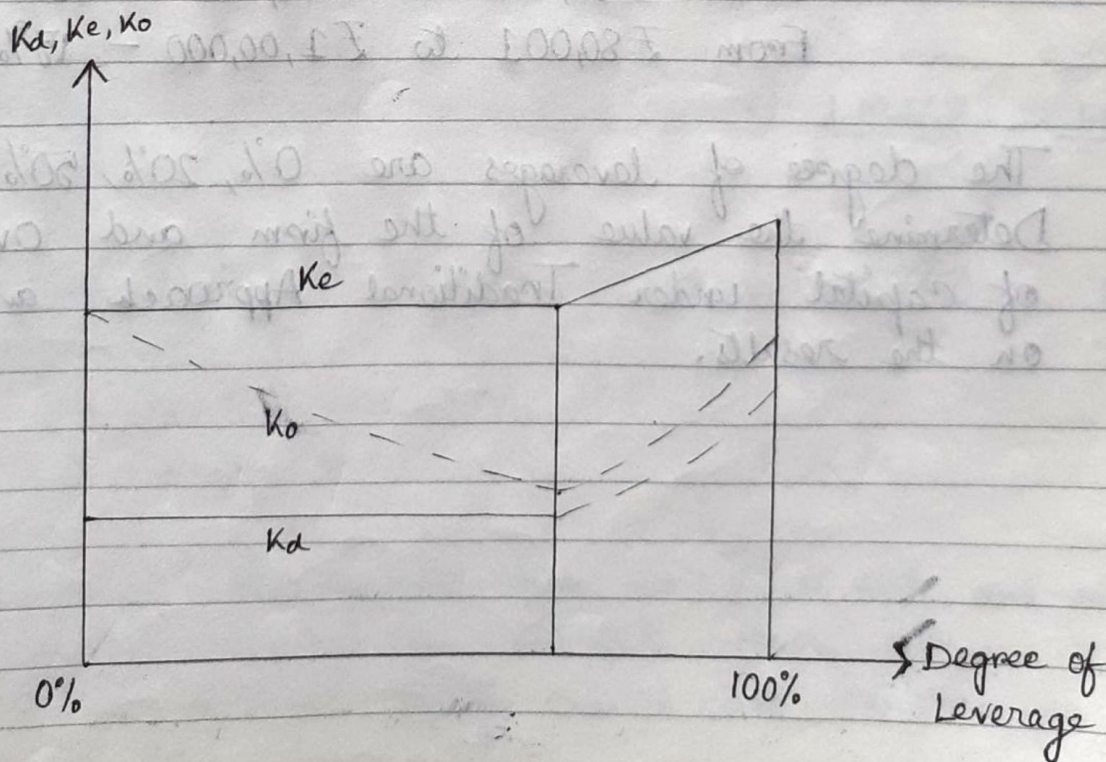


### (c) Traditional Approach

The traditional view of capital structure theory is a midway between the two extreme views of NI and NOI Approach regarding the relationship between cost of capital, leverage and value of a firm.

#### Assumptions -

- i) Cost of debt ( $K_d$ ) and cost of equity ( $K_e$ ) are constant upto a certain level and beyond that level cost of debt and cost of equity will be increased.
- ii) There is no corporate tax.
- iii) The capital structure that gives the highest value of the firm and lowest cost of capital is the optimum capital structure.





## Formulae —

$$i) \text{ Market Value of Debt (D)} = \frac{\text{Interest (I)}}{K_d}$$

$$ii) \text{ Market Value of Equity (E)} = \frac{\text{EBIT} - I}{K_e}$$

$$iii) \text{ Value of the firm (V)} = D + E \\ = \text{Mkt. Value of Debt} + \text{Mkt. Value of Equity}$$

$$iv) \text{ Overall Cost of Capital} = \frac{\text{EBIT}}{V} \times 100$$

E.g. Amount of EBIT = ₹ 15,000

Total Investment = ₹ 1,00,000

### Cost of Equity

Upto ₹ 50,000 of Equity Capital — 15%

From ₹ 50,001 to ₹ 80,000 — 18%

From ₹ 80,001 to ₹ 1,00,000 — 20%

### Cost of Debt

Upto ₹ 50,000 — 10%

From ₹ 50,001 to ₹ 80,000 — 13%

From ₹ 80,001 to ₹ 1,00,000 — 15%

The degree of leverages are 0%, 20%, 50%, 80%, 100%. Determine the value of the firm and overall cost of capital under Traditional Approach and comment on the results.



