Lesson - 8

CAPITAL STRUCTURE - DETERMINANTS AND THEORIES

OBJECTIVES

After studying this lesson you will be able to learn:

- * the meaning of capital structure and optimum capital structure
- the major determinants of capital structure of a firm
- the various theories of capital structure

STRUCTURE

- 8.1 Introduction
- 8.2 Features of an appropriate capital structure
- 8.3 Determinants of capital structure
- 8.4 Optimum capital structure meaning
- 8.5 Theories of capital structure

Net Income approach

Net operating income approach

The Traditional View

Modigliani - Miller hypothesis without taxes

M-M Hypothesis with corporate taxes

- 8.6 Summary
- 8.7 Key Words
- 8.8 Self assessment questions
- 8.9 Further Readings

8.1 Introduction

A firm needs funds for long - term requirements and working capital. These funds are raised through different sources both short - term and long - term. The long - term funds required by a firm are mobilised through owners' funds (equity share, preference shares and retained earnings) and long - term debt (debentures and bonds). A mix of various long - term sources of funds employed by a firm is called capital structure. In this lesson, we discuss the meaning of capital structure, determinants of capital structure and various theories that explain the relationship between capital structure and cost of capital and capital structure and value of the firm. Capital structure refers to the long - term sources of funds employed by firm, viz, equity shares, preference shares, reserves and debt capital.

According to Gerestenberg, "Capital structure of a company refers to the composition or make - up of its capitalisation and it includes all long - term capital resources, viz, loans, bonds, shares and reserves" Thus capital structure is made - up of debt and equity securities and refers to permanent financing of a firm!

8.1.1 Capital structure and Financial Structure

Some authors use capital structure and financial structure interchangeably. But, both are different concepts. Financial structure refers to the way in which the total assets of a firm are financed. In other words, financial structure refers to the entire liabilities side of the balance sheet. But, capital structure represents only long - term sources of funds and excludes all short - term debt and current liabilities. Thus, financial structure is a broader one and capital structure is only a part of it.

8.3 Features of an appropriate capital structure

It is the duty of the financial manager to develop an appropriate capital structure which is most advantageous to the company. The capital structure should be planned carefully keeping in view, the interests of the equity shareholders as they are the ultimate owners of the company.

The planning and designing of an appropriate capital structure is not an easy task. However, it must be seen while designing the capital structure, that a sound or appropriate capital structure should have the following features:

- i) Profitability: The capital structure of the company should be most advantageous. It should maximise the earnings per share while minimising cost of financing.
- ii) Solvency: Excessive use of debt threatens the solvency of the company. Therefore, the debt capital should be employed upto such a level that the financial risk is within manageable limits.
- **Flexibility:** The capital structure should be flexible enough to meet the changing conditions. It must be possible for the company to provide funds whenever needed to finance any profitable activities.
- iv) Conservatism: The capital structure of the company should be conservative in the sense that the debt component of the firm should not exceed debt capacity of the firm. The debt capacity of the firm depends on its ability to generate enough future cashflows for meeting interest obligation and repayment of principal when it becomes due.
- v) Control: The capital structure should be designed in such a way that it involves a minimum loss of control of the company by the existing shareholders/directors.

The above mentioned are the general features of an appropriate capital structure. The relative importance of these features may differ from one company to another. For example, one company may give more importance to flexibility to conservatism, and another company may go for solvency rather than profitability. But it may be said that the company's capital structure should be easily adaptable.

8.3 Determinants of capital structure

The capital structure of a firm depends on a number of factors and these factors are of different importance. Moreover, the influence of individual factors of a firm changes over a period of time. Generally, the following factors should be considered while determining the capital structure of a company.

i) Trading on equity and EBIT - EPS analysis.

The use of long - term debt and preference share capital, which are fixed income - bearing securities, along with equity share capital is called financial leverage or trading on equity. The use of long - term debt capital increases the earnings per share (EPS) as long as the return on investment (ROI) is greater

than the cost of debt. Preference share capital will also result in increasing EPS. But the leverage effect is more pronounced in case of debt because of two reasons: i) cost of debt is usually lower than the cost of preference share capital, and ii) the interest paid on debt is tax deductible.

Because of its effects on the earnings per share, financial leverage is one of the important considerations in planning the capital structure of a company. The companies with high level of Earnings Before Interest and Taxes (EBIT) can make profitable use of the high degree of leverage to increase the return on the shareholders' equity. The EBIT - EPS analysis is one important tool in the hands of the financial manager to get an insight into the firm's capital structure planning. He can analyse the possible fluctuatons in EBIT and their impact on EPS under different financing plans.

