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COMMERCE
PAPER No.8:FINANCIAL MANAGEMENT
MODULE No. : CAPITAL STRUCTURE THEORIES I – NI APPROACH

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COMMERCE

PAPER No.8:FINANCIAL MANAGEMENT

**MODULE No. : CAPITAL STRUCTURE THEORIES I – NI
APPROACH**

1. Learning Outcomes

After studying this module, we shall be able to:

- Explain the meaning of capital structure
- Understand two schools of thought regarding the relationship between capital structure and firm's value.
- Explain Net Income approach of capital structure
- Calculate the value of an unlevered firm and a Levered firm as per Net Income approach.

2. Introduction

Capital structure is the debt-equity combination in the aggregate capital of the company to finance the firm's assets. Debt and equity differ in cost and risk. From the viewpoint of the company raising funds, debt is considered to be a reasonable source than equity capital. However debt also raises the financial risk of the company as against equity.

As we understand that financial leverage (use of debt financing) affects the shareholders' earnings and risk. Earnings per share (EPS) increases with financial leverage only under favorable economic conditions. But use of debt increases the risk of shareholders also. Therefore, it cannot be expressed with surety whether use of leverage (or debt) will increase the firm's value or not.

The capital structure decision should be inspected from the perspective of its effect on firm's value. If capital structure can alter the utility of firm, then it would like to want a capital structure, which maximizes firm's value. Such a capital structure is called optimum capital structure.

3. Capital Structure and Firm Value: Two schools of thought

There exist two schools of thought on the relationship between capital structure and value of firm. One view is on relevance of capital structure i.e. capital structure affects the firm's value. The capital structure theories which support this view are – Net Income approach and Traditional Approach.

The other school of thought (led by Modigliani and Miller) argue for the irrelevance of capital structure i.e. capital structure is irrelevant in determining the value of firm. A firm's value is independent of its capital structure. Theories which support this view include- Net Operating Income approach, MM Hypothesis and Millers Argument.

We will discuss them one by one.

4. Net Income Approach: Relevance of Capital Structure

The Net Income approach was developed by David Durand (1959). 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. This approach shows that capital structure has relevance in determining the value of firm. Therefore the value of a Levered firm (a firm which uses debt capital) will always be higher than the value of an Unlevered firm (i.e. an all equity firm). Further, the higher the amount of debt capital in the capital structure, the greater will be the firm's value. The Net Income Approach makes the following main assumptions:

1. The total capital requirement of the company is given and remains constant.
2. Cost of debt (K_d) is less than the cost of equity (K_e).
3. Both K_d and K_e remain constant and increase in financial leverage i.e. use of more and more debt financing in the capital structure does not affect the risk discernment of the investors.
4. There are no taxes and no transaction costs.
5. Firm has perpetual life.

Given these assumptions it can be observed that as the proportion of debt capital increases in the total capital of a firm, its overall cost of capital declines continuously. This happens because cost of debt is lower than the cost of equity and irrespective of the degree of financial leverage, these two cost remain constant. Hence as the proportion of debt capital rises, cheaper debt replaces expensive equity capital and the overall cost of capital declines, resulting in increase in firm's value. In fig 1, one can observe that as more and more of debt capital is used, the overall cost of capital declines because cheaper debt replaces expensive equity capital. Decline in overall cost implies that the market value of the firm increases with increase in the amount of debt capital.

