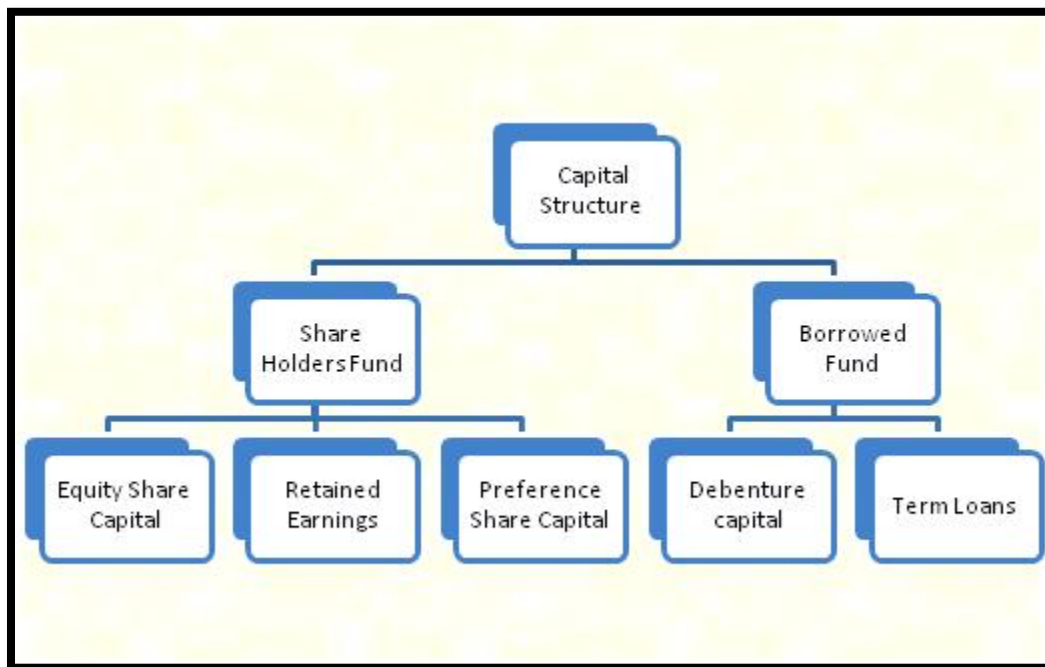


**SEM:VI**  
**Subject: FINANCIAL MANAGEMENT**  
**Chapter:\_CAPITAL STRUCTURE**  
**Teacher:S.BHATTACHARYYA**

Capital structure refers to the proportions or combinations of equity share capital, preference share capital, debentures, long-term loans, retained earnings and other long-term sources of funds in the total amount of capital which a firm should raise to run its business. Capital structure of a company refers to the make-up of its Capitalisation and it includes all long-term capital resources viz., loans, reserves, shares and bonds. Capital structure refers to an arrangement of the different components of business funds, i.e. shareholder's funds and borrowed funds in proper proportion. A business organization utilizes the funds for meeting the everyday expenses and also for budgeting high-end future projects.



## Shareholder's Funds

The owner's funds refer to generating capital by issuing new shares or utilizing the retained earnings to meet up the company's financial requirement. However, it is an expensive means of acquiring funds. The three sources of capital acquisition through shareholder's funds are as follows:

- **Equity Share Capital:** The new shares are issued to the equity shareholders who enjoy the ownership of the company are liable to get dividends in proportion to the profits earned by the company. They are also exposed to the risk of loss associated with the company.
- **Preference Share Capital:** The preference shareholders enjoy a fixed rate of dividends along with preferential rights of receiving the return on capital in case of the company's liquidation, over the equity shareholders. However, they have limited rights of voting and control over the company.
- **Retained Earnings:** The Company sometimes utilize the funds available with it as retained earnings accumulated by keeping aside some part of the profit for business growth and expansion.

