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Capital Structure

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Coverage –

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- **Capital Structure planning**
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- **Factors affecting Capital structure**
- **Concept of Value of a Firm**
- **Significance of Overall Cost of Capital (WACC)**
- **Capital Structure theories –**
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  - **Net Operating Income**
  - **Modigliani-Miller**
  - **Traditional Approach**

Concept of Capital Structure

- Capital Structure is one of the basic financial decisions directed towards the achievement of maximization of shareholders' wealth.
- It refers to the make up of the capitalization long term capital of the firm.
- It is the proportion existing between various sources of long term capital such as equity capital, preference capital and debenture raised by firm.
- Capital structure can be defined as the mix of owned capital (equity, reserves & surplus) and borrowed capital (debentures, loans from banks or financial institutions)

Concept of Capital Structure

- Maximization of shareholders' wealth is prime objective of a financial manager. The same may be achieved if an optimal capital structure is designed for the company.
- It involves balancing the shareholders' expectations (risk & returns) and capital requirements of the firm.

Planning the Capital Structure

Important Considerations –

- **Return**: Means ability to generate maximum returns to the shareholders, i.e. maximize EPS and market price per share.
- **Cost:** minimizes the cost of capital (WACC). Debt is cheaper than equity due to tax shield on interest & no benefit on dividends.
- **Risk:** insolvency risk associated with high debt component.
- **Flexible:** altering capital structure without much costs & delays, to raise funds whenever required.
- **Capacity:** ability to generate profits to pay interest and principal.

Sources of Financing Capital

Long-Term Sources:

- **Equity Shares**
- **Preference shares**
- **Debentures**
- **Long term loans**

Short term sources:

- **Short term loans**
- **Bank Overdrafts**

Concept of Value of a Firm

- Value of a firm depends upon (EBIT) earnings of a firm and its cost of capital (Ko) (i.e. WACC).
- Earnings are a function of investment decisions, and operating efficiencies, & WACC is a function of its capital structure.
- Thus, value of a firm varies due to changes in the earnings of a company or its cost of capital, or both.
- Capital structure cannot affect the total earnings of a firm (EBIT), but it can affect the shareholders' earnings.

Patterns of capital structure

- Equity Shares only
- Equity Shares and Preference Shares
- Equity Shares and Debentures
- Equity, Preference Shares and Debentures etc.

Capital Structure Theories

ASSUMPTIONS –

- Firms use only two sources of funds – equity & debt.
- No change in investment decisions of the firm, i.e. no change in total assets.
- 100 % dividend payout ratio, i.e. no retained earnings.
- Business risk of firm is not affected by the financing mix.
- No corporate or personal taxation.
- Investors expect future profitability of the firm.

Capital Structure Theories – A) Net Income Approach (NI)

- Net Income approach proposes that there is a definite relationship between capital structure and value of the firm.
- The capital structure of a firm influences its cost of capital (WACC), and thus directly affects the value of the firm.
- NI approach assumptions –
  - ***NI approach assumes that a continuous increase in debt does not affect the risk perception of investors.***
  - ***Cost of debt (K_d) is less than cost of equity (K_e) [i.e. $K_d < K_e$]***
  - ***Corporate income taxes do not exist.***

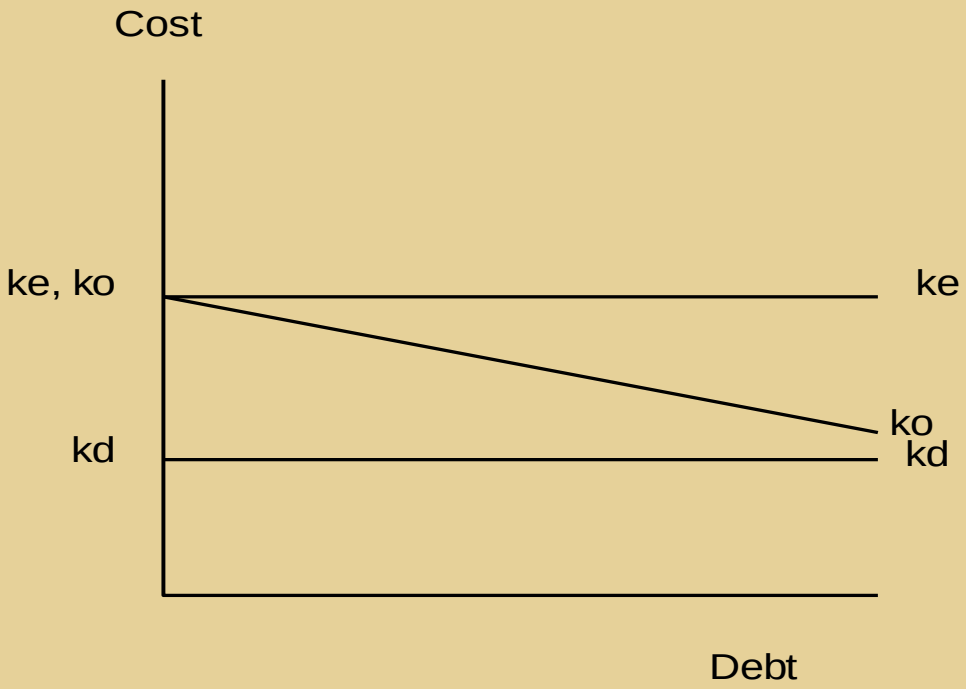
Capital Structure Theories – A) Net Income Approach (NI)