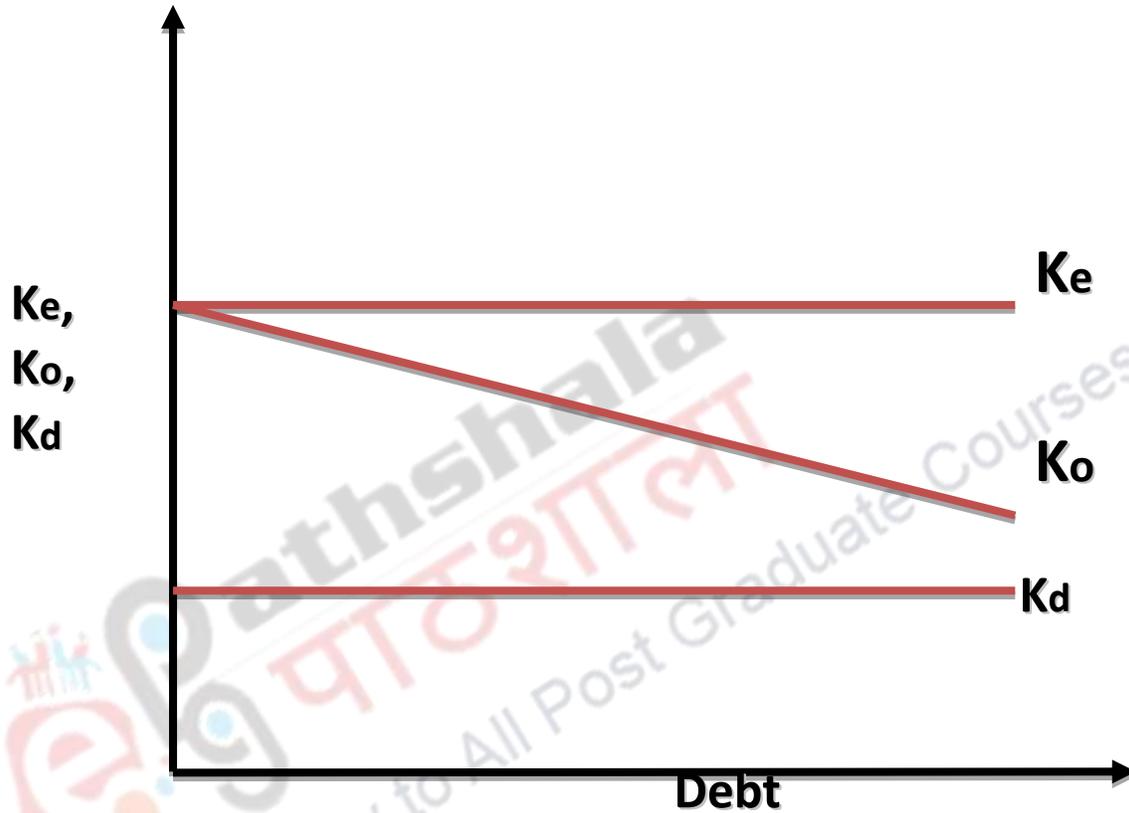


Fig 1: Net Income Approach

We will use the following notations in subsequent equations:

Value of firm = V_F

Value of Equity = E

Value of Debt = D

Interest amount = I

Earnings before interest and Taxes or Net Operating Income (NOI) = $EBIT$

5. Firm Valuation

Using Net Income approach we can calculate the values of a levered and unlevered firm as discussed below:

5.1 Value of a Levered Firm

In case of an unlevered firm debt capital is not used. Hence it is called as an all equity firm. In such a firm, the overall cost of capital (K_o) comprises of only cost of equity (K_e), i.e. the two are equal. Further, there is no interest to be paid by the firm. Therefore the entire net operating income or EBIT is provided to equity shareholders. In such a case the value of the firm will be the capitalized value (or discounted value) of all the operating earnings of the company, with K_e as the capitalization rate (or appropriate discount rate). Hence

$$V_U = \frac{EBIT}{K_e}$$

5.2. Value of a Levered Firm

A levered company is one which uses debt capital in its capital structure. Mathematically, a Firm's value is computed by adding value of equity and value of debt.

Value of a levered Firm = Value of Equity + Value of Debt

$$V_L = E + D$$

Value of Equity = Discounted Value of Net Income available to equity shareholders.

$$E = \frac{\text{Net Income available to equity shareholders}}{\text{Cost of Equity}} = \frac{EBIT - I}{K_e}$$

Value of Debt = Discounted Value of Interest

$$D = \frac{\text{Interest}}{\text{Cost of Debt}} = \frac{I}{K_d}$$

Hence

$$V_L = \frac{NOI - I}{K_e} + \frac{I}{K_d}$$

Further we can calculate the Weighted average cost of capital (WACC) denoted by K_o as below. K_o is also termed as overall cost of capital.

$$K_o = W_e * K_e + W_d * K_d$$

Where:

W_e = proportion of equity capital

W_d = proportion of debt capital

When we are given the Net operating income (NOI or EBIT) of a firm and its market value (V) then the following identity holds true:

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

As per NI approach the optimum capital structure (i.e. the one having minimum overall cost of capital) is one when 100% debt financing is used. This will enhanced the value of the firm. However NI approach is criticized condemned because of its impracticable suppositions. In real life we cannot have constant cost of equity and debt. Further, presence of taxes and transaction costs also distort the link betwixt capital structure and firm's value.

