $= \frac{(10{,}000 \text{ x } 200) - (2{,}000 \text{ x } 250)}{10{,}000 - 2{,}000} =$ **Rs. 187. 50 per share**

Chapter 9 – Management of Working Capital

1. Introduction

- Working capital is the money required for daily operations of a company. It is basically the excess of current assets over current liabilities of a company
- Working Capital = Current Assets – Current Liabilities
- In this chapter we would learn about estimation of required working capital, management of components of working capital and financing of working capital

2. Estimation of working capital through operating cycle method

- Operating Cycle (cash to cash cycle) refers to the time taken to convert cash back into cash. Working capital requirements are directly proportional to the operating cycle
- Operating Cycle = RM Days + WIP Day + FG Days + Debtor Days – Creditor Days

$$\text{RM Days} = \frac{\text{Average RM}}{\text{RM Consumed}} \text{ x } 365$$

$$\text{WIP Days} = \frac{\text{Average WIP}}{\text{Cost of Production}} \text{ x } 365$$

$$\text{FG Days} = \frac{\text{Average FG}}{\text{Cost of Goods Sold}} \text{ x } 365$$

$$\text{Debtor Days} = \frac{\text{Average Debtors}}{\text{Credit Sales}} \text{ x } 365$$

$$\text{Creditor Days} = \frac{\text{Average Creditors}}{\text{Credit Purchases}} \text{ x } 365$$

$$\text{Working Capital Requirement} = \text{Annual Operating Cost x} \frac{\text{Operating Cycle in days}}{365}$$

$$\text{Number of operating cycles in a year} = \frac{365}{\text{Operating Cycle in days}}$$

Example:

Total Operating Cost = Rs.200 lacs; Sales = Rs.250 lacs; Number of operating cycles in a year = 5; How much is the amount of working capital requirement?

a. 1,000 lacs
b. 40 lacs
c. 1,250 lacs
d. 50 lacs

Answer:

$$\text{Working capital requirement} = \frac{\text{Annual operating cost}}{\text{Number of operating cycles}} = \frac{200\ lacs}{5} = 40 \text{ lacs}$$

Example:

Value of WIP = Rs.10,00,000; Cost of Production = Rs.4,00,00,000; Cost of Goods sold = Rs.4,20,00,000; Prime Cost = Rs.2,00,00,000. How much is the WIP days if one year consist of 360 days?

a. 18 days
b. 9 days
c. 8.57 days

Answer:

$$\text{WIP days} = \frac{\text{Value of WIP}}{\text{Cost of Production}} x\ 100 = \frac{10,00,000}{4,00,00,000} x\ 360 = \mathbf{9\ days}$$

Example:

Raw material storage period	45 days
Work-in-progress conversion period	20 days
Finished goods storage period	25 days
Debt collection period	30 days
Creditors payment period	60 days
Annual operating cost (including depreciation of Rs.2,50,000)	Rs.25,00,000
One year consist of 360 days	

How much is the working capital requirement under cash cost approach?

a. 4,16,667
b. 3,75,000

c. 8,33,333
d. 7,50,000

Answer:

- Operating cycle = RM days + WIP days + FG days + Debtor days – Creditor days
- Operating cycle = 45 + 20 + 25 + 30 – 60 = 60 days
- Amount of WC requirement under cash cost approach = 22,50,000 x (60/360) = Rs.3,75,000

Example:

Particulars	Balance as on April 1, 2009	Balance as on March 31, 2010
Finished goods	60,181	70,175
Annual cost of production		7,50,000

How much is the FG days?

a. 32.15 days
b. 31.72 days
c. 34.15 days
d. 34.61 days

Answer:

Particulars	Calculation	Amount
FG Days	$\frac{\text{Average FG}}{\text{Cost of Goods Sold}} \text{ x } 365$ $= \frac{\frac{60,181 + 70,175}{2}}{7,50,000 + 60,181 - 70,175} \text{ x } 365$	32.15 days

3. Working capital estimation through individual estimation of components of CA and CL

- Under this method, each item of working capital is forecasted based on the information given in question

Item	Forecast Basis
Stock of RM	RM consumed
Stock of WIP	Cost of Production
Stock of FG	Cost of Goods Sold
Debtors	Credit Sales
Creditors	Credit Purchases

- Working capital requirement = Current assets (Forecasted individually) – Current Liabilities (Forecasted individually)

Example:

The company believes in keeping Rs.2,50,000 available to it including the overdraft limit of Rs.75,000 not yet utilized by the company. How much is the cash and Overdraft in WC estimation?

a. Cash of Rs.2,50,000 and Overdraft of Rs.75,000
b. Cash of Rs.2,50,000 and overdraft of Rs.0
c. Cash of Rs.1,75,000 and Overdraft of Rs.75,000
d. Cash of Rs.1,75,000 and overdraft of Rs.0

Answer:

Cash of Rs.1,75,000 and overdraft of Rs.0

Example:

Sales = Rs.84,00,000; Material consumed = 60 percent of sales; The company maintains stock of raw material equal to economic order quantity. The company incurs Rs.100 as per ordering cost per order and opportunity cost of capital is 15% p.a. How much is the inventory in estimation of working capital?

a. Rs.81,975
b. Rs.40,988
c. Rs.1,63,950
d. Rs.2,00,000

Answer:

$$\text{Inventory} = \text{EOQ} = \sqrt{\frac{2 \text{ x } 50,40,000 \text{ x } 100}{0.15}} = Rs.81,975$$

4. Cost Sheet Format for an existing company

Particulars	Calculation	Total Approach	Cash Cost Approach
RM Purchased/consumed	Units Produced x RM cost per unit	XXX	XXX
Direct wages	Units produced x Wage cost	XXX	XXX
Overheads other than depreciation	Units produced x cost per unit	XXX	XXX
Depreciation		XXX	NA
GWC/NWC/COP/COGS		**XXX**	**XXX**
Admin expenses		XXX	XXX
Selling expenses		XXX	XXX
Cost of Sales		**XXX**	**XXX**
Profit		XXX	NA
Sales		**XXX**	**NA**

Example:

Particulars	Amount
Sales (at two months credit)	36,00,000
Material consumed (suppliers extend two months credit)	9,00,000
Wages paid (monthly in arrears)	7,20,000
Manufacturing expenses outstanding at end of the year (cash expenses are paid one month in arrears)	80,000

The company sells its products on gross profit of 25% counting depreciation as part of the cost of production. How much is the depreciation?

a. Cannot be calculated
b. Rs.10,00,000
c. Rs.1,20,000
d. Rs.2,40,000

Answer:

Particulars	Calculation	Amount
Direct material		9,00,000
Direct wages		7,20,000
Manufacturing expenses	80,000 x 12	9,60,000
Depreciation	**(b/f)**	**1,20,000**
GWC/NWC/COP/COGS	36,00,000 x 75%	27,00,000

Example:

Cash sales are 50 percent of credit sales. The company sold 2,00,000 units at Rs.300 per unit. How much is the debtors if the credit allowed is 2 months?

a. Rs.1,00,00,000
b. Rs.66,66,667
c. Rs.33,33,333
d. Rs.50,00,000

Answer:

- Cash sales + Credit Sales = Total Sales
- 0.5 Credit sales + Credit sales = 6,00,00,000
- Credit sales = 4,00,00,000
- Debtors = 4,00,00,000 x (2/12) = Rs.66,66,667

Example:

Particulars	Amount
Sales – Domestic at one-month credit	24,00,000
Sales - Exports at three months credit (sales price 10% below domestic price)	10,80,000

Rate of gross profit is 20%. How much is the Cost of Goods Sold?

a. Rs.27,84,000
b. Rs.27,00,000
c. Rs.28,80,000
d. Rs.30,00,000

Answer:

Particulars	Domestic	Export
Actual Sales	24,00,000	10,80,000
Adjusted sales (adjusted for discount)	24,00,000	12,00,000 (10,80,000x 100/90)
COGS @ 80% of adjusted sales	**19,20,000**	**9,60,000**

- Total COGS = 19,20,000 + 9,60,000 = Rs.28,80,000

5. Cost Sheet Format for a new company/new project

Particulars	Calculation	Total Approach	Cash Cost Approach
Opening RM		0	0
Add: Purchases		XXX	XXX
Less: Closing RM		(XXX)	(XXX)
RM consumed		XXX	XXX
Direct wages		XXX	XXX
Overheads other than depreciation		XXX	XXX
Depreciation		XXX	NA
GWC		**XXX**	**XXX**
Add: Opening WIP		0	0
Less: Closing WIP		(XXX)	(XXX)
NWC/COP		**XXX**	**XXX**
Add: Opening FG		0	0
Less: Closing FG		(XXX)	(XXX)
Cost of Goods Sold		**XXX**	**XXX**
Admin expenses		XXX	XXX
Selling expenses		XXX	XXX
Cost of Sales		**XXX**	**XXX**
Profit		XXX	NA
Sales		**XXX**	**NA**

Example:

Cost of goods sold has been derived as follows:

Particulars	Amount
Material used	8,40,000
Wages and manufacturing expenses	6,25,000
Depreciation	2,35,000
	17,00,000
Less: Stock of finished goods (10%)	1,70,000
	15,30,000

The figures given above relate only to the goods that have been finished and not to work in progress; goods equal to 15% of the year's production (in terms of physical units) are in progress on an average, requiring full materials but only 40% of other expenses. How much is the closing WIP?