Under favourable conditions, financial leverage increases EPS, however it can also increase financial risk to shareholders. Therefore, the firm should employ debt to such an extent that financial risk does not spoil the leverage effect.

ii) Growth and stability of sales

This is another important factor which influences the capital structure of a firm. Stability of sales ensures stable earnings, so that the firm will not face any difficulty in meeting its fixed commitments of interest payment and repayment of debt. So the firm can raise a higher level of debt. In the same way, the rate of growth in sales also affects the capital structure decision. Usually, greater the rate of growth of sales, greater can be the use of debt in the financing of a firm. On the other hand, the firm should be very careful in employing debt capital if its sales are highly fluctuating and declining.

iii) Cost of capital

Cost of capital is another important factor that should be kept in mind while designing the capital structure of a firm. The capital structure should be designed in such a way that the firm's overall cost of capital is the minimum. Cost of capital is the minimum return expected by its suppliers. Of all the sources of capital, equity capital is the costliest as the equity shareholders bear the highest risk. On the other hand, debt capital is the cheapest source because the interest is paid on it by the firm whether it makes profits or not. Moreover, interest on debt capital is tax deductible, which makes it further cheaper. Preference share capital is also cheaper than equity capital as the dividends are paid at a fixed rate on preference shares. So, the overall cost of capital depends on the proportion in which the capital is mobilised from different sources of finance. Hence, capital structure should be designed carefully so that over all cost of capital is minimised.

iv) Cash flow ability

A firm which has the ability of generating larger and stable cash inflows will be able to employ more debt capital. The firm has to meet fixed charges in the form of interest on debt capital, fixed preference dividend and the principal amount, when it becomes due. The firm can meet these fixed obligations only when it has adequate cash inflows. Whenever a firm wants to raise additional funds, it should estimate the future cash inflows to ensure the coverage of fixed charges. Fixed charges coverage ratio and interest coverage ratio are relevant for this purpose.

Here, one important point to be considered is that it is the cash flow ability of the firm and not the earning capacity alone (as indicated by EBIT) that should be taken into view while designing the capital structure. A firm may have adequate profits (EBIT) but it may not have adequate cash inflows to meet its fixed charges obligation. Some times, inadequacy of cash inflows may lead the firm to the point of insolvency, when it fails to meet its payment obligations in time. Therefore debt capacity of the firm is determined by its cash flow ability.

v) Control

Some times, the designing of capital structure of a firm is influenced by the desire of the existing management to retain the control over the firm. Whenever additional funds are required, the management of the firm wants to raise the funds without any loss of control over the firm. If equity shares are issued for raising funds, the control of the existing shareholders is diluted. Because of this, they may raise the funds by issuing fixed charge bearing debt and preference share capital, as preference shareholders and debtholders do not have any voting right. The Debt financing is advisable from the point of view of control. But overdependence on debt capital may result in heavy burden of interest and fixed changes and may lead to liquidation of the company.

vi) Flexibility

Flexibility means the firm's ability to adapt its capital structure to the needs of the changing conditions. Capital structure should be flexible enough to raise additional funds whenever required, without much delay and cost. The capital structure of the firm must be designed in such a way that it is possible to substitute one form of financing for another to economise the use of funds. Preference shares and debentures offer the highest flexibility in the capital structure, as they can be redeemed at the discretion of the firm.

vii) Size of the firm

The size of the firm influences the capital structure design of a firm. Small companies find it very difficult to mobilise long - term debt, as they have to face higher rate of interest and inconvenient terms. Hence, small firms make their capital structure very inflexible and depend on share capital and retained earnings for their long - term funds. Since their capital structure is small, small firms cannot go to the capital market frequently for the issue of equity shares, as it carries a greater danger of loss of control over the firm to others. Hence, the small firms sometimes limit the growth of their business and any additional fund requirements met through retained earnings only. However, a large firm has relative flexibility in capital structure designing. It has the facility of obtaining long - term debt at relatively lower rate of interest and convenient terms. Moreover, the large firms have relatively an easy access to the capital market.

viii) Marketability and timing

Capital market conditions may change from time to time. Sometimes there may be depression and at other times there may be boom condition in the market. The firm should decide whether to go for equity issue or debt capital by taking market sentiments into consideration. In the case of depressed conditions in the share market, the firm should not issue equity shares but go for debt capital. On the other hand, under boom conditions, it becomes easy for the firm to mobilise funds by issuing equity shares.

