

1. Net Income Approach

As per Net Income Approach, there is a relationship between capital structure and value of the firm and therefore firm can affect its value by increasing or decreasing the debt proportion in the overall financing mix.

The Net Income Approach makes the following main assumptions:

1. The total capital requirement of the firm is given and remains constant.
2. Perpetual Debt and equity capital.
3. Cost of debt (K_d) is less than the cost of equity (K_e) and both these costs are constant irrespective of the amount of debt capital used .
4. There are no taxes and no transaction costs.
5. Firm has perpetual life.

Value of Firm = Value of Equity + Value of Debt

$$V = E + D$$

$$E = \frac{\text{Net Income available to equity shareholders}}{\text{Cost of equity}}$$

$$E = \frac{\text{Net Income after interest}}{\text{Cost of equity}}$$

Value of debt is the discounted value of the interest payments made to debenture holders.

$$D = \frac{\text{Net Income available to debtholders}}{\text{Cost of debt}}$$

$$D = \frac{\text{Interest Income}}{\text{Cost of debt}}$$

$$K_o = W_e \times K_d + W_d \times K_d$$

Where:

W_e = proportion of funds invested in equity or weight of equity capital

W_d = proportion of funds invested in debt or weight of debt capital

$$V = \frac{\text{Net Operating Income or EBIT}}{\text{Overall Cost of capital (K}_o\text{)}}$$

If we are given value of a firm and its operating income then we can calculate its overall cost of capital as below:

$$K_o = \frac{\text{Net Operating Income or EBIT}}{V}$$

Example 1

The expected Earnings before interest and taxes (EBIT) of a firm is ₹ 4,00,000. It has issued equity share capital and the cost of equity is assumed to be 10%. It has also issued 8% debt of ₹ 5,00,000. Find out the value of firm and overall cost of capital (WACC) as per Net Income Approach.

Solution:

Here we are given that EBIT = ₹ 4,00,000. $K_e = 10\%$, $K_d = 8\%$ and Value of Debt = ₹ 5,00,000.

EBIT	4,00,000
Less: Interest (8% of ₹ 5,00,000)	40,000
Net Profit available for equity shareholders (EBT)	3,60,000
Cost of Equity (K_e)	10%
Value of Equity (3,60,000/0.10)	36,00,000
Value of Debt	5,00,000
Total Value of Firm	41,00,000

$$\text{Weighted Average Cost of Capital (WACC)} = K_o = \frac{4,00,000}{41,00,000} = 0.097 \text{ or } 9.7\% \text{ (apprx)}$$

Example 2

If in Example 7.1, the firm had issued 8% debt of ₹ 10,00,000 instead of ₹ 5,00,000. Then what is the value of the firm and WACC as per Net Income approach?

Solution

EBIT	4,00,000
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Less: Interest (8% of ` 10,00,000)	80,000
Net Profit available for equity shareholders (EBT)	3,20,000
Cost of Equity (Ke)	10%
Value of Equity (3,20,000/0.10)	32,00,000
Value of Debt	10,00,000
Total Value of Firm	42,00,000

$$\text{Weighted Average Cost of Capital (WACC)} = \frac{4,00,000}{42,00,000} = 0.095 \text{ or } 9.5\%$$

Example 3

If in Example 7.1, the firm has issued 8% debt of only ` 1,00,000, then what would have been firm's value and overall cost of capital as per NI approach.

Solution :

In this case the position of the firm would be as follows:

EBIT	4,00,000
Less: Interest (8% of ` 1,00,000)	8,000
Net Profit available for equity shareholders (EBT)	3,92,000
Cost of Equity (Ke)	10%
Value of Equity (3,92,000/0.10)	39,20,000
Value of Debt	1,00,000
Total Value of Firm	40,20,000

$$\text{Weighted Average Cost of Capital (WACC)} = \frac{4,00,000}{40,20,000} = 0.0995 \text{ or } 9.95\%$$

So, when the value of 8% debt is reduced to ` 1,00,000 the value of firm reduces to ` 40,20,000 and WACC increases to 9.95%.

Capital Structure and Firm Value as per Net Income Approach

As per Net Income Approach there is a relationship between capital structure and firm's value. In fact capital structure affects firm's value and its cost of capital. As per NI approach the higher the proportion of debt capital in capital structure, the lower will be the overall cost of capital and hence the higher will be firm's value.

Optimal capital structure as per NI approach is one that has maximum debt capital or 100% debt capital. As shown in Fig. 7.1, K_e and K_d are constant while $K_d < K_e$. When debt is zero $K_0 = K_e$. However with increase in debt capital K_0 decreases proportionately because $K_e > K_d$. When there is 100% debt, $K_0 = K_d$. At this cost of capital value of firm is maximum.