Answer:

Particulars	Calculation	Amount
Opening Raw material		0
Add: Purchases (b/f)		11,27,000
Less: Closing Raw material	$9,66,000 \times \left(\frac{2}{12}\right)$	-1,61,000
Raw material consumed	$\left(\frac{8,40,000}{100}\right) x\ 115$	**9,66,000**
Wages and manufacturing expenses	$\left(\frac{6,25,000}{100}\right) \times 106$	6,62,500
Depreciation	$\left(\frac{2,35,000}{100}\right) \times 106$	2,49,100
Gross works cost		**18,77,600**
Add: Opening WIP		0
Less: Closing WIP		-1,77,600

Net works cost/Cost of production		**17,00,000**

Closing WIP:

Particulars	Equivalent units	Value
Materials	15	1,26,000 (8,400 x 15)
Wages and manufacturing expenses	6	37,500 (6,250 x 6)
Depreciation	6	14,100 [2,350 x 6]
Total		**1,77,600**

Example:

A company is starting a new project and the following is the expectation on sales and production

Year	Production units	Sales units
1	15,000	14,000
2	20,000	18,000

At full capacity of 24,000 units, the cost per unit will be as follows:

Direct material	80
Labour and variable expenses	40
Fixed manufacturing and administrative expenses	20
Depreciation	10
Total cost	**150**

How much is the value of closing stock of year 2 under average cost method?

a. Rs.4,69,714
b. Rs.3,13,143
c. Rs.1,68,000
d. Rs.4,50,000

Answer:

Particulars	Year 1	Year 2
RM Consumed		
Opening Raw material	-	3,00,000
Add: Purchases (b/f)	15,00,000	17,00,000
Less: Closing Raw material (RM consumed x 3/12)	-3,00,000	-4,00,000
RM Consumed (units produced x 80)	**12,00,000**	**16,00,000**
Labour and variable expenses (units produced x 40)	6,00,000	8,00,000
Fixed Manufacturing and admin expenses (24,000 units x 20)	4,80,000	4,80,000
Depreciation (24,000 units x 10)	2,40,000	2,40,000
GWC/NWC/COP	**25,20,000**	**31,20,000**
Add: Opening FG	-	1,68,000
Less: Closing FG	-1,68,000	-4,69,714
Cost of Goods sold	**23,52,000**	**28,18,286**

Note:

Note 1: Closing FG of year 1:

$$\text{Closing FG} = \frac{25,20,000}{15,000} \text{x } 1,000 = \text{Rs. } 1,68,000$$

Note 2: Closing FG of year 2:

$$\text{Closing FG} = \frac{(31,20,000 + 1,68,000)}{(20,000 + 1,000)} \text{x } 3,000 = \text{Rs. } 4,69,714$$

Example:

Aneja Limited, a newly formed company, has applied to the commercial bank for the first time for financing its working capital requirements. Estimated level of activity: 1,04,000 completed units of production plus 4,000 units of work-in- progress. Overheads cost is Rs.60 per unit. How much is outstanding overheads if lag in payment of overheads is one month?

a. Rs.10,40,000

b. Rs.10,60,000
c. Rs.10,80,000
d. Rs.12,00,000

Answer:

- Overheads expenditure = 60 x (1,04,000 + (4,000 x 50%)) = Rs.63,60,000
- Outstanding overheads = 63,60,000 x (2/12) = Rs.10,60,000

6. Total Approach vs Cash Cost Approach

- Total Approach considers all items of cost (whether cash/non-cash) for estimation of inventory. Additionally, credit sales is used for estimation of debtors
- Cash cost approach ignores non-cash items such as depreciation for estimation of inventory. Additionally, cash cost of credit sales is used for estimation of debtors (ignore profit)

7. Estimation of WIP

- Stock of WIP is estimated on the basis of cost of production and the production period

$$\text{Stock of WIP} = \text{Cost of Production x}\frac{\text{PP}}{365}$$

- On the balance sheet, the degree of completion for material and other items (conversion cost (or) wages and overheads) will not be 100%. Hence, we shouldn't take the entire COP for estimation of WIP

$$\text{Stock of WIP} = (\text{Direct material x DOC\%} + \text{Other costs x DOC\%}) \text{ x}\frac{\text{PP}}{365}$$

- If problem is silent, DOC for material is 100% and for others it is 50%

Example:

Production during the previous year was 1,20,000 units; it is planned that level of activity will increase by 25 percent during the current year. The expected ratios of cost to selling price are: raw materials 60%, direct wages 10% overheads 20%. Each unit of production is expected to be in process for one month. Selling price is Rs.10 per unit. How much is the closing WIP?

a. Rs.90,000
b. Rs.1,12,500
c. Rs.75,000
d. Rs.93,750

Answer:

Particulars	**Calculation**	**Amount**
Direct Material	1,50,000 x 10 x 60%	9,00,000
Direct wages	1,50,000 x 10 x 10%	1,50,000
Overheads	1,50,000 x 10 x 20%	3,00,000
Cost of Production		**13,50,000**
Work in Progress	$(100\% \text{ x } 9{,}00{,}000 + 50\% \text{ x } 4{,}50{,}000)\text{x}\frac{1}{12}$	93,750

Example:

A proforma cost sheet of a Company provides the following data:

Particulars	**Amount**
Raw material cost per unit	117
Direct labour cost per unit	49
Factory overheads cost per unit (includes depreciation of Rs.18 per unit at budgeted level of activity)	98
Production	78,000 units

Example:

Following additional information is available:

Average work in process stock	2 weeks
DOC for material	80%
DOC for labour and overheads	60%

How much is the work-in-progress under cash cost method?

a. Rs.7,92,000
b. Rs.5,71,500
c. Rs.5,45,400
d. Rs.5,13,000

Answer:

Closing WIP $= \big((78{,}000 \text{ x } 117 \text{ x } 80\%) + (78{,}000 \text{ x } (49 + 80) \text{ x } 60\%)\big) \text{x} \frac{2}{52} = Rs.\ 5{,}13{,}000$

Example:

Production cycle is of ½ month. Production process requires full unit of X and Y in the beginning of the production. Z is required only to the extent of half unit in the beginning and the remaining half unit is needed at a uniform rate during the production process. What will be the DOC for valuation of closing WIP?

a. 100% for Material X, Y and 50% for Material Z
b. 75% for Material X, Y and 50% for Material Z
c. 100% for Material X, Y and 75% for Material Z
d. 50% for Material X, Y and Z

Answer:

- WIP valuation is based on degree of completion. We normally take 100% degree of completion for material and 50% for others. **However, in this question DOC will be 100% for material X and Y only.**
- Only 50%of Material Z cost is incurred at the start (50%) and balance 50% is incurred evenly. **Hence relevant DOC for material Z will be original 50% and half of balance 50%. Relevant DOC = 50% + (50%/2) = 75%**

Example:

The company is planning a second shift of manufacturing. Second shift will result in doubling of production. Which of the below statement is not true?

a. Stock of raw material will double
b. Stock of WIP will double
c. Stock of FG will double

Answer:

- Stock of WIP will double
- Double shift will not lead to increased WIP as the amount of stock in process will remain same even after second shift of manufacturing

8. Safety Margin

- Safety margin is added to the estimated working capital to cover unforeseen contingencies. This will enable the company to have flexibility in case of increase in operating cycle

Example:

- Working capital forecast = Rs.8,00,000
- **Option 1:** Safety margin = 20% on base amount
- **Option 2:** Safety margin = 20% on final WC requirement including contingencies

Answer:

- Provision for contingency under option 1 = 8,00,000 x 20% = 1,60,000

Option 2:

Particulars	Amount
WC forecast (80)	8,00,000
Add: Provision for contingency (20)	2,00,000
Final Working capital (100)	10,00,000

9. Maximum Permissible Bank Finance (MPBF)

There are three methods to compute MPBF:

- Method 1 = 75% of Current Assets – 75% of Current Liabilities
- Method 2 = 75% of Current Assets – 100% of Current Liabilities
- Method 3 = 75% of Non-core current Assets – 100% of Current Liabilities

Example:

Current Assets = Rs.25,00,000; Current Liabilities = Rs.10,00,000. Core current assets are 20 percent of non-core current assets. How much is MPBF under Method 3?

a. Rs.5,00,000
b. Rs.7,50,000
c. Rs.5,62,500

d. Rs.11,25,000

Answer:

- Core current Assets + Non-core Current Assets = Total current Assets
- 0.2 Non-core Current Assets + Non-core Current Assets = Total current Assets
- 1.2 Non-core Current Assets = 25,00,000
- Non-core current assets = 25,00,000/1.20 = 20,83,333
- MPBF = 75 percent of non-core current assets – 100% of current liabilities
- MPBF = (0.75 x 20,83,333) – (100% x 10,00,000) = **Rs.5,62,500**

10. Optimum Cash Balance

This is similar to EOQ. A company incurs the following expenses relating to cash management:

- **Transfer Cost:** Incurred to convert Bank/marketable securities into Cash. This is inversely proportional to the optimum cash balance
- **Interest cost:** This is incurred due to maintenance of Cash. This is directly proportional to optimum cash balance

$$\text{Optimum Cash Balance} = \sqrt{\frac{2 \text{ x Annual Demand of Cash x Transfer cost per transfer}}{\text{Opportunity cost per rupee per annum}}}$$

Other related formulae:

$$\text{No of transfers} = \frac{\text{Annual demand of Cash}}{\text{Optimum Cash Balance}}$$

$$\text{Total Transfer Cost} = \text{No of transfers x Transfer cost per transfer}$$

$$\text{Average cash balance} = \frac{\text{Optimum Cash Balance}}{2}$$

$$\text{Total Interest cost} = \text{Average cash balance x Opportunity cost \%}$$

Example:

Sales = Rs.84,00,000; Raw material consumed = 60 percent of sales; All other expenses = Rs.17,40,000; Creditors are paid through net banking and all other expenses are incurred in cash which is withdrawn from bank. The optimum cash balance is determined using Baumol's model. The bank charges Rs.10 for each cash withdrawal. Opportunity cost of capital is 15%. How much is the cash balance?

Answer:

$$\text{Cash} = \sqrt{\frac{2 \text{ x } 17{,}40{,}000 \text{ x } 10}{0.15}} = Rs.\,15{,}232$$

Example:

K Ltd. has a Quarterly cash outflow of Rs. 9,00,000 arising uniformly during the Quarter. It plans to meet the demands for cash by periodically selling marketable securities. The marketable securities are generating a return of 12% p.a. Transaction cost of converting investments to cash is Rs. 60. How much is the Average Cash Balance?

a. Rs.60,000
b. Rs.30,000
c. Rs.15,000
d. Rs.7,500

Answer:

$$\text{Optimum cash balance} = \sqrt{\frac{2 \text{ x } (4 \text{ x } 9{,}00{,}000) \text{x } 60}{0.12}} = \mathbf{Rs.\,60{,}000}$$

Average cash balance = 60,000/2 = Rs.30,000

11. Cash Budget

- A cash budget is a financial tool used by businesses or individuals to forecast and manage their cash flow over a specific period, typically on a monthly or quarterly basis.
- It helps in planning and controlling the inflow and outflow of cash to ensure that there is enough liquidity to meet financial obligations and pursue business goals

Format of Cash Budget:

Particulars	Jan	Feb	Mar
Opening Cash Balance			

Add: Receipts:			
Cash Sales			
Collection from customers			
Sale of Assets			
Other Miscellaneous Receipts			
Total Receipts			
Less: Payments			
Cash Purchases			
Payment to Suppliers			
Payment of wages			
Payment of other expenses			
Total Payments			
Closing Cash Balance			
Add/Less: Loan/deposit adjustment			
Revised cash balance			

Loan/deposit Adjustment:

- In the event of a negative cash balance, an organization may opt to secure a new loan or redeem a deposit to maintain financial stability. Conversely, if the actual cash balance exceeds the minimum threshold set by the company, it may choose to create a deposit or repay existing loans, thereby effectively managing its surplus cash

Example:

Particulars	February	March
Sales (units)	15,000	20,000
Production (units)	12,000	16,000

The purchase price per kg of raw material is Rs.50. Each unit of finished product requires 2 kg of raw materials which are purchased on credit in the month before they are used in production. Suppliers of raw materials are paid one month after purchase. How much is the payment to supplier in March?

a. Rs.12,00,000
b. Rs.15,00,000
c. Rs.16,00,000
d. Rs.20,00,000

Answer:

- Payment to suppliers in March = Purchases made in February = Based on production of March = 16,000 x 50 x 2 = Rs.16,00,000

Example:

Typically, the company collects 20 per cent of its sales in the month of sale, 70 per cent in the subsequent month, and 10 per cent in the second month after the sale. All sales are credit sales. How much will be the debtors in the month of March if the sales of the previous three months are as under:

Month	Amount	Month	Amount	Month	Amount
January	600	February	1,000	March	650

Answer:

- Debtors = 10 percent of Feb sales + 80 percent of March sales
- Debtors = (10% x 1,000) + (80% x 650) = Rs.620

Example:

The trader sells directly to public against cash payments and to other entities on credit. Credit sales are expected to be four times the value of direct sales to public. He expects 15% customers to pay in the month in which credit sales are made, 25% to pay in the next month and 58% to pay in the next to next month. The outstanding balance is expected to be written off.

	January	February	March
Total sales	6,00,000	6,00,000	8,00,000

How much is the collection from customers in the month of March?

Answer:

- Credit sales = 4 Times of Cash Sales. Hence credit sales = 80 percent of total sales and cash sales = 20 percent of total sales

- Credit sales of January = 6,00,000 x 80% = 4,80,000
- Credit sales of February = 6,00,000 x 80% = 4,80,000
- Credit sales of March = 8,00,000 x 80% = 6,40,000
- **Collection of March Month = [4,80,000 x 58%] + [4,80,000 x 25%] + [6,40,000 x 15%] = 4,94,400**

Example:

The company had closing cash of Rs.90,500 in the month of March. Minimum cash balance is Rs.45,000 and the company wants to keep it at the end of every month around this figure. The excess cash (in multiple of thousand rupees) is being put in fixed deposit. How much is the FD created in the month of March?

a. Rs.45,000
b. Rs.45,500
c. Rs.46,000
d. Rs.44,000

Answer:

- Excess cash = 90,500 – 45,000 = Rs.45,500
- FD is created in multiples of thousands and hence the FD created is Rs.45,000

Example:

The firm had a cash balance of Rs.20,000 on April 1, 2017, which is the minimum desired level of cash balance. Any cash surplus/deficit above/below this level is made up by temporary investments/liquidation of temporary investments or temporary borrowings at the end of each month. The firm has cash balance of Rs.10,000 on April 30, 2017 and cash balance of Rs.25,000 on May 31, 2017. What is the action to be taken by company?

Answer:

- The company has cash balance of only Rs.10,000 in April 2017 and hence will have to either take temporary borrowing of Rs.10,000 or liquidation of FD of Rs.10,000 in April
- The company has cash balance of Rs.25,000 in May 2017 and hence will either create FD of Rs.5,000 or repay loan of Rs.5,000.