Soln: Determination of Capital Structure and Value of the firm under Traditional Approach

<u>Particulars</u>	<u>0%</u>	<u>20%</u>	<u>50%</u>	<u>80%</u>	<u>100%</u>
Equity Capital	1,00,000	80,000	50,000	20,000	—
Debt Capital	—	20,000	50,000	80,000	1,00,000
	<u>1,00,000</u>	<u>1,00,000</u>	<u>1,00,000</u>	<u>1,00,000</u>	<u>1,00,000</u>
Cost of Equity ( $K_e$ )	20%	18%	15%	15%	0
Cost of Debt ( $K_d$ )	0	10%	10%	13%	15%
Amount of Interest (I)	<u>0</u>	<u>2,000</u>	<u>5,000</u>	<u>10,400</u>	<u>15,000</u>
EBIT	15,000	15,000	15,000	15,000	15,000
Less: Interest	<u>0</u>	<u>2,000</u>	<u>5,000</u>	<u>10,400</u>	<u>15,000</u>
EBT	<u>15,000</u>	<u>13,000</u>	<u>10,000</u>	<u>4,600</u>	<u>0</u>
Mkt. Value of Debt (D)	0	20,000	50,000	80,000	1,00,000
$\left[ \frac{\text{Interest}}{K_d} \right]$					
Mkt. Value of Equity (E)	75,000	72,222	66,667	30,667	NIL
$\left[ \frac{\text{EBT}}{K_e} \right]$					
Value of the firm (V)	<u>75,000</u>	<u>92,222</u>	<u>1,16,667</u>	<u>1,10,667</u>	<u>1,00,000</u>
$\left[ \frac{\text{D+E}}{\text{D+E}} \right]$					
Overall Cost of Capital ( $K_o$ )	20%	16.27%	<u>12.86%</u>	13.55%	15%
$\left[ \frac{\text{EBIT} \times 100}{V} \right]$					

Comment

Maximum value of the firm is ₹1,16,667 and minimum overall cost of capital is 12.86%. Hence, optimum capital structure is ₹50,000 equity capital and ₹50,000 debt capital.



### Illustration 3.

P Ltd. has the following financial information during a given period :

Earnings before Interest and Taxes (EBIT) ₹ 1,00,000

Total Investments ₹ 5,00,000

Equity Capitalisation Rate/Cost of Equity ( $K_e$ ) :

- |                                  |     |
|----------------------------------|-----|
| (a) with 0% Debt and 100% Equity | 15% |
| (b) with 40% Debt and 60% Equity | 16% |
| (c) with 60% Debt and 40% Equity | 18% |

The firm can raise debt of ₹ 2,00,000 at 10% rate of interest and ₹ 3,00,000 at 12% rate of interest.

Determine the market value of the firm ( $V$ ) and average cost of capital or overall capitalisation rate ( $K_o$ ) under Traditional Approach.

**Solution :**

**Computation of Value of the firm (V) and Overall Cost of Capital ( $K_o$ )  
under Traditional Approach.**

Particulars	(a) 0% Debt	(b) 40% Debt	(c) 60% Debt
Total Investments :			
Debt (₹)	—	2,00,000	3,00,000
Equity (₹)	5,00,000	3,00,000	2,00,000
	5,00,000	5,00,000	5,00,000
EBIT (₹) 1,00,000	1,00,000	1,00,000	1,00,000
Less : Interest on Debt (I) ₹	—	20,000	36,000
Earnings available to equity share holders/Equity earnings ( $E_e$ ) (₹)	1,00,000	80,000	64,000
Equity Capitalisation Rate ( $K_e$ )	15%	16%	18%
Market value of Equity (S) $\left[ \frac{E_e}{K_e} \right]$ (₹)	6,66,667	5,00,000	3,55,556
Market value of Debt (D) (₹)	—	2,00,000	3,00,000
Market value of the firm [ $V = S + D$ ] (₹)	6,66,667	7,00,000	6,55,556
Overall Cost of Capital ( $K_o$ ) = $\left[ \frac{EBIT}{V} \right]$	15%	14.29%	15.25%