6. Calculating Value of a Firm using NI approach

We can understand the working of Net Income Approach through the hypothetical example given below.

Example:

The expected Earnings before interest and taxes (EBIT) of a firm is Rs 2,00,000. It has issued equity share capital and the cost of equity is 10%. It has also issued 6% debt of Rs 5,00,000. Find out the value of company and overall cost of capital (WACC).

Solution:

Here we are given that EBIT = Rs. 200,000. $K_e = 10\%$, $K_d = 6\%$ and Value of Debt = Rs. 500,000.

EBIT	2,00,000
Less: Interest (6% of Rs 5,00,000)	<u>30,000</u>
Net Profit available for equity shareholders (EBT)	1,70,000
Cost of Equity (K_e)	10%
Value of Equity ($1,70,000/0.10$)	17,00,000
Value of Debt	<u>5,00,000</u>
Total Value of Firm	<u>22,00,000</u>

$$\text{Weighted Average Cost of Capital (WACC)} = K_o = \frac{2,00,000}{22,00,000} = 0.09 \text{ or } 9\% \text{ (approx.)}$$

WACC can also be calculated as follows:

$$\begin{aligned} \text{WACC} &= \text{Cost of Equity} \times \text{Weight of Equity} + \text{Cost of Debt} \times \text{Weight of Debt} \\ &= K_e \times \frac{E}{V} + K_d \times \frac{D}{V} \\ &= 0.10 \times \frac{1700000}{2200000} + 0.06 \times \frac{500000}{2200000} = 0.09 \text{ or } 9\% \end{aligned}$$

Now if the company had issued 6% debt of Rs 7,00,000 instead of Rs 5,00,000 the position have been as follows:

EBIT	2,00,000
Less: Interest (6% of Rs 7,00,000)	<u>42,000</u>
Net Profit available for equity shareholders (EBT)	1,58,000

Cost of Equity (Ke)	10%
Value of Equity (158,000/0.10)	15,80,000
Value of Debt	<u>7,00,000</u>

Total Value of Firm 22,80,000

Weighted Average Cost of Capital (WACC) = $\frac{2,00,000}{22,80,000} = 0.087$ or 8.7%

So, if 6% debt is increased from Rs 5,00,000 to Rs 7,00,000 the value of firm increases from Rs 22,00,000 to Rs 22,80,000 and WACC decreases from 9% to 8.7%.

Now suppose that the company has issued 6% debt of Rs 2,00,000 only instead of Rs 5,00,000. The position would be as follows:

EBIT	2,00,000
Less: Interest (6% of Rs 2,00,000)	<u>12,000</u>
Net Profit provided to equity shareholders (EBT)	1,88,000
Cost of Equity (Ke)	10%
Value of Equity (188,000/0.10)	18,80,000
Value of Debt	<u>2,00,000</u>
Total Value of Firm	<u>20,80,000</u>

Weighted Average Cost of Capital (WACC) = $\frac{2,00,000}{20,80,000} = 0.096$ or 9.6%

So, when the proportion of 6% debt is reduced to Rs 2,00,000 the value of firm reduces to Rs 20,80,000 and WACC increases from 9% to 9.6%.

Thus, as per Net Income Approach a firm can increase its value and decrease its WACC by increasing the debt proportion in its capital structure. Therefore, there is a direct relationship between debt and value of firm and negative relationship between debt and its overall cost of capital (WACC).

7. Summary

Capital structure is the debt-equity mix in the to

- There are two schools of thought regarding the capital structure and market value of a firm. (Net income approach, Traditional Approach, Trade off Theory and Signaling Theory).
- The other school of thought states that capital structure is not determining the value of firm (Net Operating Income Approach, Merton Millers Argument).

Net income approach shows that there is a relationship between capital structure and value of the firm and therefore firm value will be increasing or decreasing the debt proportion in

- As per NI approach the higher the value of debt, the higher the overall cost of capital and the greater will be the value of a levered firm will always be higher than unlevered firm.

The optimum capital structure as per NI approach

However NI approach is criticized due to its unre