12. Liquidity vs Profitability

- Liquidity of the company is assessed through current ratio. An organization focusing on liquidity will have lower profitability. This is because investment in fixed assets is more beneficial than investing in current assets
- Profitability can be measured through ratios such as return on equity (or) return on assets (or) return on capital employed
- There are three types of companies/financial managers:

Aggressive	High Profitability	Weak Liquidity
Moderate	Moderate Profitability	Moderate Liquidity
Conservative	Low Profitability	Strong Liquidity

Example:

Fixed Assets = 10 Crores; Current Liabilities = 2.5 Crores; Current Assets = 20% of revenues; Revenues = Rs.50 Crores; Equity share capital = 7.5 Crores; Balance amount is funded with 10% debt. How much is ROE if EBIT is 20% of revenues and tax rate is 40%?

a. 80%
b. 72%
c. 60%
d. 40%

Answer:

Particulars	**Calculation**	**Amount**
Revenues		50.00
EBIT	50.00 x 20%	10.00
Less: Interest	10.00 x 10%	-1.00
EBT		**9.00**
Less: Tax @ 40%		-3.60
EAT		**5.40**
Equity		7.50
ROE	$\frac{5.4}{7.5} \times 100$	**72.00%**

Note:

Debt = FA + CA – CL – Equity = 10 + 10 – 2.5 – 7.5 = Rs.10 Crores

Return on current Assets is 4 percent per annum and return on fixed assets is 15 percent per annum. Cost of current liabilities is 3 percent per annum and cost of long-term liabilities is 8 percent per annum. The company currently has fixed assets is Rs.2,000 lacs and current assets is 1,000 lacs. Working capital is 1,000 lacs. How much is the net profit of the company?

a. Rs.340 lacs
b. Rs.310 lacs
c. Rs.100 lacs
d. Rs.150 lacs

Answer:

Particulars	Calculation	Amount
Return on fixed Assets	2,000 lacs x 15%	300.00
Return on current Assets	1,000 lacs x 4%	40.00
Less: Cost of current liabilities WC = CA – CL; 1,000 = 1,000 – CL; CL = 0	0 CL	0.00
Less: Cost of long-term liabilities	3,000 lacs x 8%	-240.00
Net Profit		**100.00**

13. Evaluation of Credit Policy

- Credit Policy refers to the amount of credit to be provided to the customer. An organization benefits in the form of increased sales when credit is extended
- On the other side, it has to incur various expenses such as bad debt, credit administration cost, cash discount, interest cost etc due to extension of credit
- We will have to do a cost-benefit analysis to decide on the credit terms

Format for evaluation of credit policy:

Particulars	Option 1	Option 2	Option 3
Sales	XXX	XXX	XXX
Less: Variable cost	(XXX)	(XXX)	(XXX)
Less: Fixed cost	(XXX)	(XXX)	(XXX)
Gross Benefit	**XXX**	**XXX**	**XXX**
Less: Bad debt	(XXX)	(XXX)	(XXX)
Less: Cash discount	(XXX)	(XXX)	(XXX)
Less: Credit Admin cost	(XXX)	(XXX)	(XXX)
Less: Interest Cost	(XXX)	(XXX)	(XXX)
Net Benefit	**XXX**	**XXX**	**XXX**

Note:

- Bad debt = Amount of credit sales x Bad debt %
- Cash discount = Amount of Sales x cash discount % x % of people opting for it
- Credit Admin Cost = As given in question
- Interest cost = Amount of debtors x Opportunity cost % (or) cost of capital (or) cost of long-term funds (or) Return on investment

How is debtors calculated?

$$\text{Debtors based on Sales} = \text{Sales} \times \frac{CP}{365}$$

$$\text{Debtors based on Full cost of Sales} = (\text{Variable cost} + \text{Fixed cost}) \times \frac{CP}{365}$$

$$\text{Debtors based on variable cost of Sales} = \text{Variable cost} \times \frac{CP}{365}$$

Note:

- If problem is silent, we will have to write an assumption on how debtors are calculated. We normally assume debtors are valued based on full cost of sales

Example:

Sales	21,000 units

Selling price per unit	Rs.40
Variable cost per unit	Rs.25
Total cost per unit	Rs.35
Credit period allowed	One month

The Company proposes to increase the credit period allowed to its customers from one month to two months. It is envisaged that the change in the policy as above will increase the sales by 8%. The company desires a return of 25% on its investment. How much is the interest cost if debtors are valued based on sales?

Answer:

- Existing interest cost = 21,000 x 40 x (1/12) x 25% = Rs.17,500
- Revised interest cost = 22,680 x 40 x (2/12) x 25% = Rs.37,800

Example:

Currently, the firm has annual credit sales of Rs.50 lakhs and accounts receivable turnover ratio of 4 times a year. The company's variable costs are 70% of the selling price. The firm is required to give a return of 25% on the investment in new accounts receivables. How much is the interest cost if debtors are valued based on full cost of sales?

a. Rs.3,12,500
b. Rs.2,18,750
c. Rs.2,50,000
d. Rs.3,00,000

Answer:

- Debtors based on full cost of sales = (50,00,000 x 70%)/4 = Rs.8,75,000
- Interest cost = 8,75,000 x 25% = Rs.2,18,750

Example:

The sales manager of a company proposes to sell goods to a group of new customers with 10% risk of non-payment. This group would require one and a half months credit and is likely to increase sales by Rs.1,00,000 p.a. Production and Selling expenses amount to 80% of sales and the income-tax rate is 50%. Find the degree of risk of non-payment that the company should be willing to assume if the required rate of return (after tax) were 30%.

a. 10%
b. 6%
c. 8%
d. 14%

Answer:

Particulars	**Amount**
Sales	1,00,000
Less: Production and selling expenses	-80,000
Gross Benefit	**20,000**
Less: Bad debt (bal figure)	-14,000
Profit before tax (PAT/(1-Tax))	**6,000**
Less: Tax @ 50%	-3,000
Profit after tax (Debtors x ROI)	**3,000**
Debtors (Full cost x 1.5/12)	10,000
Return on investment (Given)	**30%**
Degree of risk of non-payment (Bad debt/sales x 100)	**14%**

Example:

A company would do sales of Rs.15,00,000 with a customer. The payment pattern of the customer is as under:

Particulars	**Pattern of Payment Schedule**
At the end of 30 days	15% of the bill
At the end of 60 days	34% of the bill
At the end of 90 days	30% of the bill
At the end of 100 days	20% of the bill
Non-recovery	1% of the bill

Cost of sales is Rs.14,55,000. The opportunity cost of capital is 24%. How much is the annual interest cost on this customer?

Answer:

Particulars	15% of sales	34% of sales	30% of sales	20% of sales
Full cost of Sales (14,55,000 x %)	2,18,250	4,94,700	4,36,500	2,91,000
Collection period	30	60	90	100
Debtors (Full Cost x CP/365)	17,938	81,321	1,07,630	79,726
Interest cost (Debtors x Return %)	**4,305**	**19,517**	**25,831**	**19,134**

- **Total interest cost = Rs.68,787**

14. Collection Policy

- The collection policy establishes the ideal level of expenditure a company can allocate towards credit administration to expedite receivables collection.
- While a higher investment in credit administration typically results in reduced bad debt and interest expenses on receivables, it's crucial to note that the escalation in administration costs may counterbalance the advantages gained from decreased bad debt and interest costs.

Example:

Original situation: A Company has sales of Rs.25,00,000. Average collection period is 50 days, bad debt losses are 5% of sales and collection expenses are Rs.25,000. The cost of funds is 15%.

Planned policy: Increase in collection expenses to Rs.50,000 will reduce bad debt to 4% and average collection period to 40 days

Evaluation which of the collection policy is better? [One year consist of 360 days]

a. Current policy
b. Revised policy
c. Indifferent between current and revised policy

Answer:

Particulars	Existing	Revised
Collection expenses	25,000	50,000
Bad debt	1,25,000	1,00,000
Interest cost (Note 1)	52,083	41,667
Total cost	**2,02,083**	**1,91,667**

- Company should go for revised policy

Note 1: Computation of interest cost:

Particulars	Existing	Revised
Sales	25,00,000	25,00,000
Debtors (Sales x CP/360)	3,47,222	2,77,778
Interest cost (Debtors x Return %)	52,083	41,667

15. Cash Discount

- Cash discount is a discount provided by the seller for prompt/early payment
- Customer not opting for discount will have to pay within normal credit period and customer opting for discount will make early payments

Example:

- Credit terms of a company is "1/5 net 30 days". This would mean that customers will get 1 percent discount if payment is done in 5 days. Otherwise the customer should pay in 30 days without discount

Example:

A firm is considering offering 30-day credit to its customers. The firm likes to charge them an annualized rate of 24%. The firm wants to structure the credit in terms of a cash discount for immediate payment. How much would the discount rate have to be?

