

Subject	Financial Management
Paper No. and Title	Paper No.8: Financial Management
Module No. and Title	Module No. 23: Capital Structure II: NOI and Traditional Approach
Module Tag	COM_P8_M23

Principal Investigator	Co- Principal Investigator		Co- Principal Investigator and Technical Coordinator
Prof K V Bhanu Murthy Professor Department of Commerce University of Delhi	Dr Jaswinder Singh Principal SGTB Khalsa College University of Delhi	Dr R P Singh Associate Professor Department of Commerce SGTB Khalsa College University of Delhi	Dr Vimal Rarh Deputy Director, Centre for e-Learning and Assistant Professor, Department of Chemistry, SGTB Khalsa College, University of Delhi <i>Specialised in : e-Learning and Educational Technologies</i>
Paper Coordinator	Content Writer		Reviewer
Dr. Vanita Tripathi Assistant Professor, Department of Commerce, University of Delhi	Dr. Vanita Tripathi Assistant Professor, Department of Commerce, University of Delhi		Dr. Ram Pratap Sinha Associate Professor Government College of Engineering and Leather Technology Kolkata-700098 Chief Editor International Journal of Banking, Risk and Insurance
Anchor Institute : SGTB Khalsa College, University of Delhi			

COMMERCE
PAPER No. : 8 Financial Management
MODULE No. : 23 Capital Structure II: NOI and Traditional Approach

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COMMERCE

PAPER No. : 8 Financial Management

MODULE No. : 23 Capital Structure II: NOI and Traditional Approach

1. Learning Outcomes

After studying this module, we shall be able to:

- Elaborate the relevance of capital structure in determining the value of firm
- Explain Traditional approach of capital structure
- Highlight how to make the judicious use of debt and equity in capital structure for maximizing firm's value and minimizing WACC
- Analyze the three stage relationship between capital structure and value of the firm
- Understand the Net Operating Income approach in capital structure

2. Introduction

Capital structure is the debt-equity mix in the total capital of the company to finance the firm's assets. Debt and equity differ in cost and risk.

As debt involves less cost but it is very risky security because of regular interest payments whereas equity are expensive securities but these are safe securities from companies point of view as company has no legal obligation to pay dividend to equity shareholders if it is running in loss.

As we know 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 stated with surety that use of leverage will increase the firm's value or not. The capital structure decision should be evaluated from the view point of its impact on firm's value. If capital structure can alter the value of firm, then the company would like to have a capital structure, which maximizes firm's value.

There exist two views on the relationship between capital structure and value of the firm. One view is on relevance of capital structure (Traditional approach) i.e. capital structure affects the firm's value. And other view is on irrelevance of capital structure (Net operating income approach) i.e. capital structure is irrelevant in determining the value of firm. There are various theories that show the relationship between capital structure and value of the firm.

3. Traditional Approach

As per the traditional approach, a firm should make judicious use of both the debt and the equity to achieve a capital structure which may be called the optimum capital structure. At this capital structure, the overall cost of capital, WACC of the firm will be minimum and the value of the firm maximum. The traditional view point states that the value of the firm increases with increase in financial leverage but up to a certain limit only. Beyond this limit, the increase in financial leverage will increase its WACC and the value of the firm will decline. The reason for decline in WACC is replacement of expensive equity capital with low cost debt. Due to increasing financial risk of equity shareholders, the cost of equity capital starts rising. It is widely held assertion that employment of debt funds is cheaper than the employment of equity funds.

This assertion has the implication that cost of debt plus the increased cost of equity, together on a weighted basis, will be less than the existed cost of equity before debt financing.

Suppose the cost of capital for totally equity financed company is 10%. Cost of equity and cost of capital will be same as company is totally financed with equity capital. If firm replaces 50% of its equity capital with interest bearing 7% debt capital, the cost of equity will increase slightly because of added financial risk of equity shareholders. New cost of equity increases to 11%.

WACC = Cost of Equity × Weight of Equity + Cost of Debt × Weight of Debt

$$\begin{aligned} \text{WACC (K}_o\text{)} &= K_e \times W_e + K_d \times W_d \\ &= 0.11 \times 0.50 + 0.07 \times 0.50 \\ &= 0.09 \text{ or } 9\% \end{aligned}$$

Thus, financial leverage will lower the WACC. But, this decline in WACC will be obtained only up to a point. As leverage will increase further, the risk for equity shareholders will also increase and they will require a higher risk premium and therefore, the cost of equity will increase. This increase in cost of equity will not be able to offset the advantage of lower cost of debt and therefore, after this point WACC will start increasing.

The working of this approach can be best understood from the following hypothetical example:

Example:

ABC Ltd. having an EBIT of Rs 1,50,000 is contemplating to redeem a part of capital by introducing the debt financing.

