

FINANCING DECISIONS

UNIT – I : COST OF CAPITAL

Question 1

What do you understand by Weighted Average Cost of Capital? (PCC-Nov. 2009)(3 marks)

Answer

Weighted Average Cost of Capital

The composite or overall cost of capital of a firm is the weighted average of the costs of various sources of funds. Weights are taken in proportion of each source of funds in capital structure while making financial decisions. The weighted average cost of capital is calculated by calculating the cost of specific source of fund and multiplying the cost of each source by its proportion in capital structure. Thus, weighted average cost of capital is the weighted average after tax costs of the individual components of firm's capital structure. That is, the after tax cost of each debt and equity is calculated separately and added together to a single overall cost of capital.

Question 2

Z Ltd.'s operating income (before interest and tax) is Rs. 9,00,000. The firm's cost of debt is 10 per cent and currently firm employs Rs. 30,00,000 of debt. The overall cost of capital of firm is 12 per cent.

Required:

Calculate cost of equity.

(PCC-Nov. 2007)(3 marks)

Answer

Calculation of Cost of Equity

$$\begin{aligned}\text{Calculation of value of firm (v)} &= \frac{\text{EBIT}}{\text{Overall cost of capital (K}_o\text{)}} \\ &= \frac{9,00,000}{0.12} = \text{Rs. } 75,00,000\end{aligned}$$

$$\text{Market value of equity (S)} = V - \text{Debts}$$

$$= 75,00,000 - 30,00,000 = \text{Rs. } 45,00,000$$

$$\text{Market value of debts (D)} = 30,00,000$$

$$\begin{aligned} K_e (\text{Cost of equity}) &= K_o \left(\frac{V}{S} \right) - K_d \left(\frac{D}{S} \right) \\ &= 0.12 \left(\frac{75,00,000}{45,00,000} \right) - 0.10 \left(\frac{30,00,000}{45,00,000} \right) \\ &= 0.20 - .067 = .133 \times 100 \\ K_e &= 13.3\%. \end{aligned}$$

Question 3

ABC Ltd. wishes to raise additional finance of Rs. 20 lakhs for meeting its investment plans. The company has Rs.4,00,000 in the form of retained earnings available for investment purposes. The following are the further details:

- ◆ Debt equity ratio 25 : 75.
- ◆ Cost of debt at the rate of 10 percent (before tax) upto Rs. 2,00,000 and 13% (before tax) beyond that.
- ◆ Earning per share, Rs. 12.
- ◆ Dividend payout 50% of earnings.
- ◆ Expected growth rate in dividend 10%.
- ◆ Current market price per share, Rs.60.
- ◆ Company's tax rate is 30% and shareholder's personal tax rate is 20%.

Required:

- (i) Calculate the post tax average cost of additional debt.
- (ii) Calculate the cost of retained earnings and cost of equity.
- (iii) Calculate the overall weighted average (after tax) cost of additional finance.

(PCC-May 2008)(8 marks)

Answer

Pattern of raising capital	=	0.25 × 20,00,000
Debt	=	5,00,000
Equity	=	15,00,000
Equity fund (Rs. 15,00,000)		

Retained earning	=	Rs. 4,00,000
Equity (additional)	=	<u>Rs. 11,00,000</u>
Total	=	<u>Rs. 15,00,000</u>
Debt fund (Rs. 5,00,000)		
10% debt	=	Rs. 2,00,000
13% debt	=	<u>Rs. 3,00,000</u>
Total	=	<u>Rs. 5,00,000</u>

(i) $K_d = \text{Total Interest} (1 - t) / \text{Rs. 5,00,000}$
 $= [20,000 + 39,000] (1 - 0.3) / 5,00,000 \text{ or } (41,300 / 5,00,000) \times 100 = 8.26\%$

(ii) $K_e = \text{EPS} \times \text{payout} / \text{mp} + g = 12 (50\%) / 60 \times 100 + 10\%$
 $10\% + 10\% = 20\%$

$K_r = K_e (1 - t_p) = 20(1 - 0.2) = 16\%$

(iii) **Weighted average cost of capital**

	Amount	After tax	Cost
Equity Capital	11,00,000	20.00%	2,20,000
Retained earning	4,00,000	16.00%	64,000
Debt	<u>5,00,000</u>	8.26%	<u>41,300</u>
Total	<u>20,00,000</u>		<u>3,25,300</u>

$K_o = (3,25,300 / 20,00,000) \times 100 = 16.27\%$

Question 4

The capital structure of MNP Ltd. is as under:

9% Debenture	Rs. 2,75,000
11% Preference shares	Rs. 2,25,000
Equity shares (face value : Rs. 10 per share)	<u>Rs. 5,00,000</u>
	<u>Rs. 10,00,000</u>

Additional information:

- (i) Rs. 100 per debenture redeemable at par has 2% floatation cost and 10 years of maturity. The market price per debenture is Rs. 105.
- (ii) Rs. 100 per preference share redeemable at par has 3% floatation cost and 10 years of maturity. The market price per preference share is Rs. 106.