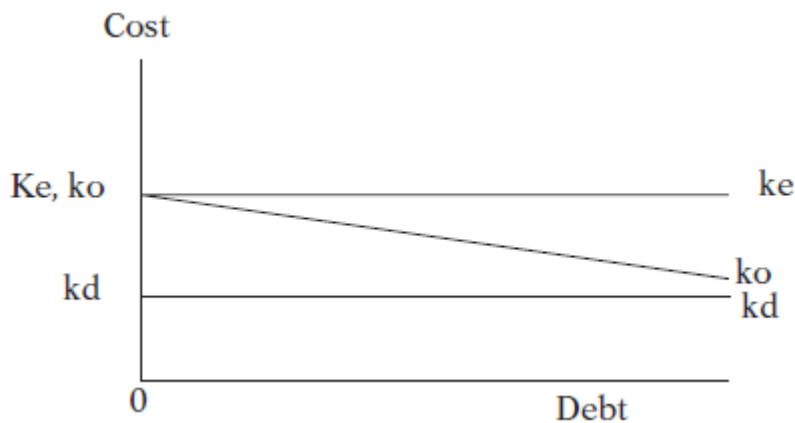


Fig 7.1 : Net Income Approach

2. Net Operating Income Approach

According to Net Operating Income Approach, the market value of the firm is not affected by its capital structure. The value of the firm and its overall cost of capital remains same irrespective of the proportion of debt (or financial leverage) in capital structure.

Assumptions.

1. The overall cost of capital, K_0 , of the firm is known and constant. It depends upon the business risk, which is assumed to be unchanged.
2. The cost of debt, K_d , is known and constant.
3. Using more and more debt in the capital structure, increases financial risk to equity shareholders and results in the increase in the cost of equity capital, K_e . The increase in K_e is such that it completely off sets the benefits of employing cheaper debt.
4. There are no taxes.
5. Firm has perpetual life
6. Debt capital is perpetual.

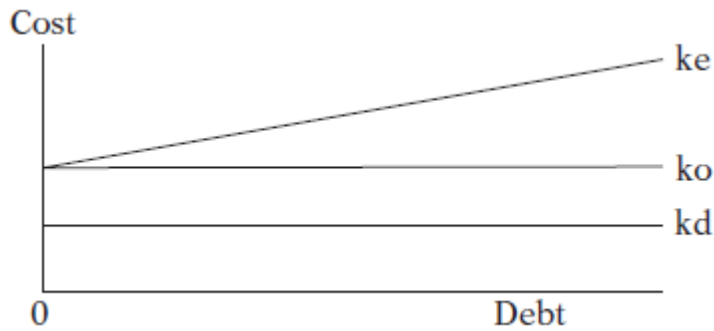


Fig 7.2 : Net Operating Income Approach

$$\text{Value of firm} = \frac{\text{EBIT}}{K_0}$$

Alternatively, Value of the Firm = Value of Equity + Value of Debt

$$K_e = \frac{\text{Net Income after interest}}{\text{Value of equity}}$$

Cost of equity can also be calculated as follows:

$$K_e = K_0 + (K_0 - K_d) D/E$$

Example 7.4

A firm has an EBIT of ₹ 4,00,000 and belongs to a risk class of 10% i.e. its overall cost of capital is 10%. What is the value of equity capital if it employs 5% debt to the extent of 30%, 40% or 50% of the total capital of ₹ 20,00,000? Assume that Net Operating Income approach applies.

Solution:

	30% Debt	40% Debt	50% Debt
EBIT(A)	4,00,000	4,00,000	4,00,000
Overall cost of capital (K ₀)	10%	10%	10%
Value of the firm (V = EBIT/ K ₀)	40,00,000	40,00,000	40,00,000
Value of debt (D) 30%, 40%, 50% of ₹ 20 lacs	6,00,000	8,00,000	10,00,000
Value of Equity (E = V-D)	34,00,000	32,00,000	30,00,000
Interest on debt @5% (B)	30,000	40,000	50,000

Net profit available for equity shareholders (A–B)	3,70,000	3,60,000	3,50,000
Ke (Net profit for equity shareholders / Value of Equity)	10.88%	11.25%	11.67%

The cost of equity capital increases with the increase in the proportion of debt capital.

Cost of Equity can also be calculated using the following formula

$$K_e = K_0 + (K_0 - K_d) D/E$$

$$K_e = 10 + (10 - 5) 6,00,000/34,00,000 = 10.88\%$$

$$K_e = 10 + (10 - 5) 8,00,000/32,00,000 = 11.25\%$$

$$K_e = 10 + (10 - 5) 10,00,000/30,00,000 = 11.67\%$$

Capital Structure and Firm Value as per Net Operating Income Approach

As per Net Operating Income (NOI) Approach there is no relationship between capital structure and firm's value and the two are independent. Hence capital structure does not affect firm's value and its cost of capital. As per NOI approach the proportion of debt capital in capital structure does not affect its overall cost of capital. The higher proportion of debt capital results in higher cost of equity such that the overall cost of capital remains constant.

Prepared by

Dr. Muhammed Rafi.P

Assistant Professor

PG Department of Commerce & Management studies