## Borrowed Funds

The capital which is acquired in the form of loans from the external sources is known as borrowed funds. These are external liabilities of the firm, which leads to the payment of interests at a fixed rate. However, there is a tax deduction on such borrowings; it creates a burden on the company. Following are the various types of borrowed funds:

**Debentures:** It is a debt instrument which the companies and the Government Issue to the public. Though the rate of interest is quite high on debentures, they are not by any collateral or security.

**Term Loans:** The fund acquired by the company from the bank at a floating or fixed rate of interest is known as a term loan. This is an appropriate source of fund for the companies which have a good and strong financial position.

## Factors Determining Capital Structure

### *1. Cash Flow Position:*

The decision related to composition of capital structure also depends upon the ability of business to generate Sufficient cash flow. A company employs more of debt securities in its capital structure if company is sure of generating Sufficient cash Inflow whereas if there is shortage of cash then it must employ more of equity in its capital structure as there is no liability of company to pay its equity shareholders.

### *2. Interest Coverage Ratio (ICR):*

It refers to number of time companies earnings before interest and taxes (EBIT) cover the interest payment obligation.

$$\text{ICR} = \text{EBIT} / \text{Interest}$$

High ICR means companies can have more of borrowed fund securities whereas lower ICR means less borrowed fund securities.

### *3. Debt Service Coverage Ratio (DSCR):*

It is one step ahead ICR, i.e., ICR covers the obligation to pay back interest on debt but DSCR takes care of return of interest as well as principal repayment.

$$\text{DSCR} = \frac{\text{Profit after tax} + \text{Depreciation} + \text{Interest} + \text{Non Cash Exp. written off}}{\text{Preference Dividend} + \text{Interest} + \text{Repayment obligation}}$$

If DSCR is high then company can have more debt in capital structure as high DSCR indicates ability of company to repay its debt but if DSCR is less then company must avoid debt and depend upon equity capital only.

### *4. Return on Investment:*

Return on investment is another crucial factor which helps in deciding the capital structure. If return on investment is more than rate of interest then company must prefer debt in its capital structure whereas if return on investment is less than rate of interest to be paid on debt, then company should avoid debt and rely on equity capital.

#### *5. Cost of Debt:*

If firm can arrange borrowed fund at low rate of interest then it will prefer more of debt as compared to equity.

#### *6. Tax Rate:*

High tax rate makes debt cheaper as interest paid to debt security holders is subtracted from income before calculating tax whereas companies have to pay tax on dividend paid to shareholders. So high end tax rate means prefer debt whereas at low tax rate we can prefer equity in capital structure.

#### *7. Cost of Equity:*

Another factor which helps in deciding capital structure is cost of equity. Owners or equity shareholders expect a return on their investment i.e., earning per share. As far as debt is increasing earnings per share (EPS), then we can include it in capital structure but when EPS starts decreasing with inclusion of debt then we must depend upon equity share capital only.

#### *8. Floatation Costs:*

Floatation cost is the cost involved in the issue of shares or debentures. These costs include the cost of advertisement, underwriting statutory fees etc. It is a major consideration for small companies but even large companies cannot ignore this factor because along with cost there are many legal formalities to be completed before entering into capital market. Issue of shares, debentures requires more formalities as well as more floatation cost. Whereas there is less cost involved in raising capital by loans or advances.

#### *9. Risk Consideration:*

Financial risk refers to a position when a company is unable to meet its fixed financial charges such as interest, preference dividend, payment to creditors etc. Apart from financial risk business has some operating risk also. It depends upon operating cost; higher operating cost means higher business risk. The total risk depends upon both financial as well as business risk.

If firm's business risk is low then it can raise more capital by issue of debt securities whereas at the time of high business risk it should depend upon equity.

#### *10. Control:*

The equity shareholders are considered as the owners of the company and they have complete control over the company to take all the important decisions for managing the company.

## **Trading on Equity:**

### **Situation I:**

Total Capital = Rs 50 Lakhs

Equity Capital = Rs 50 Lakhs (5, 00,000 shares @ Rs 10 each)

Debt = Nil

Tax rate = 30% p.a.