The internal conditions of a firm may also determine the marketability of securities. For example, a highly levered firm may find it difficult to raise additional debt. In the same way, a firm may find it very difficult to mobilise funds by issuing any kind of security in the market merely because of its small size.

ix) Floatation costs

Floatation costs are not a very significant factor in the determination of capital structure. These costs are incurred when the funds are raised externally. They include cost of the issue of prospectus, brokerage, commissions, etc. Generally, the cost of floatation for debt is less than for equity. So, there

may be a temptation for debt capital. There will be no floatation cost for retained earnings. As is said earlier, floatation costs are not a significant factor except for small companies.

Floatation costs can be an important consideration in deciding the size of the issue of securities, because these costs as a percentage of funds raised will decline with the size of the issue. Hence, greater the size of the issue, more will be the savings in terms of floatation costs. However, a large issue affects the firms's financial flexibility.

x) Purpose of financing

The purpose for which funds are raised should also be considered while determining the sources of capital structure. If funds are raised for productive purpose, debt capital is appropriate as the interest can be paid out of profits generated from the investment. But, if it is for unproductive purpose, equity should be preferred.

xi) Legal requirements

The various guidelines issued by the Government from time to time regarding the issue of shares and debentures should be kept in mind while determining the capital structure of a firm. These legal restrictions are very significant as they give a framework within which capital structure decisions should be made.

8.4 Optimum capital structure

The capital structure of a firm influences its cost of capital and the value of the firm. So, the financial manager of the firm should aim at achieving the optimum capital structure and then to maintain it. An optimum capital structure may be defined as that combination of debt and equity that maximise the total value of the firm or minimises the weighted average cost of capital. According to Ezra Solomon, the optimum capital structure refers to that degree of financial leverage at which the market value of the firm's securities will be higher or the cost of capital will be lower than at other degrees of leverage.

8.5 Theories of capital structure

But, the existence of an optimum capital structure is not accepted by all. There are two extreme views or schools of thought regarding the existence of an optimum capital structure. As per one view, capital structure influences the value of the firm and cost of capital and hence there exists an optimum capital structure. On the other hand, The other school of thought advocates that capital structure has no relevance and it does not influence the value of the firm and cost of capital. Reflecting these views, different theories of capital structure have been developed. The main contributors to the theories are David Durand, Ezra Solomon, Modigliani and Miller.

The important theories of capital structure are:

Net Income Approach

Net Operating Income Approach

The Traditional view

Modigliani and Miller hypothesis

Assumptions Underlying the Theories:

In order to have a clear understanding of these theories and the relationship between capital structure and value of the firm or cost of capital, the following assumptions are made:

- i) Firms employ only debt and equity.
- ii) The total assets of the firm are given.
- iii) The firm's total financing remains constant. The degree of leverage can be changed by selling debt to repurchase shares or selling shares to retire debt.
- iv) The firm has 100% payout ratio, i.e., it pays 100% of its earnings as dividends.
- v) The operating earnings (EBIT) of the firm are not expected to grow.
- vi) The business risk is assumed to be constant and independent of capital structure and financial risk.
- vii) Investors have the same subjective probability distribution of expected future operating earnings for a given firm.
- viii) There are no corporate and personal taxes. This assumption it relaxed later.

In analysing the capital structure theories the following basic definitions are used:

S = market value of common shares

D = market value of debt

V = S + D = market value of the firm

 $NOI = \bar{X} =$ expected net operating income, i.e., Earnings before interest and taxes (EBIT)

NI = NOI - Interest = Net Income or shareholders earnings.

8.5.1. Net Income Approach

This approach was identified by David Durand. According to this approach, capital structure has relevance, and a firm can increase the value of the firm and minimise the overall cost of capital by employing debt capital in its capital structure. According to this theory, greater the debt capital employed, lower shall be the overall cost of capital and more shall be the value of the firm.

This theory is subject to the following assumptions:

- i) The cost of debt is less than cost of equity.
- ii) The risk perception of investors is not affected by the use of debt. As a result, the equity capitalisation rate (ke) and the debt capitalisation rate (kd) don't change with leverage.
- iii) There are no corporate taxes.

