

**2. Net Operating Income Approach :** This approach has also been suggested by Durand. This is just opposite of Net Income Approach. According to this approach, change in the capital structure of a company does not affect the market value of the firm and the overall cost of capital remains constant irrespective of the method of financing. Under this approach optimal capital structure does not exist as average cost of capital remains constant for varied types of financing mix. According to this approach, the market value of the firm depends upon the net operating profit or EBIT and the overall cost of capital.

**Assumptions :** The Net Operating Income (NOI) approach is based on the following assumptions :

- (i) The overall cost of capital ( $K_0$ ) remains constant for all degrees of debt-equity mix or leverage.
- (ii) The market capitalises the value of the firm as a whole and, therefore, the split between debt and equity is not relevant.
- (iii) The use of debt having low cost increases the risk of equity shareholders. This results in increase in equity capitalisation rate. Thus, the advantage of debt is set off exactly by increase in the equity capitalisation rate.
- (iv) There are no corporate taxes.

**Value of Firm :** The value of a firm on the basis of NOI Approach can be determined as follows :

$$V = \frac{EBIT}{K_0}$$

Where,

$V$  = Value of a Firm

EBIT = Net Operating income or Earnings before interest and tax.

$K_0$  = Overall Cost of Capital

**Value of Equity :** The market value of equity ( $S$ ), can be determined by subtracting the value of debt ( $B$ ) from the total market value of the firm ( $v$ ) i.e.,  $S = V - B$

$$\text{Overall Cost of Capital (K}_0\text{)} : = K_d \left( \frac{B}{V} \right) + K_e \left( \frac{S}{V} \right)$$

**3. Traditional Approach :** NI approach and NOI approach (discussed above) represent two extreme themes to analyse inter-relationship between capital structure decisions, the value of the firm ( $V$ ) and the overall cost of capital ( $K_o$ ). According to NI approach, the debt content in the capital structure affects both the overall cost of capital and total value of the firm while NOI approach suggests that capital structure is totally irrelevant as far as total valuation of the firm is concerned. The traditional approach of capital structure is an intermediary approach which reconciles NI and NOI approaches. It partly contains features of both the approaches as given below:

1. The traditional approach is similar to NI approach to the extent that it accepts that the capital structure or leverage of the firm affects the cost of capital and its valuation. However, it does not subscribe to the NI approach that the value of the firm will necessarily increase with all degree of leverage.

2. It subscribes to the NOI approach that beyond a certain degree of leverage, the overall cost of capital increases resulting in decrease in the total value of the firm. However, it differs from NOI approach in the sense that the overall cost of capital will not remain constant for all degrees of leverage.

Thus, the traditional approach explains that upto a certain point, debt-equity mix will cause the market value of the firm to rise and the cost of capital to decline. But after attaining the optimum level, any additional debt will cause to decrease the market value and to increase the cost of capital. In other words, after attaining the optimum level, any additional debt taken, will offset the use of cheaper debt capital since the average cost of capital will increase alongwith a corresponding increase in the average cost of debt capital.



**Question 7.**

(a) Net Operating Income (EBIT)

Rs. 4,00,000

Overall Capitalisation Rate ( $K_o$ )

10%

$$\begin{aligned}\text{Market Value of the Firm (V)} &= \frac{\text{Net Operating Income}}{\text{Overall Capitalisation Rate}} \\ &= \frac{4,00,000 \times 100}{10} = \text{Rs. } 40,00,000\end{aligned}$$

$$\text{Market Value of Debentures (B)} = \text{Rs. } 10,00,000$$

$$\begin{aligned}\text{Market Value of Equity (S)} &= (V) - (B) = 40,00,000 - 10,00,000 \\ &= \text{Rs. } 30,00,000\end{aligned}$$

$$\begin{aligned}\text{Equity Capitalisation Rate (K}_e\text{)} &= \frac{\text{Earnings to Equity Shareholders}}{\text{Market Value of Equity}} \times 100 \\ &= \frac{(EBIT - I)}{(V) - (B)} \times 100\end{aligned}$$

Equity Capitalisation Rate ( $K_e$ ) :

$$= \frac{\text{EBIT} - I}{S} \times 100 = \frac{\text{Rs. } 2,50,000 - (10\% \text{ of Rs. } 10,00,000)}{5,62,500} \times 100$$

= 26.67% approx.

(c) Decrease in Debt and Increase in Equity :

(i) Calculation of Total Market Value of the Company :

Net Operating Income (EBIT) Rs. 2,50,000

Overall Capitalisation Rate ( $K_o$ ) 16%

Total Market Value of the Company :

$$V = \text{EBIT} / K_o = 2,50,000 / 16\% = \text{Rs. } 15,62,500$$

(ii) Calculation of Equity Capitalisation Rate ( $K_e$ ) :

Total Market Value of the Company (V) Rs. 15,62,500

(-) Total Market Value of the Debt (B) 2,50,000

$$(5,00,000 - 2,50,000)$$

Total Market Value of Equity (S) Rs. 13,12,500

Equity Capitalisation Rate ( $K_e$ ) :

$$= \frac{\text{EBIT} - I}{S} \times 100 = \frac{\text{Rs. } 2,50,000 - (10\% \text{ of Rs. } 2,50,000)}{\text{Rs. } 13,12,500} \times 100$$

$$= \frac{2,25,000}{13,12,500} \times 100 = 17.14\%$$

### Question 9.

Computation of Market Value of Firm, Value of Shares and Average Cost of Capital

Particulars	No Debt	Rs. 2,00,000 6% Debentures	Rs. 3,00,000 8% Debentures
	Rs.	Rs.	Rs.
Net Operating Income (EBIT)	1,20,000	1,20,000	1,20,000
(-) Interest on Debentures	-	12,000	24,000
Earnings for Equity Shareholders	1,20,000	1,08,000	96,000
Equity Capitalisation Rate ( $K_e$ )	10%	12.5%	16%
Market Value of Equity Shares $S = \frac{\text{Earnings for Equity Shareholders}}{K_e}$	12,00,000	8,64,000	6,00,000
Market Value of Debt (Debentures) (B)	-	2,00,000	3,00,000
Market Value of the Firm (V)	12,00,000	10,64,000	9,00,000
Average Cost of Capital = $\frac{\text{EBIT}}{V}$	$\frac{1,20,000}{12,00,000}$ $\times 100 = 10\%$	$\frac{1,20,000}{10,64,000}$ $\times 100 = 11.28\%$	$\frac{1,20,000}{9,00,000}$ $\times 100 = 13.33\%$

### Question 10.

Calculation of Composite Cost of Capital

Debt as % of Total Capital Employed	Cost of Debt %	Cost of Equity %	Composite Cost of Capital %
0	6.0	12.0	$(6.0 \times 0) + (12 \times 1) = 12.00$
10	6.0	12.0	$(6.0 \times 0.1) + (12 \times 0.9) = 11.40$



20	6.0	12.5	$(6.0 \times 0.2) + (12.5 \times 0.8) = 11.20$
30	6.5	13.0	$(6.5 \times 0.3) + (13 \times 0.7) = 11.05$
40	7.0	14.0	$(7.0 \times 0.4) + (14 \times 0.6) = 11.20$
50	7.5	16.0	$(7.5 \times 0.5) + (16 \times 0.5) = 11.75$
60	8.5	18.0	$(8.5 \times 0.6) + (18 \times 0.4) = 12.30$

30% Debt and 70% Equity is the optimal debt-equity mix because in this case the Composite Cost of Capital is minimum i.e., 11.05%.