
UNIT 3 CAPITAL STRUCTURE DECISIONS

Objectives

The objectives of this unit are to:

- define and distinguish capital structure
- explain briefly the important Characteristics of various long term sources of funds.
- dilate upon the criteria for determining pattern of capital structure.
- analyse EBIT-EPS and ROI-ROE relationship.
- examine critically theories of capital structure-decision
- identify the factors influencing capital structure decision
- evaluate the relevance of debt equity ratio in public enterprises.

Structure

- 3.1 Introduction
- 3.2 Conceptual Framework
- 3.3 Characteristics of Important long term sources of Funds
- 3.4 Criteria for determining pattern of Capital Structure
- 3.5 Risk and Capital Structure
 - 3.5.1 EBIT – EPS Analysis
 - 3.5.2 ROI – ROE Analysis
- 3.6 Theories of Capital Structure Decision
 - 3.6.1 Net Income Approach
 - 3.6.2 Net Operating Income Approach
 - 3.6.3 M-M Approach
 - 3.6.4 Traditional Approach
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- 3.8 Relevance of Debt-equity ratio in Public enterprises
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3.1 INTRODUCTION

Planning the capital structure is one of the most complex areas of financial decision making because of the inter-relationships among components of the capital structure and also its relationship to risk, return and value of the firm. For a student of finance, the term capital usually denotes the long-term funds of the firm. Debt capital and ownership capital are the two basic components of capital. Equity capital, as one of the components of capitalization, comprises equity share capital and retained earnings. Preference share capital is another distinguishing component of total capital. In this unit, characteristics of important long-term sources of funds, EBIT-EPS analysis, ROI-ROE analysis, factors influencing capital structure, theories of capital structure decision, etc are narrated briefly. In the end, relevance of debt-equity ratio in public enterprises is also discussed.

3.2 CONCEPTUAL FRAMEWORK

According to Gerstenberg, “ capital structure refers to the make up of a firm’s capitalization”. In other words, it represents the mix of different sources of long-term funds. E.F. Brigham defines the term as the percentage share of each type of capital used by the firm-Debt, preference share capital and equity capital (equity share capital paid up plus retained earnings). According to E.W.Walker, concept of capital structure includes the following:

- The proportion of long-term loans;
- The proportion of equity capital and
- The proportion of short-term obligations
- In general, the experts in finance define the term capital structure to include only long-term debt and total Stockholders’ investment.

Financial structure means the composition of the entire left hand side (liabilities side) of the balance sheet. Financial structure refers to all the financial resources marshelled by the firm. It will include all forms of long as well as short-term debts and equity.

Thus, practically speaking, there is no difference between the capital structure (as defined by walker) and financial structure.

In brief,

Capital structure = proportions of all types of Long-Term capital

Financial structure = Proportions of all types of Long-Term and Short-Term capital

Capitalisation = Total Long-Term capital

3.3 CHARACTERISTICS OF IMPORTANT LONG-TERM SOURCES OF FUNDS

The four major sources of Long-Term funds in a firm are equity(or ordinary) shares preference shares, retained earnings and long term debt. Many financial analysts and managers tend to think of preference shares as a substitute of debt, as the amount of dividend to be paid is fixed. The difference is that the preference dividend, unlike debt interest, is not a tax- deductible expense. It does not have a fixed maturity date. Preference shareholders have a prior claim to receive income from the firm’s earning through dividends. Convertible debentures have the features of both debt and equity capital.

The main focus in the discussion that follows is on deciding the mix of debt and equity which a firm should employ in order to maximize shareholder wealth. Because of the secondary position relative to debt, suppliers of equity capital take greater risk and therefore, must be compensated with higher expected returns. The distinguishing characteristics of debt, preference share capital, equity share capital and Retained Earnings are summarized in Table 3.1.

3.4 CRITERIA FOR DETERMINING PATTERN OF CAPITAL STRUCTURE

While choosing a suitable pattern of capital structure for the firm, finance manager should keep into consideration certain fundamental principles. These principles are militant to each other. A prudent finance manager strikes golden mean among them by giving proper weightage to them.

Table 3.1: Characteristics of Long-Term Sources of Funds

Debt	Preference Share Capitals	Equity share capital	Retained Earnings
1. Firm must pay back money with interest.	1. Preference dividends are limited in amount to rate specified in the agreement.	1. Money is raised by selling ownership rights.	1. Lower amount of money for current dividends but can increase future dividends.
2. Interest rate is based on risk of Principal and interest payments as perceived by lenders	2. Dividends are not legally required to be paid. But dividend on equity shares can not be paid unless preference shareholders are paid dividend. Now payment of dividend to preference shareholders for a number of years gives them the voting rights.	2. Value of the share is determined by investors.	2. Shareholders forgo dividend income but they do not lose ownership rights, if new equity shares are issued.
3. Amount of money to be repaid is specified by debt contract.	3. No maturity but usually callable	3. Dividends are not contractually payable. No maturity.	3. Funds are internal No need for external involvement.
4. Lenders can take action to get their money back	4. Usually no voting rights except as per (2) above.	4. Voting rights can create change in ownership.	4. Cost of issuing securities is avoided.
5. Lenders get preferred treatment in liquidation	5. Preference share-holders come next, when lenders are paid in liquidation.	5. Equity shareholders get the residual assets prorata after lenders & preference shareholders claims are met in liquidation.	5. It is related to dividend policy decisions.
6. Interest payments are tax-deductable	6. preference Dividends are not tax-deductable.	6. Equity dividends are not tax-deductable,	

3.4.1 Cost Principle:

According to this principle, ideal pattern of capital structure is one that tends to minimize cost of financing and maximize the value per share. Cost of capital is subject to interest rate at which payments have to be made to suppliers of funds and tax status of such payments. Debt capital is cheaper than equity capital from both the points of view. According to this, the use of debt capital in the financing process is immensely helpful in raising income of the company.