(iii) Equity share has Rs. 4 floatation cost and market price per share of Rs. 24. The next year expected dividend is Rs. 2 per share with annual growth of 5%. The firm has a practice of paying all earnings in the form of dividends.

(iv) Corporate Income-tax rate is 35%.

Required :

Calculate Weighted Average Cost of Capital (WACC) using market value weights.

(PCC-June 2009)(9 marks)

Answer

Computation of Weighted Average Cost of Capital using Market Value Weights

Cost of Equity (k_e)

$$\begin{aligned} K_e &= \frac{D_1}{P_0} + g \\ &= \frac{\text{Rs. 2}}{\text{Rs. 24} - \text{Rs. 4}} + 5\% \\ &= 15\% \end{aligned}$$

Cost of Debt (k_d)

$$\begin{aligned} K_d &= \frac{I(1-T) + (RV - NP)/N}{(RV + NP)/2} \\ &= \frac{9(1-0.35) + (100 - 98)/10}{(100 + 98)/2} \\ &= \frac{5.85 + 0.20}{99} = 6.11\% \end{aligned}$$

Cost of Preference Shares (k_p)

$$\begin{aligned} K_p &= \frac{PD + (RV - NP)/N}{(RV + NP)/2} \\ &= \frac{11 + (100 - 97)/10}{(100 + 97)/2} \\ &= \frac{11.30}{98.5} = 11.47\% \end{aligned}$$

Calculation of WACC using Market Value Weights

Source of Capital	Market Value (Rs.)	Weights to Total Capital	Specific Cost	Total Cost
Debentures (Rs. 105 per debenture)	2,88,750	0.1672	0.0611	0.0102
Preference Shares (Rs. 106 per preference share)	2,38,500	0.1381	0.1147	0.0158
Equity Shares (Rs. 24 per share)	<u>12,00,000</u>	<u>0.6947</u>	0.1500	<u>0.1042</u>
	<u>17,27,250</u>	<u>1.00</u>		<u>0.1302</u>

WACC using market value weights = 13.02%

Question 5

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.

(PCC-Nov. 2009)(2 marks)

Answer**Computation of Cost of Retained Earnings (K_r)**

$$\begin{aligned}K_r &= k (1-T_p) (1-B) \\K_r &= 0.10 (1-0.30) (1-0.03) \\&= 0.10 (0.70) \times (0.97) \\&= 0.0679 \text{ or } 6.79\%\end{aligned}$$

Cost of Retained Earnings = 6.79%

UNIT – II : CAPITAL STRUCTURE DECISIONS

Question 1

Explain in brief the assumptions of Modigliani-Miller theory. (PCC-May 2007)(2 marks)

Answer

Assumptions of Modigliani – Miller Theory

- (a) Capital markets are perfect. All information is freely available and there is no transaction cost.
- (b) All investors are rational.
- (c) No existence of corporate taxes.
- (d) Firms can be grouped into “Equivalent risk classes” on the basis of their business risk.

Question 2

What is optimum capital structure? Explain. (PCC-Nov. 2007& 2008)(2 marks)

Answer

Optimum Capital Structure: Optimum capital structure deals with the issue of right mix of debt and equity in the long-term capital structure of a firm. According to this, if a company takes on debt, the value of the firm increases upto a certain point. Beyond that value of the firm will start to decrease. If the company is unable to pay the debt within the specified period then it will affect the goodwill of the company in the market. Therefore, company should select its appropriate capital structure with due consideration of all factors.

Question 3

Explain the assumptions of Net Operating Income approach (NOI) theory of capital structure.

(PCC-Nov. 2007)(3 marks)

Answer

Assumptions of Net Operating Income (NOI) Theory of Capital Structure

According to NOI approach, there is no relationship between the cost of capital and value of the firm i.e. the value of the firm is independent of the capital structure of the firm.