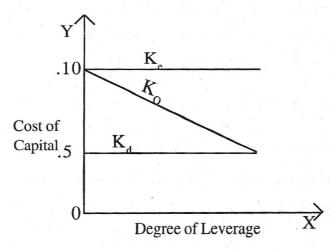
According to the above assumptions, cost of debt is cheaper than cost of equity and they remain constant irrespective of the degree of leverage. If more debt capital is used because of its relative cheapness, the overall cost of capital declines and the value of the firm increases.

According to this approach:

$$V = S + D$$

$$S = market value of equity = \frac{NI}{K_e}$$

$$K_0$$
= overal cost of capital = $\frac{EBIT}{V}$



NI Approach: Figure 8:1

It is evident from the above diagram that when degree of leverage is zero (i.e. no debt capital employed), overal cost of capital is equal to cost of equity $(k_0 = k_c)$. If debt capital is employed further and further which is relatively cheap when compared to cost of equity, the overall cost of capital declines, and it becomes equal to cost of debt (k_d) when leverage is one (i.e. the firm is fully debt financed). Thus, according to this theory, the firms's capital structure will be optimum, when degree of leverage is one.

8.5.2. Net operating Income Approach

This net operating income (NO I) approach is also suggested by David Durand. This represents another extreme view that capital structure and value of the firm are irrelevant. The capital structure of the firm does not influence cost of capital and value of the firm. The value of the firm (V) is determined as follows:

$$V = S + D = \frac{NOI}{K_0}$$

 K_0 is the overall cost of capital and depends on the business risk of the firm. It is not affected by financing mix.

The critical assumptions of this theory are:

- 1. The market capitalises the value of the firm as a whole. Thus, the split between debt and equity is not important.
- 2. The business risk remains constant at every level of debt equity mix.

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- 3. There are no corporate taxes.
- 4. The debt capitalisation rate (K_d) is constant.

According to this theory, the use of less costly debt increases the risk to equity shareholders. This causes the equity capitalisation rate (K_e) to increase. As a result, the low cost advantage of debt is exactly offset by the increase in the equity capitalisation rate. Thus, the overall capitalisation rate (K_0) remains constant and consequently the value of the firm does not change.

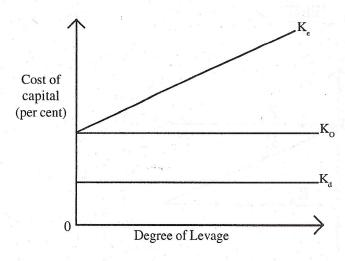


Chart 8.2 NoI Approach:

The above diagram shows that K_0 and K_d are constant and K_c increases with leverage continuously. The increase in cost of equity (K_c) exactly offsets the advantage of low cost debt, so that overall cost of capital (K_0) remains constant, at every degree of leverage. It implies that every capital structure is optimum and there is no unique optimum capital structure.

8.5.3. The traditional view

This approach, which is also known as intermediate approach, has been popularised by Ezra Solomon. It is a compromise between the two extremes of net income approach and net operating income approach. According to this approach, cost of capital can be reduced or the value of the firm can be increased with a judicious mix of debt and equity. This theory says that cost of capital declines with increase in debt capital upto a reasonable level, and later it increases with a further rise in debt capital.

The way in which the overall cost of capital reacts to changes in capital structure can be divided into three stages under traditional position.

Stage I

In this stage, the cost of equity (K_c) and the cost of debt (K_d) are constant and cost of debt is less than cost of equity. The employment of debt capital upto a reasonable level will cause the overall cost of capital to decline due to the low cost advantage of debt.

Stage II:

Once the firm has reached a reasonable level of leverage, a further increase in debt will have no effect on the value of the firm and the cost of capital. This is because of the fact that a further rise in debt

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capital increases the risk to equity shareholders which leads to a rise in equity capitalisation rate (K_c). This rise in cost of equity exactly offsets the low - cost advantage of debt capital so that the overall cost of capital remains constant.

Stage III

If the firm increases debt capital further and further beyond reasonable level, it will cause an increase in risk to both equity shareholders and debt - holders, because of which both cost of equity and cost of debt start rising in this stage. This will in turn will cause an increase in overall cost of capital.

If the overall effect of all the three stages is taken. it is evident that cost of capital declines and the value of the firm increases with a rise in debt capital upto a certain reasonable level. If debt capital is further increased beyond this level, the overall cost of capital (K_0) tends to rise and as a result the value of the firm will decline.