3.4.2 Risk Principle:

This principle suggests that such a pattern of capital structure should be

designed so that the firm does not run the risk of bringing on a receivership with all its difficulties and losses. Risk principle places relatively greater reliance on common stock for financing capital requirements of the corporation and forbids as far as possible the use of fixed income bearing securities.

3.4.3 Control Principle:

While designing sound capital structure for the firm and for that matter choosing different types of securities, finance manager should also keep in mind that controlling position of residual owners remains undisturbed. The use of preferred stock as also bonds offers a means of raising capital without jeopardizing control. Management desiring to retain control must raise funds through bonds and preference capital.

3.4.4 Flexibility Principle:

According to flexibility principle, the management should strive for such combinations of securities that enable it to maneuver sources of funds in response to major changes in need for funds. Not only several alternatives are open for assembling required funds but also bargaining position of the corporation is strengthened while dealing with the suppliers of funds (through bonds).

3.4.5 Timing Principle:

Timing is always important in financing more particularly in a growing concern. Maneuverability principle is sought to be adhered in choosing the types of funds so as to enable the company to seize market opportunities and minimize cost of raising capital and obtain substantial savings. Important point that is to be kept in mind is to make the public offering of such securities as are greatly in demand. Depending on business cycles, demand of different types of securities oscillates. Equity share during boom is always welcome.

Activity 1

- 1) What is capital structure? How is it different from financial structure?

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- 2) Bring out in brief, characteristics of equity share capital

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- 3) List out sources of long – term finance used by a company of India origin.

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- 4) Discuss the criteria for determining pattern of capital structure.

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3.5 RISK AND CAPITAL STRUCTURE:

A firm's capital structure should be developed keeping in view risk focus because the risk affects the value of the firm. Risk can be considered in two ways:

- a) The capital structure should be consistent with the business risk of the firm, and
- b) The capital structure results in a certain level of financial risk to the firm.

Business risk is the relationship between the firm's sales and its earnings before interest and taxes (EBIT). In general, the greater the firm's operating leverage i.e. the use of fixed operating costs-the higher is the business risk. In addition to operating leverage, revenue stability and cost stability also affect the business risk of the firm. The revenue stability means the variability of the firm's sales revenues which depends on the demand and the price of the firm's products. Cost stability refers to the relative predictability of input prices such as labour and material. The more predictable these prices are the less is the business risk. Business risk varies among firms. Whatever their lines of business, the business risk is not affected by capital structure decisions. In fact, capital structure decisions are influenced by the business risk. Firms with high business risks, tend to have less fixed operating costs. Let us take an example to illustrate the implications of business risk for capital structure decisions.

Example

Raj Cosmetics Ltd., engaged in the process of planning its capital structure, has obtained estimates of sales and associated levels of EBIT. The sales forecasting group feels that there is a 25 percent chance that sales will be Rs. 4,00,000 a 50 percent chance that sales will be Rs. 6,00,000 and 25 percent the sales will total Rs. 8,00,000. These data are summarised Table 3.2.

Table 3.2: Estimated sales and Associated levels of EBIT

	(000)		
Probability of Sales	0.25	0.50	0.25
Sales	400	600	800
-Variable operating costs (50% of Sales)	200	300	400
-Fixed Operating Costs	200	200	200
Earnings before interest and taxes (EBIT)	<u>0</u>	<u>100</u>	<u>200</u>

The EBIT data, i.e. Rs.0,100 or 200 thousands at probability levels of 25%, 50% and 25% respectively reflect the business risk of the firm and has to be taken into consideration when designing a capital structure.

The firm's capital structure affects the firm's financial risk arising out of the firm's use of financial leverage which is reflected in the relationship between EBIT and EPS. The more fixed cost financing, i.e. debt and preference capital in the firm's capital structure, the greater is the financial risk. Suppliers of funds will raise the cost of funds if the financial risk increases. Let us take an example to illustrate this point.

Raj Cosmetics Let. Is now considering seven – alternative capital structure. Stated in terms of debt ratio) i.e. Percentage of debt in the total capital) these are 0,10,20,30,40,50, and 60, per cent. Assume that (1) the firm has no current

liabilities, (2) that its capital structure currently contains all equity (25,000 equity shares are outstanding at Rs. 20 par value), and (3) the total amount of capital remains constant at Rs.5,00,000.