Answer:

$$\text{Annualized discount} = \frac{100 - X}{X} \times \frac{365}{30} \times 100 = 24; \frac{36,50,000 - 36500X}{30X} = 24$$

$$36,50,000 - 36,500X = 720X; 37,220X = 36,50,000; \mathbf{X} = \frac{\mathbf{36,50,000}}{\mathbf{37,220}} = \mathbf{98.0656}$$

- Amount of cash discount =100 – 98.0656 = 1.9344

- **% of cash discount = (1.9344/100) x 100 = 1.9344%**

Example:

A company is currently having sales of Rs.20,00,000. Present credit terms are 1/10 net 45. 40 percent of the customers pay within 10 days and balance customers pay in 60 days. How much is the amount of annual cash discount?

Answer:

- Amount of cash discount = 20,00,000 x 40% x 1% = Rs.8,000

Example:

A Ltd. is in the manufacturing business and it acquires raw material from X Ltd. on a regular basis. As per the terms of agreement the payment must be made within 40 days of purchase. However, A Ltd. has a choice of paying Rs.98.50 per Rs.100 it owes to X Ltd. on or before 10th day of purchase. How much is the annualized benefit of availing cash discount?

Answer:

$$\text{Annual Benefit} = \frac{1.50}{98.50} \text{x} \frac{365}{30} \text{x } 100 = 18.53\%$$

Example:

The company has been offered credit terms from its major supplier of 3/30, net 90 for purchasing raw materials worth Rs.1,00,000 per month. How much is the annualized benefit of availing cash discount?

Answer:

$$\text{Annualized benefit of Trade Credit} = \frac{3}{97} \text{x} \frac{360}{60} \text{x } 100 = 18.56\%$$

16. Computation of Eligible Lending

Example:

A bank is analysing the receivables of Jackson Company in order to identify acceptable collateral for a short-term loan. The company's credit policy is 2/10 net 30. The bank lends 80 percent on accounts where customers are not currently overdue and where the average payment period does not exceed 10 days past the net period.

Account	Amount	Outstanding in days	Historical average payment period
74	25,000	15	20
91	9,000	45	60
107	11,500	22	24

Compute the amount of eligible lending?

Answer:

- The company provides a normal credit period of 30 days. Any accounts which are overdue (above 30 days) are not eligible for funding. This would mean Account No.91 is not eligible for computing amount to be lent
- Average payment period should not exceed 10 days past the net period. This would mean average payment period should not exceed 40 days. None of the accounts are breaching this
- Accounts eligible for funding = 74 and 107

Account	Amount	80% of amount	Amount lent
74	25,000	20,000	18,000
107	11,500	9,200	8,280
Amount lent			**26,280**

- Final amount lent is 90% of column 3. This is because 10% is deducted for cash discount and returns

17. Factoring

- Factoring is an arrangement wherein the receivables are sold to a third party (factor) for collection
- **Types of factoring:** With recourse factoring (Bad debt risk continues with company) and without recourse factoring (bad debt risk moves to factor)
- **Benefits of factoring:** Saving in cash discount (assuming factor bears this) + Saving in bad debt (in non-recourse factoring) + saving in credit admin cost + saving in interest cost
- **Costs of factoring:** Commission cost (% of sales) and interest cost

18. Format for computation of Effective Cost of Factoring

Example:

A Ltd. has total sales of Rs.3.2 crores and its average collection period is 90 days. The past experience indicates that bad-debt losses are 1.5% on sales. The expenditure incurred by the firm in administering its receivable collection efforts are Rs.5,00,000. A factor is prepared to buy the firm's receivables by charging 2% commission. The factor will pay advance on receivables to the firm at an interest rate of 18% p.a. after withholding 10% as reserve. Calculate the effective cost of factoring to the Firm.

Answer:

Note 1: Computation of Amount Lent by Factor:

Particulars	Calculation	Amount
1. Credit sales		3,20,00,000
2. Average collection period		90 days
3. Amount of debtors	**3,20,00,000 x (90/360)**	**80,00,000**
4. Less: Reserve	80,00,000 x 10%	-8,00,000
5. Less: Commission	80,00,000 x 2%	-1,60,000
6. Amount eligible to be lent		**70,40,000**
7. Less: Interest	70,40,000 x 18% x (90/360)	-3,16,800
8. Amount actually lent		**67,23,200**

Note 2: Computation of effective cost of factoring:

Particulars	Calculation	Amount
A. Costs:		
Commission	3,20,00,000 x 2%	6,40,000
Interest	70,40,000 x 18%	12,67,200
Total Costs		**19,07,200**
B. Benefits		
Saving in bad debt	3,20,00,000 x 1.5%	4,80,000
Saving in admin cost		5,00,000
Total benefits		**9,80,000**
Effective cost of factoring (in Rs.)	**19,07,200 - 9,80,000**	**9,27,200**
Amount lent by factor	WN 1	67,23,200
Effective cost of factoring (in %)		**13.79**

Example:

Effective cost of factoring is 13.79 percent and the cost of bank loan is 12 percent. What should be the decision of the company?

a. Go for factoring arrangement
b. Go for bank loan
c. Indifferent between factoring and bank loan

Answer:

The company should go for bank loan arrangement as the cost of bank loan is lower than effective cost of factoring

19. Average Collection Period

Let us assume a company is offering credit terms of 1/10 net 45. Compute Average collection period in following situations:

80 percent avail discount and 20 percent does not avail	ACP = (80% x 10 days) + (20% x 45 days) = 17 days
50 percent avail discount and balance 30 percent pay on 45th day and another 20 percent pay on 75th day	ACP = (50% x 10) + (30% x 45) + (20% x 75) = 33.5 days

20. Cost of loan with compensating balance

- With compensating balances, a portion of the loan obtained from the bank must be retained by the borrower with the bank.
- For instance, if we secure a loan of Rs.100, we're obligated to pay interest on the full amount. Yet, considering a 10% compensating balance requirement, only Rs.90 is available for withdrawal from the bank.

- Consequently, the effective borrowing rate for the company rises due to this reduced availability of funds.

Example:

The Company's bank will lend Rs.2,00,000 at 15%. A 10% compensating balance will be required, which otherwise would not be maintained by the company. How much is the effective interest cost?

Answer:

Since the compensating balance would not otherwise be maintained, the real annual cost of taking bank loan would be:

$$\text{Cost of Bank loan} = \frac{15}{90} \text{ x } 100 = 16.67\%$$

Example:

The Company's bank will lend Rs.2,00,000 at 15%. A 10% compensating balance will be required, which otherwise would have been only Rs.5,000.

Answer:

Since the compensating balance would not otherwise be maintained, the real annual cost of taking bank loan would be:

- Real loan taken = 2,00,000 – (2,00,000 x 10% - 5,000) = 1,85,000

$$\text{Cost of Bank loan} = \frac{2{,}00{,}000 \text{ x } 15\%}{1{,}85{,}000} \text{ x } 100 = 16.22\%$$

Summary Theory Notes

Chapter 1 – Scope and Objectives of Financial Management

Introduction:

- Financial management means managing money
- FM is concerned with procurement of funds **(financing decision)** and its effective utilization **(Investment decision)**. Objective is to utilize the assets for earning returns for the investors and distribution of the same **(dividend decision)**
- Financial Management comprises of **forecasting, planning, organizing, directing, coordinating and controlling of all activities** relating to acquisition and application of the financial resources of an undertaking in keeping with its financial objective.