- As per NI approach, higher use of debt capital will result in reduction of WACC. As a consequence, value of firm will be increased.

  $$\text{Value of firm} = \frac{\text{Earnings}}{\text{WACC}}$$

- Earnings (EBIT) being constant and WACC is reduced, the value of a firm will always increase.
- Thus, as per NI approach, a firm will have maximum value at a point where WACC is minimum, i.e. when the firm is almost debt-financed.

Capital Structure Theories – A) Net Income Approach (NI)



As the proportion of debt (K_d) in capital structure increases, the WACC (K_o) reduces.

Capital Structure Theories – A) Net Income Approach (NI)

Calculate the value of Firm and WACC for the following capital structures			
EBIT of a firm Rs. 200,000.	Ke = 10%	Kd = 6%	
Debt capital Rs. 500,000	Debt = Rs. 700,000	Debt = Rs. 200,000	

Particulars	case 1		case 2		case 3
EBIT	200,000		200,000		200,000
(-) Interest	30,000		42,000		12,000
EBT	170,000		158,000		188,000
Ke	10%		10%		10%
Value of Equity	1,700,000		1,580,000		1,880,000
(EBT / Ke)					
Value of Debt	500,000		700,000		200,000
Total Value of Firm	2,200,000		2,280,000		2,080,000
WACC	9.09%		8.77%		9.62%
(EBIT / Value) * 100					

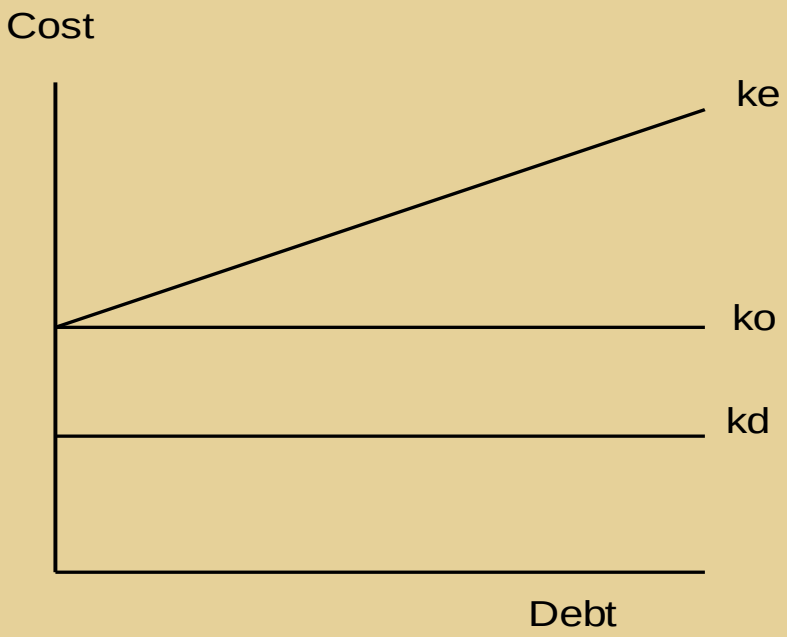
Capital Structure Theories – B) Net Operating Income (NOI)

- Net Operating Income (NOI) approach is the exact opposite of the Net Income (NI) approach.
- As per NOI approach, value of a firm is not dependent upon its capital structure.
- Assumptions –
  - ***WACC is always constant, and it depends on the business risk.***
  - ***Value of the firm is calculated using the overall cost of capital i.e. the WACC only.***
  - ***The cost of debt (K_d) is constant.***
  - ***Corporate income taxes do not exist.***

Capital Structure Theories – B) Net Operating Income (NOI)

- NOI propositions (i.e. school of thought) –
  - The use of higher debt component (borrowing) in the capital structure increases the risk of shareholders.
  - Increase in shareholders' risk causes the equity capitalization rate to increase, i.e. higher cost of equity (K_e)
  - A higher cost of equity (K_e) nullifies the advantages gained due to cheaper cost of debt (K_d)
  - In other words, the finance mix is irrelevant and does not affect the value of the firm.