Presently, it is 100% equity firm with equity capitalization rate K_e of 16%. The firm is to redeem the capital by introducing debt financing up to Rs 3,00,000 i.e. 30% of total funds or up to Rs 5,00,000 i.e. 50% of total funds. It is expected that for debt financing up to 30%, the rate of interest will be 10% and the cost of equity will increase to 17%. However, if the firm opts for 50% debt financing, then interest will be payable at the rate of 12% and cost of equity will be 20%, find out the value of firm and WACC under different levels of debt financing.

	100% Equity	30% Debt	50% Debt
Total debt	3,00,000	5,00,000
Cost of debt	10%	12%
EBIT (Rs)	1,50,000	1,50,000	1,50,000
Less: Interest	30,000	60,000
Profit before tax	1,50,000	1,20,000	90,000
Cost of equity	16%	17%	20%
Value of equity (Profit before tax/Cost of equity)	9,37,500	7,05,882	4,50,000
Value of firm (D+E)	9,37,500	10,05,882	9,50,000
WACC (EBIT/Value of firm)	0.16	0.149	0.158

Thus, we can see from the above table that value of firm increases and WACC goes down with increase in debt but up to a certain limit only i.e. up to 30% debt. But if we employ more than 30% debt, then value of firm goes down and WACC increases. Therefore, firm should make judicious use of both the debt and equity to maximize firm's value and minimize WACC. The

relationship between capital structure and the value of firm can be explained through three stages under traditional approach.

First Stage: Increasing Value

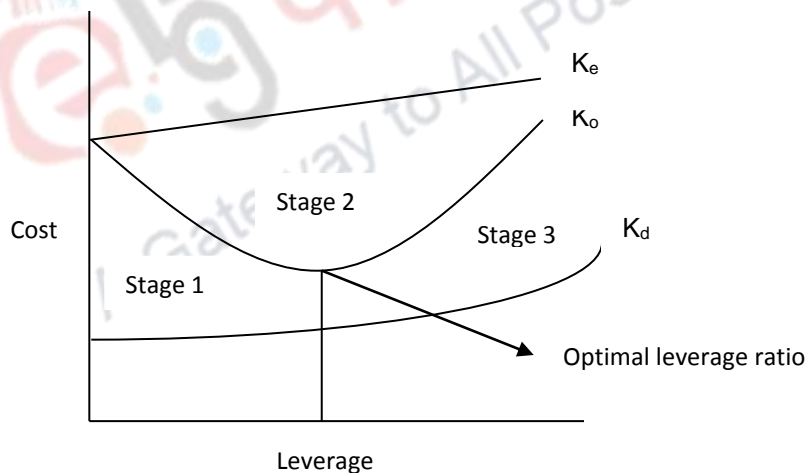
In the first stage, as a company starts moving from all equity to debt financing, the cost of equity (K_e) starts increasing by a very less amount. Thus, this slight increase in cost of equity is not able to set off the advantage of low cost of debt (K_d). The cost of debt also remains constant as the market perceives debt as a reasonable policy. Consequently, the overall cost of capital (WACC or K_o) goes down and thus, the value of the firm increases.

Second Stage: Optimum Value

As the company keeps increasing debt financing, there comes a point which gives optimum value of the firm. In this case, any further increase in debt causes the cost of equity to increase by such an amount which completely off sets the advantage of low cost debt. The result of this is that the WACC shows no change and therefore attains the minimum level. Such a point or range shows the maximum value of the firm due to lowest WACC. At this stage, firm achieves its optimum debt-equity ratio.

Third Stage: Decreasing Value

After reaching the optimum level, any increase in debt results into very large increase in the cost of equity as required by the shareholders for the increased financial risk. Such a large increase in cost of equity is not able to set off the advantage of low cost debt. Moreover, the cost of debt also increases, as a result of which the WACC increases and thus, value of the firm goes down.



Thus, the three stages explained above show that the value of the firm and WACC depend upon the leverage of the firm. In the initial phase an increase in leverage results into decline in WACC due to the comparative advantage of low cost debt. On further increase in leverage, WACC reaches its minimum point beyond which it starts increasing. Therefore, WACC gets a U-shaped

curve which implies that there exist a point where the overall cost of capital is minimum and the value of the firm is maximum. This point signifies the optimal debt-equity ratio.

The main points of traditional approach are:

1. It does not assume cost of equity to be constant. Rather, it increases with increase in financial leverage due to the added financial risk for equity shareholders.
2. WACC is not continuously declining. It declines but up to certain limit only and after that limit it again starts rising.
3. Moderate degree of debt can lower the firm's overall cost of capital and thereby, increase the firm value.
4. The initial increase in the cost of equity is more than offset by the lower cost of debt.
5. But as debt increases, shareholders perceive higher risk and the cost of equity rise until a point is reached at which the advantage of lower cost of debt is more than offset by more