Aspects of financial management:

- **Procurement of funds:** Raising of money by balancing risk, cost and control + Deciding the balance between equity (low risk, high cost and dilution of control) and debt (high risk, low cost and no dilution of control)
- **Effective utilization of funds:** Investment of money in fixed assets and working capital + Balancing of risk and return + Ensuring return on investment is higher than cost of funds

Evolution of financial management:

- **Traditional Phase:** FM was necessary only for occasional events such as merger, acquisition, takeover, liquidation
- **Transitional Phase:** FM was used for day-to-day activities such as fund analysis, budgeting
- **Modern phase:** Development of new areas such as efficient markets, option pricing, valuation models etc

Finance functions:

Long-term Finance Function Decisions:

- **Investment decision:** Selection of assets in which investment is to be done
- **Financing decision:** Acquisition of money for the purpose of investment in fixed assets and working capital
- **Dividend Decision:** Deciding how much of the profits is to be retained and how much to be distributed as dividend

Short-term Finance Function Decisions:

- **Working capital management Decision:** Management of current assets and current liabilities

Need for financial management:

- Maximization of wealth of firm by ensuring proper planning and controlling
- Cost minimization + Revenue maximization + ensuring not to over-invest in assets + balancing of inflow and outflow + tax planning

Scope of FM:

Scope of FM depends on:

- Size of enterprise
- Rate of growth
- Composition of assets and liabilities

Objective of financial management:

Profit Maximization:

- Maximization of profits + Decision making on the basis of profit maximization + Profit maximization cannot be sole objective (vague, ignores risk, ignores time value of money, narrow objective)

Wealth Maximization/Value Maximization:

- Maximization of market value of firm + Better objective + Making profits in ethical manner will lead to wealth maximization
- Considers the need of all stakeholders (shareholder, lender, customer, supplier, employee, Society and Government)

Steps for maximization of shareholder wealth:

- Consider time value of money
- Cost benefit analysis
- Focus on cash flow and not accounting profit

- Focus on all stakeholders
- Take a long-term view

Role of CFO:

- Investment decision
- Financing decision
- Financial analysis and planning (dividend decision based on this)
- Working capital management decision
- Planning
- Budgeting
- Pricing management
- IT and HR function
- Accounting

Financial management and Financial Accounting:

- **Treatment of funds:** Accounting focus on accrual principle whereas financial management focus on cash flows
- **Decision making:** Accounting focus on recording transactions whereas financial management focus on analysis and decision making
- **FM starts where Accounting ends**

Financial distress and insolvency:

- Financial distress refers to a situation where a company is not able to meet its current obligations + It can arise due to high debt
- Financial distress for a longer period can lead to insolvency

Agency Problem:

- Business is owned by shareholders but managed by financial managers
- Managers may focus on their personal goals (increasing salary/perks) as compared to organization goals (maximizing wealth)

Agency Cost:

- Extra cost due to sub-optimal decision making (not acting in the best interest of the company)

Resolving Agency conflict:

- Linking managerial compensation to profits of the organization

Chapter 2 – Types of Financing

Categories of Financial Needs:

- Long-term Financial needs = 5 to 10 years
- Medium-term Financial needs = 1 to 5 years
- Short-term Financial needs < 1 year

Principles while selecting financial sources:

- Matching principle = Long-term financial needs met out of long-term sources and short-term financial needs met out of short-term sources
- Uncertainty element = High uncertainty (equity) – As uncertainty reduces we can gradually move towards debt

Classification of financial sources:

- Based on source (Internal source (Retained earnings) and external source (Equity/Preference/ Debt/Loans etc)
- Based on maturity profile (Long-term, Medium-term and short-term source)

Equity capital (or) External Equity

- Permanent source of capital
- **Advantages:** Permanent capital + Flexibility in paying dividends + Rights issue + enhances ability to take other forms of capital
- **Disadvantages:** Dilution of control and ownership + High cost due to high risk

Preference capital

- Enjoys preferential rights over equity shareholders regarding payment of dividend and repayment of capital
- **Advantages:** No impact on EPS + No dilution of control/ownership
- **Disadvantages:** No tax deduction on dividend + Normally cumulative in nature and hence Preference dividend will have to be paid in later years in case of loss

Retained earnings (or) Internal Equity:

- Permanent source of finance
- Retention of reasonable amount can aid in future growth
- No dilution of control + No extra cost

Debentures:

- **Advantages:** Low cost + Tax deduction on interest + No dilution of control
- **Disadvantages:** Fixed payment + Increase in financial risk

Summary:

Particulars	Equity	Preference	Debt
Risk	Low risk	High risk	High Risk
Cost	High Cost	Medium cost	Low cost
Control	Dilution of control	No dilution	No dilution

Callable Bond vs Puttable Bond:

- Callable Bond = Issuer having the right to redeem the bond before maturity
- Puttable Bond = Investor having the right to ask for redemption before maturity

Other bond categories:

- Floating bond = Bond which pays floating interest based on some benchmark + Interest rate will change when benchmark changes
- Fixed Bond = Bond which pays fixed interest
- Foreign bonds or Euro Bond = Non-INR denominated bonds
- Masala Bonds = INR bond issues to overseas investors
- Treasury bills = Bonds issued by Government – These are risk-free in nature
- Municipal Bonds = Issued for infra development

Commercial Banks:

- Caters to short-term requirements as well as long-term requirements of businesses
- Provides working capital funding as well as long-term funding

Bridge Financing:

- Bridge financing is a short-term loan taken pending disbursement of a long-term loan already sanctioned/likely to be sanctioned
- Loan sanction/disbursement is time-consuming process and hence bridge finance can help in initiating the project
- This is normally repaid out of the long-term loan sanctioned

Venture Capital Financing:

- Venture capital financing involved equity/debt financing for inexperienced entrepreneurs having a new idea
- Source of long-term finance + VC partners also assist in management, planning, providing network contacts

Types:

- Equity Financing
- Conditional loan – No interest on loan + royalty as a percentage of sales is charged
- Income Note – Low interest on loan + Low royalty
- Participating Debentures – No interest during initial (uncertain) phase + as business gets established, interest would be charged and will increase as well

Securitization:

- Securitization is a process of conversion of illiquid assets into marketable one
- Securitization = Origination (Giving loans to borrowers) + Pooling (Similar loans are clubbed together) + Securitization (transfer to SPV + issue of security to investor)
- It is normally non-recourse (bad debt or credit risk will be borne by SPV/investor)

Lease Financing:

- Alternative to purchase of asset + This can be called as renting of asset
- Operating Lease – Lessee is only the user of the asset and the risk and reward or ownership stays with the Lessor + Lessor has to take care of repairs, maintenance etc + It is non-fully payout (entire cost cannot be recovered in single lease) **Example:** Renting of building
- Financial lease – Lesee is the user as well likely to get ownership + Normally fully payout (entire cost recovered in single lease) + This is nothing but a loan in disguise Example: Purchase of Car

Types of Lease arrangements:

- Sales and Leaseback = Owner of the assets sells it to lessor and takes back the same on lease
- Leveraged lease = Lessor procures the asset through debt and gives it on lease
- Sales-aid lease = Lessor helps in marketing or sales of manufacturer product + He gets commission or credit for purchase in return
- Close-ended lease = Asset gets transferred to the lessor at end of lease period + Example (operating lease)
- Open-ended lease = Lessee has the option of getting ownership of the asset at end of lease period

Forms of short-term finance:

- Trade credit
- Accrued expenses and deferred income
- Advances from customers
- Commercial Paper – CP is issued by high-credit worthy companies + Money market instrument (less than a year) + Normally subscribed by banks, mutual funds and financial institutions
- Treasury Bill – Issued by Government
- Certificate of Deposit – Fixed deposit
- Bank advances – Loan from Bank
- Inter-corporate deposits – Loan from other companies
- Public deposits – Loan from Public

Facilities provided by banks:

- Short term loans
- Overdraft
- Clean overdraft = Facility without any security/collateral
- Cash credit
- Advances against goods
- Bills purchased/discounted
- Financing of export trade (Pre-shipment and post-shipment)

Pre-shipment finance (Funding of inventory)

- Loan extended by bank for purchase of raw material, processing and completion of manufacturing for an export order + This is used for funding money needed before shipment of goods
- This normally takes the character of a packing credit
- **Variants:** Clean packing credit + Packing credit against hypothecation of goods + Packing credit against pledge of goods

- **Conditions:** Export Credit Guarantee Corporation (ECGC) cover + Forward contract