Capital Structure Theories – B) Net Operating Income (NOI)



- Cost of capital (K_o) is constant.
- As the proportion of debt increases, (K_e) increases.
- No effect on total cost of capital **(WACC)**

Capital Structure Theories – B) Net Operating Income (NOI)

Calculate the value of firm and cost of equity for the following capital structure -				
EBIT = Rs. 200,000.	WACC (Ko) = 10%	Kd = 6%		
Debt = Rs. 300,000, Rs. 400,000, Rs. 500,000		(under 3 options)		

Particulars	**Option I**		**Option II**		**Option III**
EBIT	200,000		200,000		200,000
WACC (Ko)	10%		10%		10%
Value of the firm	2,000,000		2,000,000		2,000,000
Value of Debt @ 6 %	300,000		400,000		500,000
Value of Equity (bal. fig)	1,700,000		1,600,000		1,500,000
Interest @ 6 %	18,000		24,000		30,000
EBT (EBIT - interest)	182,000		176,000		170,000
Hence, Cost of Equity (Ke)	10.71%		11.00%		11.33%

Capital Structure Theories – C) Modigliani – Miller Model (MM)

- MM approach supports the NOI approach, i.e. the capital structure (debt-equity mix) has no effect on value of a firm.
- Further, the MM model adds a behavioural justification in favour of the NOI approach (personal leverage)
- Assumptions –
  - ***Capital markets are perfect and investors are free to buy, sell, & switch between securities. Securities are infinitely divisible.***
  - ***Investors can borrow without restrictions at par with the firms.***
  - ***Investors are rational & informed of risk-return of all securities***
  - ***No corporate income tax, and no transaction costs.***
  - ***100 % dividend payout ratio, i.e. no profits retention***

Capital Structure Theories – C) Modigliani – Miller Model (MM)

MM Model proposition –

- Value of a firm is independent of the capital structure.
- Value of firm is equal to the capitalized value of operating income (i.e. **EBIT**) by the appropriate rate (i.e. **WACC**).
- Value of Firm = **Mkt. Value of Equity + Mkt. Value of Debt**

$$= \frac{\text{Expected EBIT}}{\text{Expected WACC}}$$

Capital Structure Theories – C) Modigliani – Miller Model (MM)

MM Model proposition –

- As per MM, identical firms (except capital structure) will have the same level of earnings.
- As per MM approach, if market values of identical firms are different, '***arbitrage process***' will take place.
- In this process, investors will switch their securities between identical firms (from levered firms to un-levered firms) and receive the same returns from both firms.

Capital Structure Theories – C) Modigliani – Miller Model (MM)

Levered Firm

- Value of levered firm = Rs. 110,000
- Equity Rs. 60,000 + Debt Rs. 50,000
- K_d = 6 % , EBIT = Rs. 10,000,
- Investor holds 10 % share capital

Un-Levered Firm

- Value of un-levered firm = Rs. 100,000 (all equity)
- EBIT = Rs. 10,000 and investor holds 10 % share capital

Capital Structure Theories – C) Modigliani – Miller Model (MM)

Return from Levered Firm:

$$Investment = 10\%\left(110,000 - 50,000\right) = 10\%\left(60,000\right) = 6,000$$

$$Return = 10\%\left[10,000 - \left(6\% \times 50,000\right)\right] = 1,000 - 300 = 700$$

Alternate Strategy:

1. Sell shares in L: $10\% \times 60,000 = 6,000$
2. Borrow (personal leverage): $10\% \times 50,000 = 5,000$
3. Buy shares in U: $10\% \times 100,000 = 10,000$

Return from Alternate Strategy:

$$Investment = 10,000$$

$$Return = 10\% \times 10,000 = 1,000$$

Less: Interest on personal borrowing $= 6\% \times 5,000 = 300$

Net return $= 1,000 - 300 = 700$

Cash available $= 11,000 - 10,000 = 1,000$

Capital Structure Theories – D) Traditional Approach

- The NI approach and NOI approach hold extreme views on the relationship between capital structure, cost of capital and the value of a firm.
- Traditional approach (*'intermediate approach'*) is a compromise between these two extreme approaches.
- Traditional approach confirms the existence of an optimal capital structure; where WACC is minimum and value is the firm is maximum.
- As per this approach, a best possible mix of debt and equity will maximize the value of the firm.