Table 3.3: Capital Structure Associated with Alternative Debt Ratios

Debt Ratio%	Total Assests (Rs.000)	Debt (Rs. 000)	Equity (Rs. 000) 4 = 2 - 3	Equity Shares outstanding (Numbers 000) 5 = (4 / 20)
1	2	3	4 = 2-3	5 = (4 / 20)
0	500	0	500	25.00
10	500	50	450	22.50
20	500	100	400	20.00
30	500	150	350	17.50

As debt increases, the interest rate also increase with the increase in financial leverage (i.e. debt ratios). Hence the total interest on all debt also increase (as successive debenture issues carry higher interest rates) as shown in Table 3.4.

Table 3.4: Interest amount at Various levels of Debt

Capital Structure % of Debt 1	Debt (Rs.000) (1)	Interest Rate on all debt % (2)	Interest amount (Rs.000) (3 = 1*2)
0	0	0.0	0.00
10	50	9.0	4.50
20	100	9.5	9.50
30	150	10.0	15.00
40	200	11.0	22.00
50	250	13.5	33.75
60	300	15.5	49.50

3.5.1 EBIT-EPS Analysis for Capital Structure

Using the levels of EBIT in table 3.2, number of equity shares in the columns 5 of table 3.3. and interest values calculated in table 3.4, the calculation of EPS for debt ratios of 0,30, and 60 percent respectively is shown in Table 3.5. the effective tax rate is assumed to be 40 percent.

Table 3.5: Calculation of EPS for alternative Debt ratio

Probability	0.25	0.50	0.25
When Debt ratio =			
Less Interest (Table 3.4)	0.00	100.00	200.00
Earnings after taxes	0.00	0.00	0.00
Less Taxes (0.40)	0.00	100.00	200.00
Earnings after taxes	0.00	40.00	80.00
EPS (25,000) shares (table 3.3)	0.00	60.00	120.00
	0.00	2.40	4.80
When Debt ratio = 30%			
EBIT	0.00	100.00	200.00
Less Interest	15.00	15.00	15.00
Earnings before taxes	(15.00)	85.00	185.00
Less Taxes (0.40)	(6.00)	34.00	74.00
Earnings after taxes	(9.00)	51.00	111.00
EPS (17,500 shares)	(0.51)	2.91	6.34

When Debt ratio = 60%			
EBIT	0.00	100.00	200.00
Less Interest	49.50	49.50	49.0
	—	—	—
Earnings before taxes	(49.50)	50.50	150.50
Less Taxes (0.40)	(19.80) (a)	20.20	60.20
	—	—	—
Earnings after taxes	(29.70)	30.30	90.30
EPS (10,000 Shares)	2.97	3.03	9.03

Notes: a) It is assumed that the firm received the tax benefits from its loss in the current period, as a result of carrying forward and setting off the loss against in the following periods.

Following the same procedure as in Table 3.5 we may obtain EPS for other debt ratios. Table 3.6 gives expected EPS at 50% probability level (to be viewed as typical level) for seven alternative debt ratios along with the Standard deviation and co-efficient of variation of expected EPS.

Table 3.6: Expected EPS, Standard. Deviation and Co-efficient of variation of EPS at 50% probability level for alternative debt ratios

Capital structure debt ratio (%)	Expected EPS (Rs.) (1)	Standard deviation of EPS (Rs.) (2)	Co-efficient of variation (2) + (1) = (3)
0	2.40	1.70	0.71
10	2.55	1.88	0.74
20	2.72	2.13	0.78
30	2.91	2.42	0.83
40	3.12	2.83	0.91
50	3.18	3.39	1.07
60	3.03	4.24	1.40

Notes: The standard deviation () represents the square root of the sum of the product of each deviation from the mean of expected value squared and the associated probability of occurrence of each outcome. This is the most common statistical measure of assets risk.

The co-efficient of variation is calculated by dividing the standard deviation for an asset by its mean or expected value. The higher the co-efficient of variation, the riskier is the asset.

Table 3.6 shows that as the firm's financial leverage increases, its co-efficient of variation of EPS also increases, signifying that the higher level of risk is associated with higher levels of financial leverage.

The relative risk of the two of the capital structures at debt ratio=0% and 60% respectively is illustrated in Figure 3.1 by showing the subjective probability distribution of

EPS associated with each of them. As the expected level of EPS increase with increasing financial leverage, the risk also increases which is reflected in the relative dispersion of each of the distributions. As the higher levels of financial EPS increase. There are chances that there will be negative EPS depending on the probabilities of occurrence of the expected results.