Post-shipment finance (Funding of debtors)

- Purchasing or discounting of bills
- Advance against bills sent for collection
- Advance against export incentives

Seed capital:

- Designed by IDBI + Useful for skilled, experience entrepreneurs but lacking financial resources
- Interest is normally not charged + Fixed service charge per annum would be there + Repayments are fixed based on repaying ability of the company
- Normally for projects of less than 2 Crores
- Seed capital Amount = 50 percent of promoter contribution or Rs.15 lacs whichever is lower

Unsecured loans:

- Contribution by promoters in form of unsecured loans
- Rate of interest has to be lower than the interest rate of institutional loans
- USL are sub-ordinate to bank loans (Loans cannot be repaid till bank loans are fully repaid)

Capital Incentives:

- Incentives given by Government for development of backward area
- Incentives can be in form of lump-sum subsidy (or) initial grant (or) indirect tax exemptions (or) direct tax exemptions

Deep Discount Bond or zero -coupon bond:

- Bonds which are issued at huge discount to issue price + Interest is not paid on these bonds as they carry zero coupon

Secured premium Note = Loan + Detachable warrant which can be converted into equity shares

Option Bonds:

- Option for the investor to get interest periodically or at one time on maturity

Inflation Bonds:

- Rate of interest changed based on inflation. It is a form of floating rate bond

ESG Bonds:

- ESG = Environmental (planet) + Social (people) + Governance
- ESG bonds can be issued for projects having good environmental impact (green bonds) or good social impact (social bonds)
- ESG bonds can also be for a specific target and for a longer period + That is combination of both green bonds and social bonds

American Depository Receipt (ADR) vs Global Depository Receipt (GDR) vs Indian Depository Receipt (IDR):

- One DR = Specific number of shares which are deposited with a trust
- Dividends will also be paid on DR
- DR is exactly like an equity share from the point of view of risk and rewards
- ADR is USD denominated + GDR is non-USD denominated (euro/pound) + IDR is INR denominated
- DR will be listed on the local stock exchange

Crowd-funding:

- Raising of money through social media or websites
- This can be in the form of equity funding or donation-based funding
- Crowd-funding intermediary will charge certain fees for the service

Peer-to-peer lending:

- Matching of lenders with borrowers through intermediary. Normally loans are in the form of unsecured nature

Chapter 3 – Financial Analysis and Planning – Ratio Analysis

Introduction:

- Ratio analysis involves comparison of two related items and expressing the same as a mathematical item (% or times or days or ratio)
- **Data Sources:** P&L, Balance sheet, Notes to Accounts, Cash flow statement, Non-financial information
- **Purpose:** To assess performance, identify strengths and weaknesses and for decision making
- **Type of comparison:** Same year, Same company but different years, our company vs competitor, our company vs industry, our company vs economy

Utility of Ratios:

- Shareholders = Profitability Ratio
- Investors = Profitability Ratio and Solvency Ratios
- Lenders = Coverage and Solvency Ratios
- Creditors = Liquidity ratios
- Employees, Financial Manager, Executive Manager = All ratios
- Regulator = Profitability ratios
- Production manager = Input-output ratio, RM consumption ratios
- Sales Manager = Sales related ratio (Sales per employee (or) Sales per square feet)
- Industry specific = Telecom (Revenue per user), Bank (Operating expense and income ratio), Transport (Cost per Tonne KM or Passenger KM), Hotel (Occupancy ratios)

Utility of Ratio Analysis in Decision Making:

- To assess liquidity (Short term solvency)
- To assess long-term solvency
- To assess overall profitability/performance
- To assess effectiveness of usage of resources or operating efficiency
- Inter-firm comparison
- For budgeting (preparation of forecasted financial statements)

Limitations of financial ratios:

- Inflation impact
- Seasonal factors
- Window-dressing
- No standard ratios
- Conclusion from ratios depend on company/industry/state of economy
- Multi-product/segment businesses
- Change in accounting policies

Horizontal analysis and vertical analysis:

- Horizontal analysis = Comparison of year 1 ratio with year 2/3/4 of same company
- Vertical Analysis = Comparison of year 1 ratio with other company/industry/economy ratios

Chapter 4 – Cost of Capital

Introduction:

- Cost of capital = Minimum return required by investors (or) hurdle rate (or) cut-off rate
- **Significance:** Evaluation of investments (or) projects (or) business + Selection of right credit policy

Types of risks:

- **Systematic risk (or) Non-diversifiable risk:** Risk arising due to macro-factors (inflation/interest rate) and which will impact all companies
- **Unsystematic risk (or) Diversifiable risk:** Risk due to specific factors impacting a company and can be eliminated through diversification

Chapter 5 – Financing Decisions – Capital Structure

Capital Structure:

- Capital structure = Combination of debt, equity and preference
- Objective is to minimize cost of capital so that value of firm is maximized

Trade-off Theory:

- Selecting an optimum debt level by considering benefit of debt (tax shield) and cost of debt (financial distress and insolvency)
- Marginal benefit of debt will decline with increase in debt and marginal cost of debt will increase. Hence, we need to have an optimum balance between benefits and costs

Pecking Order Theory:

- Theory focuses on raising debt in case we are positive about business performance and raising equity in case we are doubtful about future performance
- **Priority of raising finance:** Retained earnings (first), Debt (Second) and external equity (last)

Factors Affecting Capital Structure:

- Financial leverage – Raise debt if FL is favourable and Raise equity if FL is unfavourable
- Growth and Stability – Raise debt if business situation is stable
- Cost – Prioritize combination with lowest cost of capital
- Risk – Prioritize equity over debt
- Control – Raise money in such a way that existing control and ownership is not disturbed

Limitation of EBIT-EPS Analysis:

- Risk element is ignored
- EPS is a performance measure and should not be used for decision making

Over-capitalization and Under-capitalization:

- **Over-capitalization:** Available capital > required capital. This will lead to inability in servicing debt and equity (interest and dividend)
- **Under-capitalization:** Available capital < required capital. Inability to do the projects with earning potential

Chapter 6 – Financing Decisions – Leverages

Business risk vs Financial risk:

- Business risk is related to operations of the company and is measured through operating leverage. This impacts EBIT of the company
- Financial risk is the extra risk for equity shareholders due to usage of debt – Measured through financial leverage

Trading on equity:

- Firm has favorable financial leverage if ROI is greater than cost of debt
- Using very high amount of fixed capital in proportion to the equity capital is called as trading on equity. The objective is to enhance returns of equity shareholders

FL – Double edged sword:

- FL is favorable if we earn more than the cost paid – However if returns go down then FL will become unfavorable and would impact EPS/ROE adversely

Chapter 7 – Investment Decisions

Capital Budgeting:

- Identification of project + Evaluation/Analysis of Project + Selection of investment

Need for capital budgeting:

- Substantial expenditure (material) + Irreversible decision + Complex decision (involves estimation of future) + Long-time period + Can lead to winding-up if not handled properly

Process of capital budgeting:

- Planning (identification of investment) + Evaluation (analysis of cash flows) + Selection + Implementation + Review (comparing actual performance with forecast) + Control (taking corrective action)

Types of Decisions:

- **Replacement decision/modernization decision:** Replacing/modernizing an existing asset with a new asset
- **Expansion decision:** Purchase of new assets to expand capacities
- **Diversification:** Entry into new product/services/market
- **Mutually exclusive:** Projects are competing with each other + Selection of one will lead to rejection of others
- **Independent** Projects are not competing with each other + Selection of project is independent of the other project
- **Contingent:** Investment in one project will need investment in other projects

Payback method:

- **Advantages:** Simple + proxy for project risk + Provides estimate of time needed to recover investment
- **Disadvantages:** Ignores time value of money + Ignores cash flow post payback period + Too much emphasis on short-lived projects

Payback reciprocal:

- Inverse of payback period

$$\text{Payback reciprocal} = \frac{\text{Average annual cash flow}}{\text{Initial investment}} \text{ x } 100$$

ARR method:

- **Advantages:** Readily available data + Profits are used for evaluating the performance of management
- **Disadvantages:** Ignores time value of money + Uses profits (subjective) and not cash flows

Discounted payback method:

- **Advantages:** Simple + proxy for project risk + Considers time value of money
- **Disadvantages:** Ignores cash flow post payback period + Too much emphasis on short-lived projects