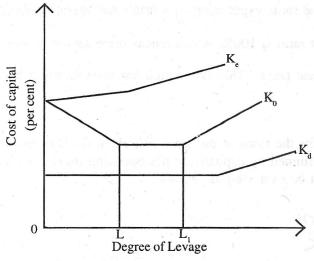


Figure 8.2 Traditional view:

It is evident from Figure 8.2 that the overall cost of capital declines with an increase in leverage upto point L and it increases with rise in the leverage after point L_1 . Hence, the optimum capital structure lies in between L and L_1 .

8.5.4. Modigliani - Miller (MM) Hypothesis - Without Taxes

The Modigliani - Miller hypothesis is identical with the net operating Income approach. Modigliani and Miller argued that, in the absence of taxes the cost of capital and the value of the firm are not affected by the changes in capital structure. In other words, capital structure decisions are irrelevant and value of the firm is independent of debt - equity mix.

Basic Propositions:

- M M Hypothesis can be explained in terms of two propositions of Modigliani and Miller. They are:
- (i) The overall cost of capital (K_0) and the value of the firm are independent of the capital structure. The total market value of the firm is given by capitalising the expected net operating income by the rate appropriate for that risk class.

(ii) The financial risk increases with more debt content in the capital structure. As a result cost of equity (K_c) increases in a manner to offset exactly the low - cost advantage of debt. Hence, overall cost of capital remains the same.

Assumptions of the MM Approach:

- 1. There is a perfect capital market. Capital markets are perfect when i) investors are free to buy and sell securities, ii) they can borrow funds without restriction at the same terms as the firms do, iii) they behave rationally, iv) they are well informed, and v) there are no transaction costs
- 2. Firms can be classified into homogeneous risk classes. All the firms in the same risk class will have the same degree of financial risk.
- 3. All investors have the same expectation of a firm's net operating income (EBIT).
- 4. The dividend payout ratio is 100%, which means there are no retained earnings.
- 5. There are no corporate taxes. This assumption has been removed later.

Proposition I

According to M - M, for the firms in the same risk class, the total market value is independent of capital structure and is determined by capitalising net operating income by the rate appropriate to that risk class. Proposition I can be expressed as follows:

$$V = S + D = \frac{\bar{x}}{K_0} = \frac{NOI}{K_0}$$

Where, V= the market value of the firm

S = the market value of equity

D = the market value of debt

x = the expected net operating income (EBIT)

 K_0 = the capitalisation rate appropriate to the risk class of the firm.

According to proposition I the average cost of capital is not affected by degree of leverage and is determined as follows:

$$K_0 = \frac{x}{V}$$

According to M-M, the average cost of capital is constant as shown in the following Figure 8.3:

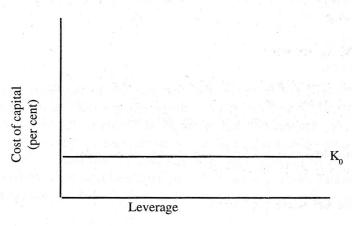


Figure 8.3 Avage cost of capital

Arbitrage process:

According to M-M, two firms identical in all respects except their capital structure, cannot have different market values or different cost of capital. In case, these firms have different market values, the arbitrage will take place and equilibrium in market values is restored in no time. Arbitrage process refers to switching of investment from one firm to another. When market values are different, the investors will try to take advantage of it by selling their securities with high market price and buying the securities with low market price. The use of debt by the investors is known as personal leverage or home made leverage.

Because of this arbitrage process, the market price of securities in higher valued market will come down and the market price of securities in the lower valued market will go up, and this switching process is continued until the equilibrium is established in the market values. So, M M argue that there is no possibility of different market values for identical firms.

Reverse working of Arbitrage process:

Arbitrage process also works in the reverse direction. Leverage has neither advantage nor disadvantage. If an unlevered firm (with no debt capital) has higher market value than a levered firm (with debt capital) arbitrage process works in reverse direction. Investors will try to switch their investments from unlevered firm to levered firm so that equilibrium is established in no time.

Thus, M-M proved in terms of their proposition I that the value of the firm is not affected by debt - equity mix.