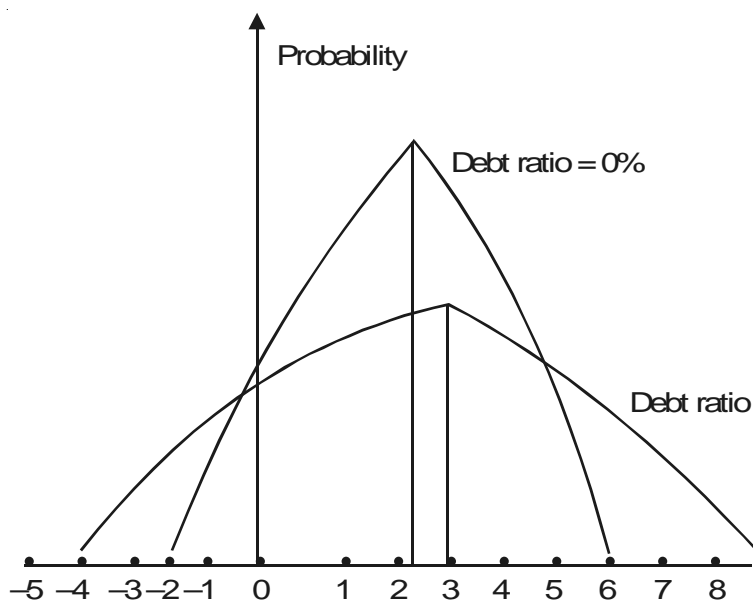
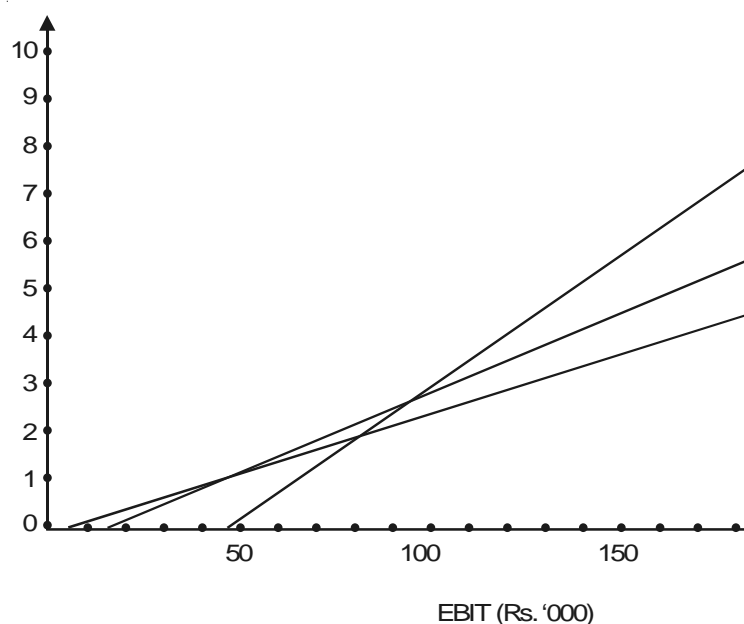


Figure 3.1: A Graphic Presentation of Probability Distribution of EPS at Alternative Debt Ratios.

The EBIT –EPS analysis helps in choosing the capital structure which maximizes EPS over the expected range of EBIT. Since EBIT is one of the major factors which affects the market value of the firm’s shares, EPS can as well be used to measure the effect of various capital structure on shareholders’ wealth. The relationship between EBIT and EPS of the firm to analyse the effect of capital structure on results to the shareholders has been graphically shown in Figure 3.2 where data from Table 3.7 are used.

Table 3.7 : EBIT-EPS Coordinates (Selected Capital Structures)

Capital structure debt ratio (%)	EBIT	
	Rs.1,00 000	Rs.2,00,000
	Earnings per share	
0	2.40	4.80
30	2.91	6.34
60	3.03	9.03



Figures 3.2: A Graphic comparison of selected structures for Raj Cosmetics Ltd.

Expected earnings before interest and taxes are assumed to be constant because only the effect of financing costs such as interest and preference dividends on equity shareholders' earnings is to be analysed. Thus, the business risk is assumed constant.

Graphically, the risk of each capital structure can be seen in the context of the financial break even point. (i.e. EBIT-axis intercept). Below the x-axis, negative EPS would result. The higher the financial break even point and the steeper the slope of the capital structure line, the greater the financial risk.

The assessment of the capital structure can also be made by using ratios. With increased financial leverage, the ability of the firm to service its debt decreases. Thus, the times Earned Interest Ratio (i.e. EBIT divided by interest) ratio also measures firm's financial leverage and associated risk.

3.5.2 ROI-ROE Analysis

In the preceding section, we looked at the relationship between EBIT and EPS. Pursuing a similar type of analysis, we may look at the relationship between the ROI and ROE for different levels of financial leverage.

Example:

Raj Ltd., which requires an investment outlay of Rs. 200 lakhs, is considering two capital structures propositions:

Capital Structure X
(Rs. in lakhs)

Equity 200
Debt 0

Capital Structure Y
(Rs. in lakhs)

Equity 100
Debt 100

Tax rate = 50 percent

Cost of Debt = 12 percent

Based on the above information, the relationship between ROI and ROE would be as shown in Table 3.8.

Table 3.8: Relationship between ROI and ROE under capital structures X and Y

Particulars	ROI	EBIT	Int.	Profit before tax	Profit after tax	Tax	Return on Equity
Capital Structure X	5%	10	0	10	5	5	2.5%
	10%	20	0	20	10	10	5.0%
	15%	30	0	30	15	15	7.5%
	20%	40	0	40	20	20	10.0%
	25%	50	0	50	25	25	12.5%
Capital Structure Y	5%	10	10	0	0	0	0.0%
	10%	20	10	10	5	5	5.0%
	15%	30	10	20	10	10	10.0%
	20%	40	10	30	15	15	15.0%
	25%	50	10	40	20	20	20.5%

Return on Equity is equity earnings divided by Net worth. Looking at the relationship between ROI and ROE, we find that

- (1) The ROI under capital structure X is higher than the ROE under capital structure Y (ROI is less than the cost of Debt).
- (2) The indifference value of ROI is equal to the cost of Debt.
- (3) The ROE under capital structure X (ROI is more than the cost of Debt).