Earnings before interest and tax (EBIT) = Rs 7, 00,000

### **Situation II:**

Total Capital = Rs 50 Lakhs

Equity Capital = Rs 40 Lakhs (4, 00,000 shares @ Rs 10 each)

Debt = Rs 10 Lakhs

Tax rate = 30% p.a.

Interest on debt = 10%

Earnings before interest and tax (EBIT) = Rs 7, 00,000

### **Situation III:**

Total Capital= Rs 50 Lakhs

Equity Capital = Rs 30 Lakhs (3, 00,000 shares @ Rs 10 each)

Debt= Rs 20 Lakhs

Tax rate = 30% p.a.

Interest on debt = 10%

Earnings before interest and tax (EBIT) = Rs 7, 00,000

Ans:

Calculation of Earnings per share (EPS) in all the situations.

	Situation I	Situation II	Situation III
EBIT (Earnings Before Interest and Tax)	7,00,000	7,00,000	7,00,000
Less: Interest	0	-1,00,000 (10% of 10 lakhs)	-2,00,000 (10% of 20 lakhs)
EBT (Earnings Before Tax)	7,00,000	6,00,000	5,00,000
Less: Tax (30% of EBT)	-2,10,000 (30% of 7 lakhs)	-1,80,000 (30% of 6 lakhs)	-1,50,000 (30% of 5 lakhs)
EAT (Earning After Tax)	4,90,000	4,20,000	3,50,000
EPS (EAT / No. of Equity Shares)	Rs. 0.98 [4,90,000/ 5,00,000]	Rs. 1.05 [4,20,000/ 4,00,000]	Rs. 1.16 [3,50,000/3,00,000]

If we compare the above table we can see that in situation III equity shareholders get maximum return followed by II situation and least earning in I situation. Hence it is proof that more debt brings more income for owners in the capital structure.

**EBIT-EPS analysis:**

If the level of EBIT is low from HPS point of view, equity is preferable to debt. If the EBIT is high from EPS point of view, debt financing is preferable to equity. If ROI is less than the interest on debt, debt financing decreases ROE. When the ROI is more than the interest on debt, debt financing increases ROE.

## Importance of Capital Structure:



**Return Maximisation:** A well-designed capital structure provides a scope of increasing the earnings per share, which ultimately maximizes the return for equity shareholders and recover the cost of borrowings.

**Flexibility:** It also facilitates the expansion or contraction of the debt capital to suit the business strategies and conditions.

**Solvency:** A sound capital structure helps to maintain liquidity in the firm because an unplanned debt capital leads to the burden of interest payments, ultimately reducing the cash in hand.

**Increases Firm's Value:** Investors prefer to put in their money in the company, which has a sound capital structure. Thus, leading to a rise in the market value of the firm's shares and securities.

**Reduces Financial Risk:** Balancing the proportion of debt and equity in the business through capital structure assist the business firms in managing and minimizing risk.

**Minimizes Cost of Capital:** It provides for planning the long term debt capital of the company strategically and thus reducing the cost of capital.

**Optimum Utilization of Funds:** A well planned, strategically designed and systematically arranged capital structure assists the companies in generating maximum output from the available funds.

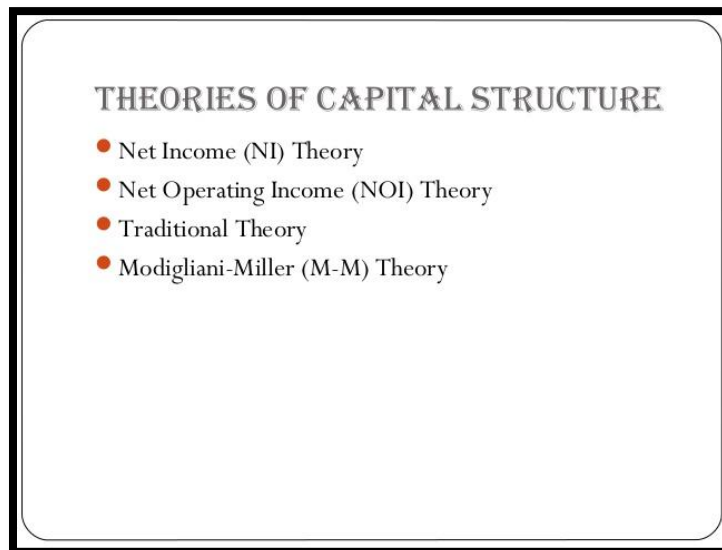
### Features of the Good Capital Structure:

**Profitability:** it should ensure most profits are earned. It should offer the least cost of financing with maximum returns

**Solvency:** the structure should not lead the company to a point it risks being insolvent. Too much debt threatens a company's solvency so any debt taken should be manageable

**Flexibility:** should things change the capital structure should be one that can be easily maneuvered to meet new market demands

### Theories of Capital Structure





## **Net Income (NI) Approach:**

This approach is based upon the following assumptions:

- There are no corporate taxes.
- The cost of debt is less than the cost of equity i.e. the capitalization rate of debt is less than the rate of equity capitalization. This prompts the firm to borrow.
- The debt capitalization rate and the equity capitalization rate remain constant.
- The proportion of the debt does not affect the risk perception of the investors. Investors are only concerned with their desired return.
- The cost of debt remains constant at any level of debt.
- Dividend Payout ratio is 100%.

The total market value of a firm on the basis of Net Income Approach is  $V = S + D$

Where,  $V$  = Total market value of a firm

$S$  = Market value of equity shares

= Earnings Available to Equity Shareholders ( $E$ )  $\div$  Equity Capitalisation Rate ( $K_e$ )

$D$  = Market value of debt,

= Total Interest payment on Debenture ( $I_d$ )  $\div$  Cost of Debt Capital ( $K_d$ )

Overall Cost of Capital or Weighted Average Cost of Capital can be calculated as:

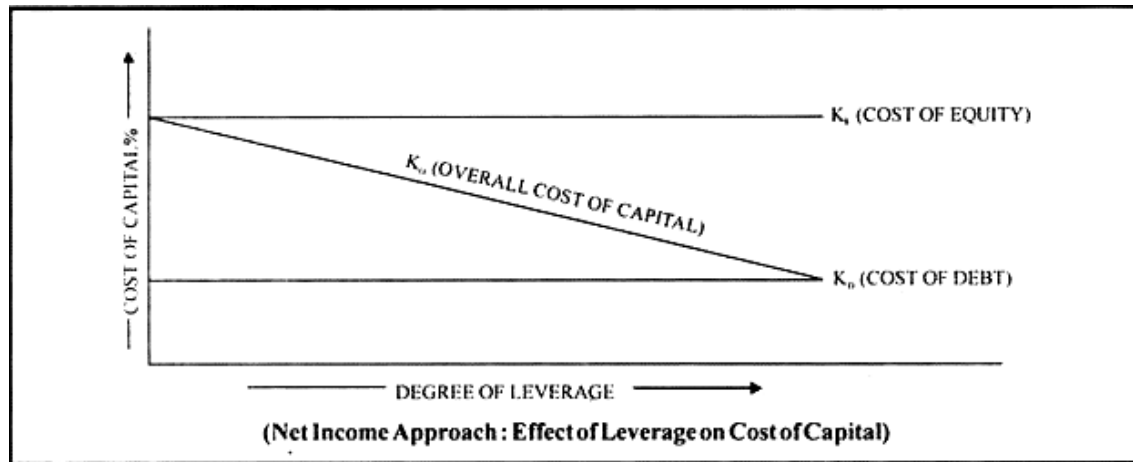
$K_0 = EBIT \div V$

$K_0 = W_1 \times K_d + W_2 \times K_e$

$W_1$  = Proportionate Market value of the Debt Capital in The Total value of the Firm (i.e)  
Relevant Weight of the Debt Capital

$W_2$  = Proportionate Market value of the Equity Capital in The Total value of the Firm (i.e)

## Relevant Weight of the Equity Capital



$$K_0 = \frac{D}{V} \times K_d + \frac{S}{V} \times K_e$$

Where,

D= Total market Value of Debt Capital

S = Total Market Value of Equity Share Capital

V = D + S

V = Total market Value of Debt Capital + Total Market Value of Equity Share Capital

### Example 1:

X Ltd. is expecting an annual EBIT of Rs. 1 Lakh. The company has Rs. 4 Lakhs in 10% debentures. The cost of equity capital or Capitalisation rate is 12.5%.