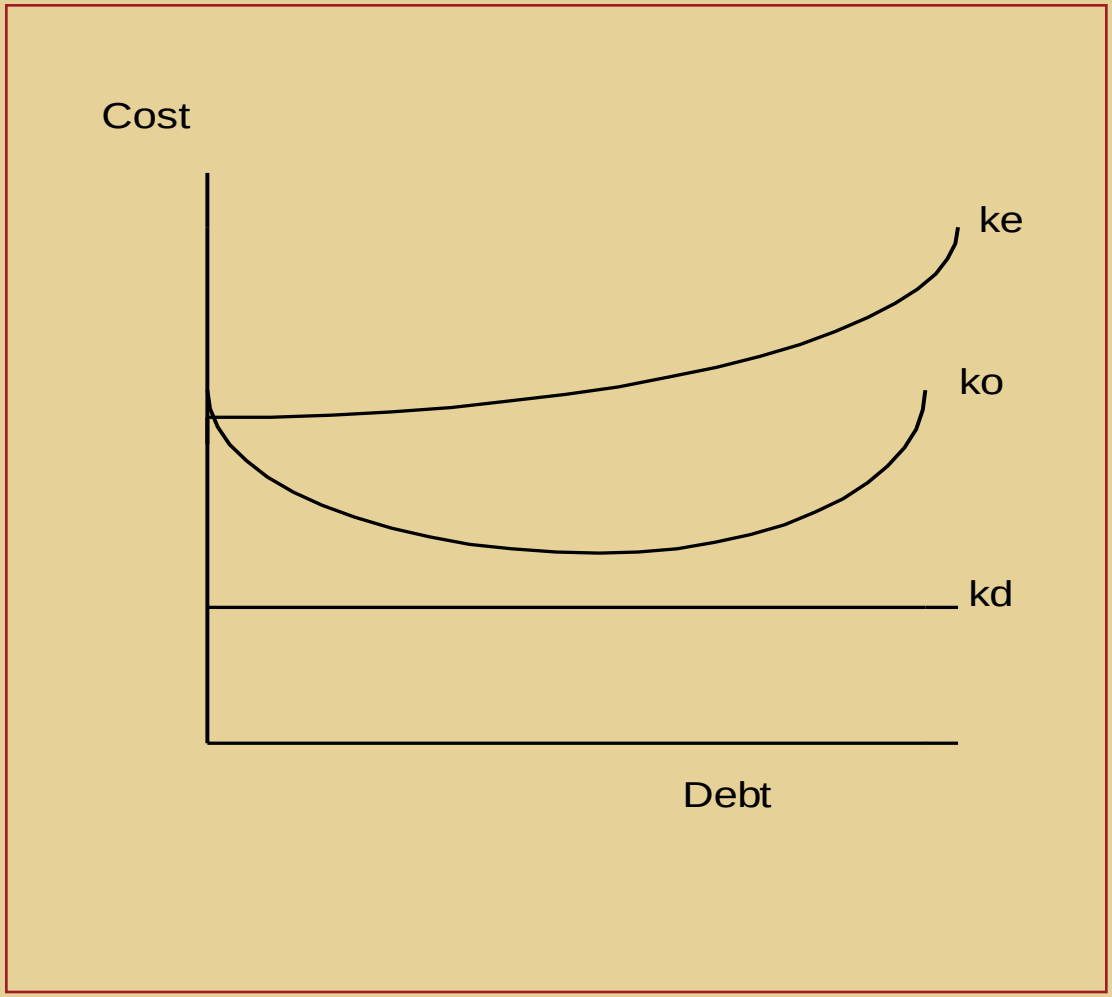
Capital Structure Theories – D) Traditional Approach

The approach works in 3 stages –

1) Value of the firm increases with an increase in borrowings (since $K_d < K_e$). As a result, the WACC reduces gradually. This phenomenon is up to a certain point.
2) At the end of this phenomenon, reduction in WACC ceases and it tends to stabilize. Further increase in borrowings will not affect WACC and the value of firm will also stagnate.
3) Increase in debt beyond this point increases shareholders' risk (*financial risk*) and hence K_e increases. K_d also rises due to higher debt, WACC increases & value of firm decreases.

Capital Structure Theories – D) Traditional Approach

- Cost of capital (K_o) is reduces initially.
- At a point, it settles
- But after this point, (K_o) increases, due to increase in the cost of equity. (K_e)



Capital Structure Theories – D) Traditional Approach

EBIT = Rs. 150,000, presently 100% equity finance with Ke = 16%. Introduction of debt to the extent of Rs. 300,000 @ 10% interest rate or Rs. 500,000 @ 12%.

For case I, Ke = 17% and for case II, Ke = 20%. **Find the value of firm and the WACC**

Particulars	**Presently**		**case I**		**case II**
Debt component	-		300,000		500,000
Rate of interest	0%		10%		12%
EBIT	150,000		150,000		150,000
(-) Interest	-		30,000		60,000
EBT	150,000		120,000		90,000
Cost of equity (Ke)	16%		17%		20%
Value of Equity (EBT / Ke)	937,500		705,882		450,000
Total Value of Firm (Db + Eq)	937,500		1,005,882		950,000
WACC (EBIT / Value) * 100	16.00%		14.91%		15.79%