Mathematically this relationship can be expressed as:

$$ROE = [ROI + (ROI-r) D/E] (1-t)$$

Where r = Cost of Debt

D/E = Debt- Equity Ratio

t = tax rate

Applying the above equation when D/E Ratio is 1, we may calculate the value of ROE for two values of ROI namely, 15 percent and 20 percent.

$$ROI = 15\% \quad ROE = [15+(15-10) 1]0.5 = 10 \%$$

$$ROI = 20\% \quad ROE = [20+(20-10) 1]0.5 = 15\%$$

The results are the same as we see in Table 3.8.

Activity 2

1. Leverage decision is the same as capital structure decision. Do you agree? Give one reason.

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2. Distinguish between EBIT and EPS.

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3. Collect the figures of any company and do the EBIT-EPS analysis by making necessary assumptions.

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4. With a real company example make ROI-ROE analysis.

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3.6 THEORIES OF CAPITAL STRUCTURE

A firm should try to maintain an optimum capital structure with a view to maintaining financial stability. The optimum capital structure is obtained when the market value per equity share is the maximum. In order to achieve the goal of identifying an optimum debt-equity mix, it is necessary for the finance manager to be familiar with the basic theories underlying the capital structure of corporate enterprises.

1. N I Approach
2. NOI Approach

3. MM Approach
4. Traditional Approach

Common assumptions of the theories of capital structure decision are as follows:

- (i) Preference share capital is merged with debt. The firm employs only debt and equity capital.
- (ii) There are no corporate taxes.
- (iii) EBIT is not expected to grow.
- (iv) The firm's total financing remains constant.
- (v) The business risk does not change with the growth of business firm.
- (vi) All investors have the same subjective probability distribution of the future expected earnings for a given firm.

3.6.1 Net Income (NI) Theory

According to this approach, capital structure decision is relevant to the valuation of the firm in as much as change in the pattern of capitalization brings about corresponding change in the overall cost of capital and total value of the firm. This theory, also known as fixed k_e theory, was propounded by David Durand.

The critical assumptions of this theory are

- (i) There are no corporate taxes.
- (ii) The debt content does not change risk perception of the investors.
- (iii) The cost of debt is less than the cost of equity.

The theory works like this.

“As the proportion of cheaper debt funds in the capital structure increases, the weighted average cost of capital decreases and approaches the cost of debt.

This theory recommends 100% debt financing is optimal capital structure. The following are the strengths of NoI approach:

- (i) it tries to explain the effects of borrowings on overall cost of capital.
- (ii) It explains and emphasizes on favourable financial leverage.
- (iii) However, the theory ignores the risk consideration.

3.6.2 Net Operating Income (NoI) approach

This approach, also propounded by Durand, is just opposite of Net Income (NI) approach. According to this approach overall cost of capital and value of the firm are independent of capital structure decision and change in degree of financial leverage does not bring about and change in value of the firm and cost of capital.

The approach is based on the following assumptions:

- (i) The overall cost of capital (k_o) remains constant for all degrees of debt equity mix or leverage.
- (ii) There are no corporate taxes.
- (iii) The market capitalizes the value of the firm as a whole.
- (iv) The advantage of debt is set off exactly by increase in the equity capitalization rate.

According to the NOI Approach, the value of a firm can be determined by the following equation;

$$V = \frac{EBIT}{K_o}$$

Where:

- V = Value of firm;
- K_o = Overall cost of capital
- EBIT = Earnings before interest and tax.

Thus, according to Net Operating Income (NOI) Approach, any capital structure will be optimum.

The following are the strengths of NOI approach:

- (i) it emphasizes on the role of NOI in the determination of total value of the firm,
- (ii) According to this theory, new investment proposals should be based on NOI approach

This theory seems to ignore the behavioral aspect of financing function of management.

3.6.3 Modiglian- Miller (MM) Theory

The Modigliani-Miller (MM) approach is similar to the Net Operating Income (NOI) approach. It supports the NOI approach providing behavioural justification for the independence of the total valuation and the cost of capital of the firm from its capital structure. In other words, MM approach maintains that the weighted average cost of capital does not change with change in the capital structure of the firm.

The following are the three basic propositions of the MM approach:

- (i) The overall cost of capital (K_o) and the value of the firm (V) are independent of the capital structure.
- (ii) The cost of equity (KE) is equal to capitalization rate of a pure equity stream plus a premium for the financial risk.
- (iii) The cut-off rate for investment purposes is completely independent of the way in which an investment is financed.

The MM approach is subject to the following assumptions:

1. Capital markets are perfect.
2. All firms within the same class will have the same degree of business risk.
3. All investors have the same expectation of a firm's net operating income (EBIT).
4. The dividend pay-out ratio is 100%.
5. There are no corporate taxes. However, this assumption was removed later.