Ans:

<b>Calculation of the Value of the Firm</b>	
Net Income (EBIT)	1,00,000
Less : Interest on 10% Debentures of ₹ 4,00,000	<u>40,000</u>
Earnings available to equity shareholders	60,000
Market Capitalisation Rate	12.5%
Market Value of Equity (S) = $60,000 \times \frac{100}{12.5}$	4,80,000
Market Value of Debentures (D)	<u>4,00,000</u>
Value of the Firm (S + D)	<u>8,80,000</u>

Example 2:

A company expects a net income of Rs. 80,000. It has Rs. 2,00,000, 8% Debentures. The equity Capitalisation rate of the company is 10%. Calculate the value of the firm and overall Capitalisation rate according to the Net Income Approach (Without Tax Rate )

Ans:

<b>(a) Calculation of the Value of the Firm</b>	
Net Income	₹ 80,000
Less : Interest on 8% Debentures of ₹ 2,00,000	<u>16,000</u>
Earnings available to equity shareholders	<u>64,000</u>
Equity Capitalisation Rate	10%
Market Value of equity (S) = $64,000 \times \frac{100}{10}$	6,40,000
Market Value of Debentures (D)	<u>2,00,000</u>
Value of the Firm (S + D)	<u>8,40,000</u>
<b>Calculation of Overall Capitalisation Rate</b>	
$\text{Overall Cost of Capital (k}_o\text{)} = \frac{\text{Earnings}}{\text{Value of the firm}} \left( \frac{\text{EBIT}}{\text{V}} \right)$ $= \frac{80,000}{8,40,000} \times 100 = 9.52\%$	

If In The Above Example 2: The Debenture Debt Is Increased To Rs. 3,00,000, What Will Be the Value of The Firm And The Overall Capitalisation Rate. (Without Tax Rate )

Ans:

<b>Calculation of Value of the Firm if Debenture Debt is Raised to ₹ 3,00,000</b>	
Net Income	₹ 80,000
Less : Interest on 8% Debentures of ₹3,00,000	<u>24,000</u>
Earnings available to equity shareholders	<u>56,000</u>
Equity Capitalisation Rate 10%	10%
Market Value of Equity = $56,000 \times \frac{100}{10}$	5,60,000
Market Value of Debentures	<u>3,00,000</u>
Value of the Firm	<u>8,60,000</u>
$\text{Overall Capitalisation Rate} = \frac{80,000}{8,60,000} \times 100 = 9.30\%$	

## Net Operating Income Approach:

The NOI approach is based on following assumptions:

- There are no corporate taxes.
- Cost of debt remains constant at all level of debt.
- Overall cost of capital remains constant.
- Value of the firm depends on expected net operating income and overall capitalization rate or the opportunity cost of capital.
- Net operating income of the firm is not affected by the degree of financial leverage.
- The operating risk or business risk does not change with the change in debt equity mix.
- WACC does not change with the change in financial leverage.

$$V = \text{EBIT} \div K_0$$

Where, V = Value of a firm

EBIT = Net operating income or Earnings before interest and tax

$K_0$  = Overall cost of capital

The Market Value of Equity, According To This Approach Is The Residual Value Which Is Determined By Subtracting The Market Value of Debentures From The Total Market Value of The Firm.