Assumptions

- (a) The corporate income taxes do not exist.
- (b) The market capitalizes the value of the firm as whole. Thus the split between debt and equity is not important.
- (c) The increase in proportion of debt in capital structure leads to change in risk perception of the shareholders.

(d) The overall cost of capital (K_o) remains constant for all degrees of debt equity mix.

Question 4

Explain the principles of "Trading on equity".

(PCC-May 2008)(2 marks)

Answer

The term trading on equity means debts are contracted and loans are raised mainly on the basis of equity capital. Those who provide debt have a limited share in the firm's earning and hence want to be protected in terms of earnings and values represented by equity capital. Since fixed charges do not vary with firms earning before interest and tax, a magnified effect is produced on earning per share. Whether the leverage is favourable, in the sense, increase in earning per share more proportionately to the increased earning before interest and tax, depends on the profitability of investment proposal. If the rate of returns on investment exceeds their explicit cost, financial leverage is said to be positive.

Question 5

Discuss the concept of Debt-Equity or EBIT-EPS indifference point, while determining the capital structure of a company.

(PCC-June 2009)(2 marks)

Answer

Concept of Debt-Equity or EBIT-EPS Indifference Point while Determining the Capital Structure of a Company

The determination of optimum level of debt in the capital structure of a company is a formidable task and is a major policy decision. It ensures that the firm is able to service its debt as well as contain its interest cost. Determination of optimum level of debt involves equalizing between return and risk.

EBIT – EPS analysis is a widely used tool to determine level of debt in a firm. Through this analysis, a comparison can be drawn for various methods of financing by obtaining indifference point. It is a point to the EBIT level at which EPS remains unchanged irrespective of debt-equity mix. The indifference point for the capital mix (equity share capital and debt) can be determined as follows:

$$\frac{(EBIT - I_1)(1 - T)}{E_1} = \frac{(EBIT - I_2)(1 - T)}{E_2}$$

Question 6

There are two firms P and Q which are identical except P does not use any debt in its capital structure while Q has Rs. 8,00,000, 9% debentures in its capital structure. Both the firms have earning before interest and tax of Rs. 2,60,000 p.a. and the capitalization rate is 10%. Assuming the corporate tax of 30%, calculate the value of these firms according to MM Hypothesis.

(PCC-Nov. 2009)(3 marks)

Answer

Calculation of Value of Firms P and Q according to MM Hypothesis

Market Value of Firm P (Unlevered)

$$\begin{aligned}V_u &= \frac{\text{EBIT} (1 - t)}{K_e} \\&= \frac{2,60,000 (1 - 0.30)}{10\%} \\&= \frac{\text{Rs. } 1,82,000}{10\%} = \text{Rs. } 18,20,000\end{aligned}$$

Market Value of Firm Q (Levered)

$$\begin{aligned}V_E &= V_u + DT \\&= \text{Rs. } 18,20,000 + (8,00,000 \times 0.30) \\&= \text{Rs. } 18,20,000 + 2,40,000 = \text{Rs. } 20,60,000\end{aligned}$$

UNIT – III : BUSINESS RISK AND FINANCIAL RISK

Question 1

Differentiate between Business risk and Financial risk. (PCC-May 2007 & Nov. 2009)(3 marks)

Answer

Business Risk and Financial Risk

Business risk refers to the risk associated with the firm's operations. It is an unavoidable risk because of the environment in which the firm has to operate and the business risk is represented by the variability of earnings before interest and tax (EBIT). The variability in turn is influenced by revenues and expenses. Revenues and expenses are affected by demand of firm's products, variations in prices and proportion of fixed cost in total cost.

Whereas, Financial risk refers to the additional risk placed on firm's shareholders as a result of debt use in financing. Companies that issue more debt instruments would have higher financial risk than companies financed mostly by equity. Financial risk can be measured by ratios such as firm's financial leverage multiplier, total debt to assets ratio etc.

Question 2

Explain the concept of leveraged lease.

(PCC-Nov. 2007)(2 marks)

Answer

Concept of Leveraged Lease: Leveraged lease involves lessor, lessee and financier. In leveraged lease, the lessor makes a substantial borrowing, even upto 80 per cent of the assets purchase price. He provides remaining amount – about 20 per cent or so – as equity to become the owner. The lessor claims all tax benefits related to the ownership of the assets. Lenders, generally large financial institutions, provide loans on a non-recourse basis to the lessor. Their debt is served exclusively out of the lease proceeds. To secure the loan provided by the lenders, the lessor also agrees to give them a mortgage on the asset. Leveraged lease are called so because the high non-recourse debt creates a high degree of leverage.