The “arbitrage process” is the operational justification of MM hypothesis. The term ‘Arbitrage’ refers to an act of buying an asset or security in one market having lower price and selling it in another market at a higher price. The consequence of such action is that the market price of the securities of the two firms exactly similar in all respects except in their capital structures can not for long remain different in different markets. Thus, arbitrage process

restores equilibrium in value of securities. This is because in case the market value of the two firms which are equal in all overvalued firm would sell their shares, borrow additional funds on personal account and invest in the undervalued firm in order to obtain the same return on smaller investment outlay. The use of debt by the investor for arbitrage is termed as 'home made' or 'personal leverage'.

The following are limitations of MM's theory-

- (i) Rates of interest are not the same for the individuals and the firms.
- (ii) Transactional costs are involved.
- (iii) Home made leverage is not perfect substitute for corporate leverage.
- (iv) The effectiveness of arbitrage process is limited.

Since corporate taxes do exist, MM agreed in 1963 that the value of the firm will increase and overall cost of capital will decline because of tax deductibility of interest payments. A levered firm should have, therefore, a greater market value as compared to an unlevered firm. The value of the levered firm would exceed that of the unlevered firm by an amount equal to the levered firm's debt multiplied by the tax rate. The formula is-

$$V_i = V_u + Bt$$

Where :

- V_i = Value of levered firm
- V_u = Value of an unlevered firm
- B = Amount of Debt and
- t = Tax rate

3.6.4 Traditional Approach

The traditional theory assumes changes in K_e at different levels of debt equity rate. It is the middle of the two extremes of NI and NOI.

Beyond a particular point of debt-equity mix, k_e rises at an increasing rate. There are three stages:-

Stage I – Introduction of debt-Net Income rises; cost of equity capital rises because of risk but less than earnings rate leading to decline in overall cost of capital and increase in Market value.

Stage II – Further Application of debt: cost of equity capital rises-net income – debt cost increases – value same.

Stage III – Further Application of debt – cost of equity capital is very high – value goes down.

Example

Raj Cosmetics Ltd. has estimated the following rates of return (Column (3) of the Table 3.9. Table 3.9 also gives the seven capital structures from the debt ratios ranging from 0% to 60% and expected EPS in Rs. (from Table 3.6).

From these data, it is possible to work out the expected share values in each of the alternative capital structures. Calculations are set out in column 4 of the Table 3.9.

Table 3.9: Calculation of Share Value Estimate Associated with Alternative Capital Structures for Raj Cosmetics Ltd.

Capital structure debt ratio (%)	Expected EPS (Rs.) (From Table 3.6)	Estimated required rate of return Esti. by the Co.)	Estimated Share Value (Rs.)
(1)	(2)	(3)	(4)
0	2.40	0.115	20.87
10	2.55	0.117	21.79
20	2.72	0.121	22.48
30	2.91	0.125	23.28
40	3.12	0.140	22.29
50	3.18	0.165	19.27
60	3.03	0.190	15.95

Table 3.9 shows that the maximum share value occurs at the capital structure associated with the debt ratio of 30%. This is the optimal capital structure. It is noticeable that EPS is maximized at 50% debt ratio, while the share value is maximized at 30% debt ratio. This discrepancy arises because EPS maximization approach does not consider the risk as reflected in required rates of return.

In addition to the analysis of the EBIT-EPS, required rates of returns and share value, certain other factors are also taken into account in determining the capital structure for the firm. These are listed below:

- Adequacy of cash flow to service debt and preference shares
- Having stable and predictable revenues
- Limitations imposed by previous contractual obligations
- Management Preference and attitudes towards risk
- Assessment of the firm's risk by financial institutions and other agencies
- Capital market conditions and investor preferences
- Considerations of corporate control.

Activity 3

1) In what manner are the corporate taxes relevant to capital structure decision?

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2) Contrast traditional and M-M position regarding optimal capital structure.

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3) Name of single most important factor which determines the capital structure of a company.

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4) Try to know from Finance Manager of any two companies:

i) What is their present capital structure?

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ii) What are the factors which determine their capital structure?

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iii) Do they intend to change their capital structure in the near future ?
why?

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5) Show arbitrage process with an example.

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3.7 FACTORS INFLUENCING PATTERN OF CAPITAL STRUCTURE

Following are the major factors which should be kept in view while determining the capital structure of a company:

(1) Size of Business

Smaller firms confront tremendous problems in assembling funds because of their poor creditworthiness. Investors feel loath in investing their money in securities of these firms. Lenders prescribe highly restrictive terms in lending. In view of this, special attention should be paid to maneuverability principle. This is why common stock represents major portion of this capital in smaller concerns. Larger concerns have to employ different types of securities to procure desired amount of funds of reasonable cost because they find it very difficult to raise capital at reasonable cost of demand for funds is restricted to a single source.

(2) Form of Business Organisation

Control principle should be given higher weightage in private limited companies where ownership is closely held in a few hands. This may not be so imminent in the case of public limited companies whose shareholders are large in number. In proprietorship or partnership form of organisation, control is undoubtedly an important consideration because control is concentrated in a proprietor or a few partners.

(3) Nature of Enterprise

Business enterprises which have stability in their earnings or which enjoy monopoly regarding their products may go for debentures or preference shares since they will have adequate profits to meet the recurring cost of interest/fixed dividend. This is true in case of public utility concerns. On the other hand, companies which do not have this advantage should rely on equity share capital to a greater extent for raising their funds. This is, particularly, true in case of manufacturing enterprises.