$$S = V - D$$

Where, S = Market value of equity shares

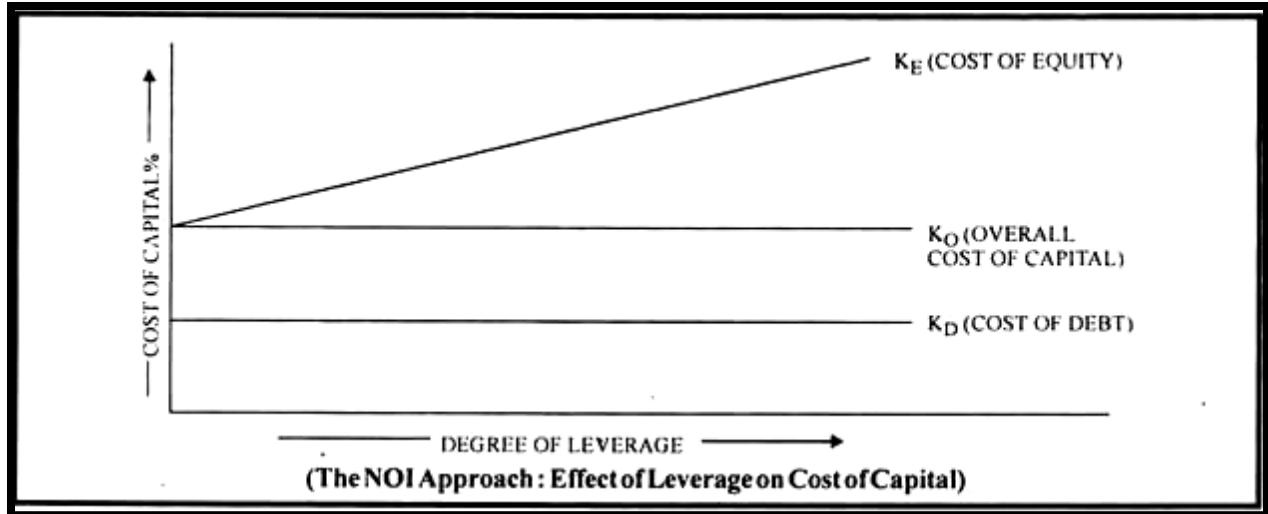
V = Total market value of a firm

D = Market value of debt

The cost of equity or equity capitalisation rate can be calculated as below:

$$\text{Cost of Equity or Equity Capitalisation Rate } (K_e) = \frac{\text{Earnings after Interest and Before Tax}}{\text{Market Value of Firm} - \text{Market Value Debt}}$$

$$K_e = \frac{\text{EBIT} - I}{V - D}$$



$$K_e = K_0 + (K_0 - K_d) \left( \frac{D}{S} \right)$$

Example: 1

P Ltd Has Operating Profit of Rs.100000. Its Overall Cost of Capital 10%. Cost of Debt capital is 6%. The Company has Employed Debt Capital Rs. 500000.

1. Calculate the Value of Equity Capital And Cost of Equity Capital Under NOI Approach.
2. What Will Be Implication Increase of Debt Capital firm Rs.500000 to Rs.700000.

Ans:

1. Calculation of the Value of Equity Capital And Cost of Equity Capital Under NOI Approach

$$V = D + S$$

$$S = V - D$$

D= Total market Value of Debt Capital

S = Total Market Value of Equity Share Capital

V = Total market Value of Debt Capital + Total Market Value of Equity Share Capital

Value of the Firm ( V )= EBIT ÷ K<sub>0</sub>

$$V = \text{Rs.}100000 \div 0.10$$

$$V = \text{Rs. } 1000000.$$

Value of the Debt capital (D) =  $I_d \div K_d$

$I_d = (\text{Rs.}500000 \times 6\%)$

$$D = \frac{\text{Rs.}30000}{0.06}$$

D = Rs.500000

Value of Equity Share Capital (S) = V-D

S = Rs.1000000- Rs.500000

S= Rs.500000.

Cost of Equity Capital ( $K_e$ ) =  $\frac{EBIT-I}{V-D}$

$$K_e = \frac{100000-30000}{500000} \times 100$$

$K_e = 14\%$

Or, Cost of Equity Capital Can be Calculated As:

$$K_e = K_0 + (K_0 - K_d) \left( \frac{D}{S} \right)$$

$$\text{Or, } K_e = 0.10 + (0.10 - 0.06) \left( \frac{500000}{500000} \right)$$

$$\text{Or, } K_e = 0.10 + 0.04$$

Or,  $K_e = 14\%$ .