Question 3

The following details of RST Limited for the year ended 31March, 2006 are given below:

<i>Operating leverage</i>	<i>1.4</i>
<i>Combined leverage</i>	<i>2.8</i>
<i>Fixed Cost (Excluding interest)</i>	<i>Rs. 2.04 lakhs</i>
<i>Sales</i>	<i>Rs. 30.00 lakhs</i>
<i>12% Debentures of Rs. 100 each</i>	<i>Rs. 21.25 lakhs</i>

Equity Share Capital of Rs. 10 each

Rs. 17.00 lakhs

Income tax rate

30 per cent

Required:

- (i) Calculate Financial leverage
- (ii) Calculate P/V ratio and Earning per Share (EPS)
- (iii) If the company belongs to an industry, whose assets turnover is 1.5, does it have a high or low assets leverage?
- (iv) At what level of sales the Earning before Tax (EBT) of the company will be equal to zero?
(PCC-May 2007)(8 marks)

Answer

(i) Financial leverage

Combined Leverage = Operating Leverage (OL) $\times$ Financial Leverage (FL)

$$2.8 = 1.4 \times FL$$

$$FL = 2$$

Financial Leverage = 2

(ii) P/V Ratio and EPS

$$P/V \text{ ratio} = \frac{C}{S} \times 100$$

$$\text{Operating leverage} = \frac{C}{C - F} \times 100$$

$$1.4 = \frac{C}{C - 2,04,000}$$

$$1.4 (C - 2,04,000) = C$$

$$1.4 C - 2,85,600 = C$$

$$C = \frac{2,85,600}{0.4}$$

$$C = 7,14,000$$

$$P/V = \frac{7,14,000}{30,00,000} \times 100 = 23.8\%$$

Therefore, P/V Ratio = 23.8%

$$\text{EPS} = \frac{\text{Profit after tax}}{\text{No. of equity shares}}$$

$$\begin{aligned}\text{EBT} &= \text{Sales} - V - \text{FC} - \text{Interest} \\ &= 30,00,000 - 22,86,000 - 2,04,000 - 2,55,000 \\ &= 2,55,000\end{aligned}$$

$$\begin{aligned}\text{PAT} &= \text{EBT} - \text{Tax} \\ &= 2,55,000 - 76,500 = 1,78,500\end{aligned}$$

$$\text{EPS} = \frac{1,78,500}{1,70,000} = 1.05$$

(iii) Assets turnover

$$\text{Assets turnover} = \frac{\text{Sales}}{\text{Total Assets}} = \frac{30,00,000}{38,25,000} = 0.784$$

0.784 < 1.5 means lower than industry turnover.

- (iv)** EBT zero means 100% reduction in EBT. Since combined leverage is 2.8, sales have to be dropped by $100/2.8 = 35.71\%$. Hence new sales will be

$$30,00,000 \times (100 - 35.71) = 19,28,700.$$

Therefore, at 19,28,700 level of sales, the Earnings before Tax of the company will be equal to zero.

Question 4

A firm has Sales of Rs. 40 lakhs; Variable cost of Rs. 25 lakhs; Fixed cost of Rs. 6 lakhs; 10% debt of Rs. 30 lakhs; and Equity Capital of Rs. 45 lakhs.

Required:

Calculate operating and financial leverage.

(PCC-Nov. 2007)(2 marks)

Answer

Calculation of Operating and Financial Leverage

	Rs.
Sales	40,00,000
Less: Variable cost	<u>25,00,000</u>
Contribution (C)	15,00,000
Less: Fixed cost	<u>6,00,000</u>
EBIT	9,00,000

Less: Interest	<u>3,00,000</u>
EBT	<u>6,00,000</u>

$$\text{Operating leverage} = \frac{C}{\text{EBIT}} = \frac{15,00,000}{9,00,000} = 1.67$$

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{9,00,000}{6,00,000} = 1.50$$

Question 5

The following data relate to RT Ltd:

	Rs.
Earning before interest and tax (EBIT)	10,00,000
Fixed cost	20,00,000
Earning Before Tax (EBT)	8,00,000

Required: Calculate combined leverage.