Criticism of Traditional Approach

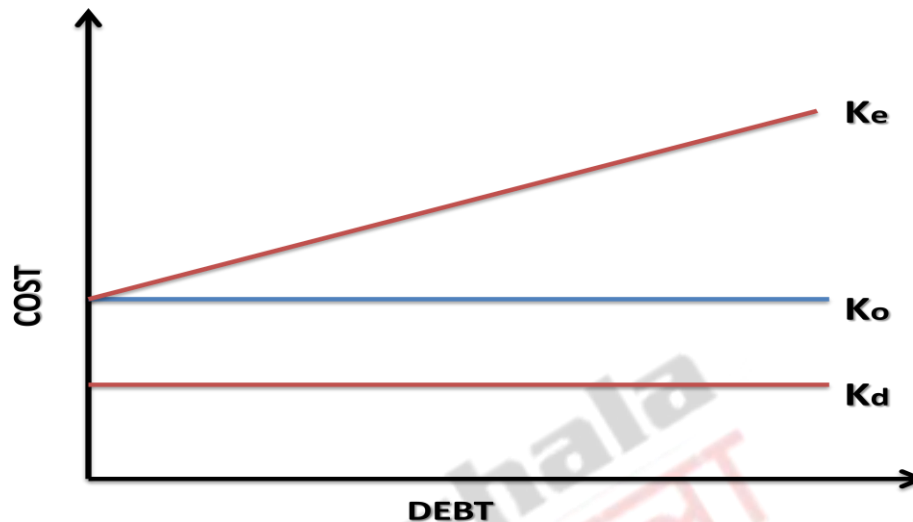
The main criticism of this approach is that its assumption of financial risk premium is not justifiable. The theory explains that increase in risk premium required by equity shareholders is very less up to moderate levels of debt and increases by different amount at different levels of leverage. However, the theory is not able to provide any justification for this.

4. Net Operating Income Approach

The Net Operating Income Approach is opposite to the Net Income Approach. According to Net Operating Income Approach, the market value of the firm depends upon the net operating profit or EBIT and overall cost of capital, WACC. The financing mix or the capital structure is irrelevant and does not affect the value of the firm.

The Net Operating Income Approach makes the following assumptions:

- The investor sees the firm as a whole and thus capitalizes the total earnings of the firm to find the value of the firm as a whole.
- The overall cost of capital, K_o , of the firm is constant and depends upon the business risk, which also is assumed to be unchanged.
- The cost of debt, K_d , is also taken as constant.
- The use of more and more debt in the capital structure increases the risk of shareholder and thus results in the increase in the cost of equity capital, K_e . The increase in K_e is such as to completely off set the benefits of employing cheaper debt.
- There is no tax.



$$\text{Value of the Firm} = \frac{\text{Net Operating Profit}}{\text{WACC}} = \frac{\text{EBIT}}{K_o}$$

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

$$\text{Cost of Equity (Ke)} = \frac{\text{Net Income}}{\text{Value of Equity}}$$

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

Example:

A firm has an EBIT of Rs 2,00,000 and belongs to a risk class of 10%. What is the value of equity capital if it employees 6% debt to the extent of 30%, 40% or 50% of the capital fund of Rs 10,00,000.

	30% Debt	40% Debt	50% Debt
EBIT	2,00,000	2,00,000	2,00,000
Overall cost of capital (K _o)	10%	10%	10%

Value of the firm (V = EBIT/ K _o)	20,00,000	20,00,000	20,00,000
Value of 6% debt (D)	3,00,000	4,00,000	5,00,000
Value of Equity (E = V-D)	17,00,000	16,00,000	15,00,000
Interest on debt	18,000	24,000	30,000
Net profit for equity	1,82,000	1,76,000	1,70,000
Ke (Net profit/E)	10.7%	11%	11.33%

The cost of equity capital (K_e) of 10.7%, 11% and 11.33% can be verified for different proportion of debt by calculating WACC as follows:

For 30% Debt:

$$K_o = 0.107 * \frac{17,00,000}{20,00,000} + 0.06 * \frac{3,00,000}{20,00,000} = 0.10 \text{ or } 10\%$$

For 40% Debt:

$$K_o = 0.11 * \frac{16,00,000}{20,00,000} + 0.06 * \frac{4,00,000}{20,00,000} = 0.10 \text{ or } 10\%$$

For 50% Debt:

$$K_o = 0.1133 * \frac{15,00,000}{20,00,000} + 0.06 * \frac{5,00,000}{20,00,000} = 0.10 \text{ or } 10\%$$

These calculations of WACC testify that the benefit of employment of more and more debt in the capital structure is offset by the increase in equity capitalization rate, K_e.

6. Summary

- Various approaches show that capital structure is relevant as well as irrelevant in determining the value of firm.
- As per traditional approach, a firm should make efficient use of both the debt and equity to achieve the optimum capital structure. The optimum capital structure is one at which firm's value is maximum and WACC is minimum.
- The relationship between capital structure, WACC and value of the firm exists in three stages i.e. increasing value, optimum value and decreasing value.
- In the optimum value stage, the cost of capital is minimum, value of the firm is maximum and optimal leverage ratio is attained.
- The cost of capital under traditional approach is given by a U-shaped curve.
- According to NOI Approach, the market value of the firm depends upon the net operating profit i.e. EBIT and overall cost of capital, WACC.
- The cost of capital under NOI approach is straight horizontal line.