2. Calculation of the Value of Equity Capital And Cost of Equity Capital When Increase of Debt Capital firm Rs.500000 to Rs.700000

Ans:

Value of Equity Share Capital (S) = V-D

S = Rs.1000000- Rs.700000

S= Rs.300000.

Value of the Debt capital (D) =  $I_d \div K_d$

$$I_d = (\text{Rs.}5=700000 \times 6\%)$$

$$D = \frac{\text{Rs.}42000}{0.06}$$

$$D = \text{Rs.}700000$$

Cost of Equity Capital ( $K_e$ ) =  $\frac{EBIT-I}{V-D}$

$$K_e = \frac{100000-42000}{300000} \times 100$$

$$K_e = 19.33\%$$

Example 2:

Company X And Company Y Are in the Same Risk Class And Identical In All Respect Except that company X Uses Debts While Company Y Does not Uses debt Capital. Levered Company Has Rs.900000 Debt Capital, carrying 10% of Interest. Both the Company's EBIT Rs. 300000. Tax Rate is 50% And Capitalisation Rate is 15% for All Equity Company.

1. Calculation Value of Both the Companies Using NI Approach.
2. Calculation Value of Both the Companies Using NOI Approach.
3. Using NOI Approach, Calculate the Overall cost of Capital for Both the Companies.



Ans:

**Calculation Value of Both the Companies Using NI Approach:**

<u>Particulars</u>	<u>Company X</u> <u>(Rs)</u>	<u>Company Y</u> <u>(Rs)</u>
Earning Before Interest And Tax (EBIT)	300000	300000
Less: Interest ( Rs.900000 X 10%)	(90000)	Nil
Earning Before Tax (EBT)	210000	300000
Less: Tax @50%	(105000)	(150000)
Earnings After Tax (EAT)	105000	150000
Equity Capitalisation Rate ( $K_e$ )	0.15	0.15
Value of Equity ( S ) = ( EAT $\div$ $K_e$ )	700000	1000000
Value of Debt ( D ) = ( $I_d \div K_d$ )	900000	Nil
Value of the Firm ( V ) = S + D	1600000	1000000

**Calculation Value of Both the Companies Using NOI Approach**

<u>Particulars</u>	<u>Company X</u> <u>(Rs)</u>	<u>Company Y</u> <u>(Rs)</u>
Earnings Before Interest And Tax (EBIT)	300000	300000
Equity Capitalisation rate ( $K_e$ )	0.15	0.15
Tax rate	0.50	0.50
Vale of the Firm ( $V$ ) = $\frac{EBIT (1-t)}{K}$	1000000	1000000
Value of Debt ( $D$ ) = ( $I_d \div K_d$ ) ( $1-t$ )	450000	Nil
Value of Equity ( $S$ ) = $V - D$	550000	100000
Add: Value of Debt ( $D$ ) = ( $I_d \div K_d$ ) before Tax Rate	900000	Nil
Vale of the Firm ( $V$ ) = $S + D$	1450000	100000

**Calculate the Overall cost of Capital for Both the Companies by Using NOI Approach:**

**For Company X**

$$\begin{aligned}\text{Cost of Debt Capital ( } K_d \text{)} &= 0.10 \times (1-t) \\ &= 0.10 \times (1 - 0.50) \\ &= 0.05\end{aligned}$$

$$\text{Cost of Equity capital ( } K_e \text{)} = \frac{(EBIT-I)(1-t)}{S}$$

$$K_e = \frac{105000}{550000}$$

$$K_e = 19.09\%$$

Overall Cost of capital ( $K_0$ )

$$K_0 = \frac{D}{V} \times K_d + \frac{S}{V} \times K_e$$

$$K_0 \text{ (After Tax rate )} = \frac{900000}{1450000} \times 0.05 + \frac{550000}{1450000} \times 19.09$$

$$K_0 = 10.34\%$$

**For Company Y**

Overall Cost of capital ( $K_0$ ) = Cost of Equity capital ( $K_e$ )

$$K_0 = 15\%.$$