**Comment :**

It is clear from the above illustration that with the increase in debt (i.e., leverage) from 0% to 40%, the firm is able to reduce its overall cost of capital ( $K_o$ ) from 15% to 14.29% and the value of the firm (V) increases from ₹ 6,66,667 to ₹ 7,00,000. This is possible as the benefits of raising cheaper debt are available and the  $K_e$  does not rise significantly. However, if more debt is used to finance in place of equity (60%), the value of the firm decreases from ₹ 7,00,000 to ₹ 6,55,556 and  $K_o$  increases from 14.29% to 15.25%.

Therefore, it shows that upto a certain point a firm can, by increasing the proportion of debt in its capital structure, reduce overall cost of capital and raise market value of the firm. Beyond that point, further introduction of debt will cause the overall cost of capital to rise and market value of the firm to fall. Thus, by a judicious mix of debt and equity, the firm can minimise its overall cost of capital and maximise the value of the firm.



### Illustration 18.

Compute the market value of the firm ( $V$ ) and the overall capitalisation Rate ( $K_o$ ) from the following information under Traditional Approach :

The estimated NOI of a company is ₹ 7.5 lakhs and the amount of investment is ₹ 50 lakhs. The cost of equity under different situations are as under : —

- (a) If the company uses no debt 15%
- (b) If the company uses ₹ 20 lakhs debt capital 18%
- (c) If the company uses ₹ 30 lakhs debt capital 20%

The amount of ₹ 20 lakhs debt capital can be raised at 10% interest whereas ₹ 30 lakhs debt capital can be raised at 12% interest. Assume that there will be no corporate taxes.

[Almost similar to C.U. M.Com., 2008]

### Solution :

#### Computation of Market Value of the Firm ( $V$ ) and Overall Capitalisation Rate ( $K_o$ ) under Traditional Approach

Particulars	(a)	(b)	(c)
<b>Total Investments :</b>			
— Debt (₹)	—	20,00,000	30,00,000
— Equity (₹)	50,00,000	30,00,000	20,00,000
	50,00,000	50,00,000	50,00,000
EBIT (₹)	7,50,000	7,50,000	7,50,000
Less : Interest on Debt ( $I$ ) (₹)	—	2,00,000	3,60,000
Earnings available to equity shareholders/Equity Earnings( $E_e$ ) (₹)	7,50,000	5,50,000	3,90,000
Equity Capitalisation Rate ( $K_e$ )	15%	18%	20%
Market Value of Equity ( $S$ ) $\left[ \frac{E_e}{K_e} \right]$ (₹)	50,00,000	30,55,556	19,50,000
Market Value of Debt ( $D$ ) (₹)	—	20,00,000	30,00,000
Market Value of the Firm (₹) [ $V = S + D$ ]	50,00,000	50,55,556	49,50,000
Overall Capitalisation Rate ( $K_o$ ) $\left[ \frac{EBIT}{V} \right]$	15%	14.84%	15.15%

### Comment :

It is evident that if a debt of ₹ 20 lakhs is used the market value of the firm ( $V$ ) increases from ₹ 50,00,000 to ₹ 50,55,556 and the overall cost of capital ( $K_o$ ) decreases from 15% to 14.84%. This is possible as the benefits of employing cheaper debt are available and the  $K_e$  does not rise significantly. But if more debt is used to finance in place of equity, i.e., ₹ 30,00,000 debt capital, the market value of the firm ( $V$ ) decreases from ₹ 50,55,556 to ₹ 49,50,000 and  $K_o$  increases from 14.84% to 15.15%.