NPV:

- **Advantages:** Considers time value of money + Considers entire Cash flows + In line with wealth maximization principle
- **Disadvantages:** Complex to compute + Absolute measure (cannot be used to compare projects with un-even investment)

Profitability Index:

- **Advantages:** Relative measure + Useful during capital rationing (divisible projects)
- **Disadvantages:** Fails during capital rationing (indivisible projects)

IRR:

- **Advantages:** Considers cash flows + Time value of money + Easy to understand
- **Disadvantages:** Certain cash flow may not have IRR + Multiple IRR may exist + Project with higher outlay and lower IRR may be better than a project with lower outlay and higher IRR

NPV vs IRR conflict:

Conflict arises due to following reasons:

- **Scale or size disparity:** Large project vs small project
- **Life disparity:** 5-year project vs 10-year project
- **Timing disparity:** Majority cash flows in beginning vs majority cash flow at end

Chapter 8 – Dividend Decisions

Forms of Dividends:

- Cash Dividend – Common way of paying dividends
- Stock Dividend – Distribution of bonus shares in lieu of cash dividends
- Share repurchase (or) Buyback

Significance of Dividend Policy:

- **Long-term financing decision:** Retained earnings can be used for meeting future investment opportunities and hence a dividend decision is also a financing decision
- **Wealth Maximization:** Dividend relevance models links the impact of dividend on valuation of company. Hence it is critical to decide an optimum dividend payout ratio

Determinants of Dividend decisions:

- Requirement of funds and investment opportunities
- Expectations of shareholders
- Taxation impact
- Legal constraints
- ROE vs Ke
- Trend of industry
- Impact on WACC – If we are raising debt (cheapest cost) then we can pay dividends. However, if we are going to issue external equity (highest cost) then it is better to retain earnings (moderate cost)

Practical considerations in dividend policy:

- **Financial needs:** Mature companies (low investment opportunities and hence high payout) and growth companies (high investment opportunities and hence low payout)
- **Constraints:** Legal, liquidity, access to capital markets
- **Desire of shareholders:** Dividend vs Capital gain
- **Stability in dividends:** Constant Dividend per share (or) constant payout ratio (or) constant dividend plus extra dividend

Stock Split:

- Process of splitting a stock of higher face value into multiple stocks of lower face value. **Example:** One share with face value of Rs.100 can be split into five shares of face value of Rs.20
- **Purpose:** To improve liquidity of the shares for small investors
- **Disadvantage:** No real benefit to shareholder, Incurrence of cost for the split process + Share may attract non-serious investors due to lower price

Buyback:

- Companies buying back their own shares either through open market or tender offer
- This will result in decrease of number of equity shares

Chapter 9 – Management of Working Capital

Types of Working Capital:

- **Based on Value:** Gross Working Capital (Current Assets only) and Net Working Capital (Current Assets – Current Liabilities)
- **Based on Time:** Permanent working capital (needed at all times) and temporary working capital (increase/decrease due to fluctuations in demand)

Optimum Working Capital:

- WC required for smooth operations – It should not be excessive as well as inadequate
- **Ideal ratio:** 2 times of current ratio and 1 time of quick ratio

Determinants:

- Policy on cash maintenance
- Inventory – RM stockholding period, Production period and FG stockholding period
- Debtors - Credit policy
- Creditors – Credit policy of supplier
- Seasonality in demand/production
- Demand vs Production Capacity
- Inflationary situation

Factors influencing working capital:

- Nature of industry
- Type of products
- Manufacturing vs trading vs service
- Credit Policy
- Volume of Sales

Treasury management:

- Treasury management = Cash Management + Currency Management + Funding Management + Cash flows Management + Corporate Finance (Managing mergers and acquisitions)
- **Goals:** Maximize return on available cash + Minimize interest cost + Accelerating cash inflows + Adequate cash for meeting expenses/contingencies

Cash Management:

- Managing cash inflows and outflows within and outside organization
- **Goals:** Maximize return on available cash + Adequate cash for meeting expenses/contingencies

Why cash is needed?

- Transaction need = Meeting daily expenses and debt repayments
- Speculative need = To benefit from any sudden lucrative opportunity
- Precautionary need = To take care of unexpected events

Cash Planning and Cash Budget:

- Cash planning is a technique to plan and control the use of cash + This is done through cash flow statement or cash budget
- Cash budget helps in forecasting various transaction needs + Knowing periods of surplus cash/deficit + Investment of surplus cash or usage of same for getting cash discounts

Managing cash collection and disbursements:

- Objective = **Accelerating cash inflows** through tools such as concentration banking (Having multiple places for collecting customer cheques) and Lock-box system (customer can deposit cheque in local post-office) and decelerating cash payments by playing around the float

Float:

- Billing float – time taken by the seller to send invoice
- Mail float – time gap between courier of cheque by us and receipt of same by our supplier
- Cheque processing float – time taken by the supplier to record and deposit the received cheque
- Banking float – time taken by the bank to credit the funds to the supplier

Optimum cash balance:

- Approach 1 = Baumol Model
- Approach 2 = Miller-orr cash management model = Under this approach a lower and upper limit is set + Whenever cash balance touches lower limit we will withdraw money from marketable security and put it in cash + Whenever cash balance touches upper limit we will deposit cash into marketable security

Latest developments in cash management:

- Electronic Fund Transfer

- Zero balance account
- Money market operations = For handling short-term investments (less than a year)
- Petty cash imprest system
- Management of temporary cash surplus
- Electronic Cash management system = Transfer of data as well as funds through information technology
- Virtual banking = Ability to perform banking operations without physically going to the bank + Tools used = ATM, Internet banking

Marketable securities:

- These can be readily converted into cash and hence can play the role of cash itself
- **Characteristics:** Marketable (ability to convert into cash without loss of time and value), safety (minimum risk is the selection criteria) and maturity (matching of maturity with timing of expenses)

Receivables management:

- Managing the receivables of the company
- Ensuring we don't have a very high investment as well as very low investment in receivables
- **Objective:** Maximize the return on investment in debtors (maximum net benefit)

Three aspects:

- Credit Policy
- Credit Analysis = Analysis of the payment patterns of various customer categories
- Control of receivables = Deciding an optimum collection policy

Factors determining credit policy:

- Benefits of extending credit (extra sales) > costs of providing credit (cash discount, bad debt, credit administration, interest cost)

Pledging vs Factoring vs Forfaiting:

- Pledging = Taking a loan from bank or financial institution by pledging the receivables – This would mean the bank will use receivables as a collateral and extend loan - Bank will choose acceptable accounts and provide a specified loan (50 to 90 percent) of the eligible amount
- Factoring = Already explained
- Forfaiting = Normally used in export transactions + Discounting of bills on non-recourse basis by the exporter's bank
- **Steps in Forfaiting:** Sale of goods by exporter + Submission of letter of credit by the importer through importer's bank + Discounting of letter of exchange by the exporter with exporter's bank + Receipt of money + Payment by importer to the exporter's bank

New innovations in receivables management:

- Re-engineered receivables process = Centralization, accelerating inflows
- Use of technology = E-invoicing and E-payments
- Receivables collection policy
- Credit analysis, credit evaluation, credit limits

Monitoring of receivables:

- Computation of average age of Receivables = Debtor days
- Ageing Schedule = Classification of receivables into different buckets such as 0 to 30 days, 31 to 60 days, 61 to 90 days, 91 to 180 days, 6 months to 1 year
- Proper collection policy

Trade Credit:

- **Cost of availing:** Loss of cash discount + Loss of Goodwill + Minimum purchase conditions (buying in excess of EOQ) + Managing cost (like debtor administration, we need to creditor administration as well)
- **Cost of not availing:** Interest cost (trade credit is an interest-free loan which will have to be replaced by a normal loan)

Spontaneous sources vs Negotiated sources:

- **Spontaneous sources:** Naturally arise in business operations Example: Trade credit, outstanding expenses, outstanding wages
- **Negotiated sources:** Specifically negotiated with lenders

Various sources of finance:

- Trade Credit
- Bills payable

- Accrued expenses
- Inter-corporate loans and deposits
- Commercial paper
- Funds generated from operations
- Public deposits
- Bills discounting
- Bills rediscounting