(PCC-May 2008)(2 marks)

Answer

Contribution:

$$C = S - V \text{ and}$$

$$\text{EBIT} = C - F$$

$$10,00,000 = C - 20,00,000$$

$$\therefore C = 30,00,000$$

$$\text{Operating leverage} = C / \text{EBIT} = 30,00,000 / 10,00,000 = 3 \text{ times}$$

$$\text{Financial leverage} = \text{EBIT} / \text{EBT} = 10,00,000 / 8,00,000 = 1.25 \text{ times}$$

$$\text{Combined leverage} = \text{OL} \times \text{FL} = 3 \times 1.25 = 3.75 \text{ times}$$

Question 6

A company operates at a production level of 1,000 units. The contribution is Rs. 60 per unit, operating leverage is 6, and combined leverage is 24. If tax rate is 30%, what would be its earnings after tax?
(PCC-Nov. 2008)(3 marks)

Answer

Computation of Earnings after tax

$$\text{Contribution} = \text{Rs. } 60 \times 1,000 = \text{Rs. } 60,000$$

$$\text{Operating Leverage (OL)} \times \text{Financial Leverage (FL)} = \text{Combined Leverage (CL)}$$

$$6 \times \text{Financial Leverage} = 24$$

$$\therefore \text{Financial Leverage} = 4$$

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{60,000}{\text{EBIT}} = 6$$

$$\therefore \text{EBIT} = \frac{60,000}{6} = 10,000$$

$$\text{FL} = \frac{\text{EBIT}}{\text{EBT}} = 4$$

$$\therefore \text{EBT} = \frac{\text{EBIT}}{4} = \frac{10,000}{4} = 2,500$$

Since tax rate = 30%

$$\begin{aligned} \text{Earnings after Tax (EAT)} &= \text{EBT} (1 - 0.30) \\ &= 2,500 (0.70) \end{aligned}$$

$$\therefore \text{Earning After Tax (EAT)} = 1,750$$

Question 7

From the following financial data of Company A and Company B: Prepare their Income Statements.

	Company A	Company B
	Rs.	Rs.
Variable Cost	56,000	60% of sales
Fixed Cost	20,000	-
Interest Expenses	12,000	9,000
Financial Leverage	5 : 1	-
Operating Leverage	-	4 : 1
Income Tax Rate	30%	30%
Sales	-	1,05,000

(PCC-Nov. 2009)(8 marks)

Answer

Income Statements of Company A and Company B

Company A	Company B
Rs.	Rs.

Sales	91,000	1,05,000
Less: Variable cost	<u>56,000</u>	<u>63,000</u>
Contribution	35,000	42,000
Less: Fixed Cost	<u>20,000</u>	<u>31,500</u>
Earnings before interest and tax (EBIT)	15,000	10,500
Less: Interest	<u>12,000</u>	<u>9,000</u>
Earnings before tax (EBT)	3,000	1,500
Less: Tax @ 30%	<u>900</u>	<u>450</u>
Earnings after tax (EAT)	<u>2,100</u>	<u>1,050</u>

Working Notes:

Company A

$$(i) \text{ Financial Leverage} = \frac{\text{EBIT}}{\text{EBIT} - \text{Interest}}$$

$$5 = \frac{\text{EBIT}}{\text{EBIT} - 12,000}$$

$$5 (\text{EBIT} - 12,000) = \text{EBIT}$$

$$4 \text{ EBIT} = 60,000$$

$$\text{EBIT} = \text{Rs. } 15,000$$

$$(ii) \text{ Contribution} = \text{EBIT} + \text{Fixed Cost} \\ = 15,000 + 20,000 \\ = \text{Rs. } 35,000$$

$$(iii) \text{ Sales} = \text{Contribution} + \text{Variable cost} \\ = 35,000 + 56,000 \\ = \text{Rs. } 91,000$$

Company B

$$(i) \text{ Contribution} = 40\% \text{ of Sales (as Variable Cost is 60\% of Sales)} \\ = 40\% \text{ of } 1,05,000 \\ = \text{Rs. } 42,000$$

$$(ii) \text{ Financial Leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$4 = \frac{42,000}{\text{EBIT}}$$

$$\text{EBIT} = \frac{42,000}{4} = \text{Rs. } 10,500$$

(iii) Fixed Cost = Contribution – EBIT
= 42,000 – 10,500 = Rs. 31,500