(4) Stability of earnings

With greater stability in sales and earnings a company can insist on the fixed obligation debt with less risk. But a company with irregular income will not choose to burden itself with fixed charge. Such company should depend upon the sale of stock to raise capital.

(5) Age of Company

Younger companies generally find it difficult to raise capital in the initial years because of greater uncertainty involved in them and also because they are not known to suppliers of funds. It would therefore, be worthwhile for such companies accord to higher weightage to maneuverability factor. In a sharper contrast to this, established companies with good earnings record are always in comfortable position to raise capital from whatever sources they like. Leverage principle should be insisted upon in such concerns.

(6) Purpose of Financing

In case funds are required for some directly productive purposes the company can afford to raise the funds by issue of debentures. On the other hand, if the funds are required for non-productive purposes, providing more welfare facilities to the employees the company should raise the funds by issue of equity shares.

(7) Market Sentiments

Times of boom investors generally want to have absolute safety. In such cases, it will be appropriate to raise funds by issue of debentures. At other periods, people may be interested in earnings high speculative incomes; at such times, it will be appropriate to raise funds by issue of equity shares.

(8) Credit Standing

A company with high credit standing has greater ability to adjust sources of funds upwards or downwards in response to major changes in need for funds than one with poor credit standing. In the former case the management should pay greater attention to maneuverability factor.

(9) Period of Finance

The period for which finance is required also affects the determination of capital structure of companies. In case, funds are required, say, for 5 to 10 years, it will be appropriate to raise them by issue of debentures. However, if the funds are required more or less permanently, it will be appropriate to raise them by issue of equity shares.

(10) Legal Requirements

Companies Act, Banking Co. Act etc. influence the capital structure considerations. The relative weightage assigned to each of these factors will vary widely from company to company depending upon the characteristics of the company, the general economic conditions and the circumstances under

which the company is operating. Companies issue debentures and preference shares to enlarge the earnings on equity shares, while equity shares are issued to serve as a cushion to absorb the shocks of business cycles and to afford flexibility. Of course, greater the operating risk, the less debt the firm can use, hence, in spite of the fact that the debt is cheaper the company should use it with caution.

(11) Tax Considerations

The existing taxation provision makes debt more advantageous in relation to stock capital in as much as interest on bonds is a tax deductible expense whereas dividend is subject to tax. In view of prevailing corporate tax rates in India, the management would wish to raise degree of financial leverage by placing greater reliance on borrowing.

3.8 RELEVANCE OF DEBT – EQUITY RATIO IN PUBLIC ENTERPRISES

It is generally argued that the practical significance of the debt-equity ratio is limited in the case of public enterprises in many countries because most of the loans are derived from the government itself or from public sector financial institutions. The government as the owner as well as the lender, has access to all the information it needs about the financial health of the enterprise and does not need to refer to any favourable ratio to derive confidence before making loans to it. Even when the public enterprises are allowed to borrow from private banks or from foreign financial institutions, there is a government guarantee in one form or another that the loans will be removed and lightened by adoption of an appropriate policy measures.

Since all this has the effect of making institutional arrangements for sharing risk and thus reducing the disadvantages of debt, a case could be made for justifying higher debt-equity ratios for public enterprises. A few observations in this regard are made as under :

- (a) Since not all of the public enterprise are wholly owned and financed (through loans) by government and there are many joint ventures, so that institutional arrangements for diluting risks are not always available to these enterprises, it has to be appreciated that in real life, public enterprises have to face the bias of the lending agencies (local or foreign) towards this measure of the strength of their capital structure.
- (b) In most of the countries public enterprises ministries e.g. planning and finance, for a critical scrutiny and appraisal of their proposals. In any case, the government owned financial institutions can be should be expected to raise points also at the risk of further lending to an enterprise, the debt-equity ratio of whose capital structure is not in line with the normal or which does not appear to be quite sound in context of its financial prospects. Many of the worthwhile plans of investment in public enterprises, whether for replacement and rehabilitation of existing assets or for expansion and diversification, require significant amounts of foreign exchange. If these resources are arranged from foreign lending agencies like the world Bank/IDA, the creditors make it a point to specify adherence to a range of 'healthy' debt-equity ratios (and also to a conservative dividend disbursement policy) till their loans are repaid.
- (c) It is also desirable from the enterprise's own point of view to see that a sufficiently high proportion of equity is maintained in its capital structure because it should enable it some freedom of action in the matter of retaining its earnings for its "self-financed" projects or for financing a part

of its working capital, provided, of course, that it is in the happy position of making profits. In the case of other enterprises which operate at a loss (whether because of government imposed pricing policies or because of their inefficiencies), there is usually a demand for concerting at least a part of their loan capital into equity capital. When such proposals are being formulated and examined, the question of a reasonable or proper debt-equity ratio for the type of enterprises under consideration is raised sooner or later.

- (d) With an inappropriately high debt-equity ratio, the initial cost of a project/manufacturing facility put up by a public enterprise has the effect of increasing the fixed costs of operation through the capitalization of interest during construction. This is likely to place the enterprise in a disadvantageous position vis-à-vis its competitors and can lead to a vicious cycle of accumulation of losses, under utilization of capacity, low morale of workers and management inefficiencies, short-term (and strategically unsuitable) solutions and further losses. Having once been trapped in this situation, it is difficult indeed for the enterprise to extricate itself and rehabilitate its capital structure, particularly when the Government departments ministries are not very prompt in analyzing the causes of these problems and providing the requisite relief's.
- (e) There cannot be must argument with the proposition that, in long run, the equity portion of a public enterprise must not be regarded as a device of cash convenience and as a no-cost input, because it certainly has an opportunity cost for the economy as a whole. Public enterprises have, as a general rule, to operate under pricing and operating policies dictated by their owner governments socio-economic (and political) objectives. Debt-equity ratio is one device by which the enterprise can be considered to have been compensated for its expenses/losses on meeting these additional obligations.
- (f) If a certain range of debt-equity ratios is adopted for enterprise in a particular sector of the economy, it can result in fixing a concessional rate of interest/return on the capital mix (loan at market rate plus equity at zero percent).

It may, thus, be concluded that the view that the practical significance of the debt-equity ratio is limited in the case of public enterprise is not based on a complete appreciation of all the factors in which these enterprises have to operate in many developing countries. While the private sector analogy in this respect may have to be qualified suitably when applied to the public enterprise situation in a particular country, it will remain a useful indicator, both with the administrative ministers and with the enterprise managements, to assess the strength of their capital structures.

Activity 4

- 1) Bring out five factors that influence capital structure.

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- 2) "Debt Equity Ratio is not relevant for public enterprises" Comment.

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3.9 SUMMARY

A firm's capital structure is determined by the mix of long-term debt and equity it uses in financing its operations. Financial structure means the composition of the entire left hand side of the balance sheet. The basic differences in debt (including preference shares) and equity capital are in respect of the voting rights, the claims on income and assets, and the tax treatment. Timing, flexibility, cost, risk and control principles are the criteria for determining pattern of capital structure.

A firm's capital structure should be consistent with its business risk and result in an acceptable financial risk. The EBIT-EPS analysis can be used to evaluate various capital structure in the light of the degree of financial risk and the returns to the equity shareholders. The EBIT-EPS analysis shows how the desirable capital structure gives the maximum EPS.

The mathematical relationship between ROI is

$$[(ROE + ROI - r) D/E] (1-t)$$

NI and NOI theories of capital structures are extreme. The MM analysis suggests that the optimal capital structure does not matter and that as much debt as possible should be used because the interest is tax-deductible. The MM hypothesis is criticized because of its unreal assumptions. Tax adjustment makes it more realistic.

The traditional approach to capital structure indicates that the optimal capital structure for the firm is one in which the overall cost of capital is minimized and the share value is maximized.

The cost of debt increases beyond a certain level of leverage.

Certain qualitative considerations such as cash flow, corporate control, contractual obligations, management's risk tolerance, etc. are taken into consideration while determining the capital structure.

The practical significance of Debt-Equity ratio for public enterprises is limited and has different perspectives.

3.10 KEYWORDS

Capital Structure is the proportions of all types of long-term capital. Financial Structure is the proportions of all types of long-term and short-term capital.

EBIT = Earnings before Interest and taxes.

EPS = Earnings per share

NI Approach says more usage of debt will enhance the value of the firm.

NOI Approach says that the total value of the firm remains constant irrespective of the debt-equity mix. Arbitrage refers to an act of buying a security in one market having lower price and selling it in another market at a higher price. The consequence of such action is that the market price of the securities will become the same.

3.11 SELF ASSESSMENT QUESTIONS/EXERCISES

1. What is a firm's capital structure? How is it different from financial structure?
2. Under the traditional approach to capital structure, what happens to the cost of debt and cost of equity as the firm's financial leverage increases?
3. Explain ROI-ROE analysis.
4. Explain the EBIT-EPS approach to the capital structure. Are maximizing value and maximizing EPS the same?
5. Khosla Ltd. had made the following forecast of sales, with the associated probability of occurrence.

Sales Rs.	Probability
2,00,000	0.20
3,00,000	0.60
4,00,000	0.20

The company has fixed operating costs of Rs.1,00,000 per year and variable operating costs represent 40% of sales. The existing capital structure consists of 25,000 equity shares of Rs. 10 each. The market place has assigned the following discount rates to risky earnings per share.

Co-efficient of variation of EPS	Estimated Required Returns %
.43	15
.47	16
.51	17
.56	18
.60	22
.64	24

The company is considering changing its capital structure by increasing debt in the capital structure vis-à-vis capital. Different debt ratios are considered, given here with the estimate of the required interest rate on all debt.

Debt Ratio	Interest on all debt
20%	10%
40%	12%
60%	14%

The tax rate is 40% percent.

- a) Calculate the expected earnings per share, the standard deviation of EPS and the co-efficient of variation of EPS for the three proposed capital structures.
- b) Determine the optimal capital structure, assuming (i) maximization of ePS and (ii) maximization of share value.
- c) Construct a graph showing relationship in (b).
6. Critically examine various theories of capital structure.
7. Narrate the factors influencing capital structure.
8. Explain the criteria for determining pattern of capital structure.
9. Discuss the relevance of debt-equity ratio for Indian Public Enterprises.
10. Assume the figures of an Indian company and examine the relevance of MM's theory of capital structure.

3.12 FURTHER READINGS

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