Proposition II

M-M's proposition II defines cost of equity. According to them, for any firm in a given risk class, the cost of equity is equal to the constant average cost of capital (K_0) plus a premium for the financial risk, which is equal to debt - equity ratio times the spread between average cost and cost of debt. Thus, cost of equity is:

$$K_{e} = K_{o} + \left(K_{o} - K_{d}\right) \frac{D}{S}$$

where, $K_{e} = \cos t$ of equity

D/S = debt - equity ratio

M-M argue that K_0 will not increase with the increase in the leverage, because the low - cost advantage of debt capital will be exactly offset by the increase in the cost of equity as caused by increased risk to equity shareholders. The crucial part of the M-M Thesis is that an excessive use of leverage will increase the risk to the debt holders which results in an increase in cost of debt (Kd). However, this will not lead to a rise in K_0 . M M maintain that in such a case K_c will increase at a decreasing rate or even it may decline. This is because of the reason that at an increased leverage, the increased risk will be shared by the debtholders. Hence K_0 remains constant. This is illustrated in the Figure 8.9 given below :

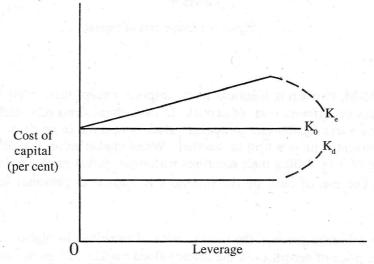


Figure 8.3 M M Hypothesis and cost of capital

Criticism of M M Hypothesis

The arbitrage process is the behavioural and operational foundation for M M Hypothesis. But this process fails to bring the desired equilibrium because of the following limitations.

- Rates of interest are not the same for the individuals and firms. The firms generally have a higher credit standing because of which they can borrow funds at a lower rate of interest as compared to individuals.
- 2. Home Made leverage is not a perfect substitute for corporate leverage. If the firm borrows, the risk to the shareholder is limited to his shareholding in that company. But if he borrows personally, the liability will be extended to his personal property also. Hence, the assumption that personal or home made leverage is a perfect substitute for corporate leverage is not valid.
- 3. The assumption that transaction costs do not exist is not valid because these costs are necessarily involved in buying and selling securities.
- 4. The working of arbitrage is affected by institutional restrictions, because the institutional investors are not allowed to practisce home made leverage.

5. The major limitation of M-M hypothesis is the existence of corporate taxes. Since the interest charges are tax deductible, a levered firm will have a lower cost of debt due to tax advantage when taxes exist.

8.5.4. M-M Hypothesis Corporate Taxes

Modigliani and Miller later recognised the importance of the existence of corporate taxes. Accordingly, they agreed that the value of the firm will increase or the cost of capital will decrease with the use of debt due to tax deductibility of interest charges. Thus, the optimum capital structure can be achieved by maximising debt component in the capital structure.

According to this approach, value of a firm can be calculated as follows:

Value of Unlevered firm
$$(V_U) = \frac{EBIT}{K_O} (I - t)$$

Value of Levered firm $(V_L) = V_U + Dt$

Where, EBIT = Earnings before interest and taxes

 K_0 = Overall cost of capital

D = Value of debt capital

t = Tax rate.

8.6 Summary

Capital structure refers to the long - term sources of funds employed by a firm. The planning and designing of an appropriate capital structure is not an easy task. It depends upon a number of factors such as EBIT - EPS analysis, growth and stability of sales, cost of capital, cash flow ability of the firm, flexibility, etc.

An optimum capital structure is that combination of debt and equity which maximises the value of the firm or minimises the cost of capital. But, the existence of an optimum capital structure is not accepted by all. Hence, several theories of capital structure have been developed. As per the Net Income approach and the traditional view, capital structure influences the value of the firm and the cost of capital and hence there is an optimum capital structure. On the other hand, according to the Net operating Income approach and M M Hypothesis, capital structure has no relevance, and it does not influence the value of the firm and the cost of capital.

Modigliani and Miller supported their conclusions with the help of arbitrage process. However, they later realised the importance of the existence of corporate taxes and accepted that capital structure influences the value of the firm and cost of capital.

8.7 Key words

Capital Structure: Capital structure refers to the long - term sources of finance of a firm.

Financial Leverage: Employment of debt capital in the capital structure of a firm for the benefit of equity shareholders. Also known as trading on equity.

Financial Risk: The uncertainty about the future earnings of equity shareholders due to the use of debt capital by a firm.

Arbitrage: The process of switching of investment from higher - valued firm to lower - valued firm that results in equilibrium of the value of the two firms.

Personal or Home - Made Leverage: The use of debt by investors for arbitrage.

8. 8 Self assessment Questions

- 1. What is meant by capital structure? Explain the features of an appropriate capital structure.
- 2. What do you understand by capital structure? Explain the major determinants of capital structure.
- 3. Explain Net Income (NI) and Net Operating Income (NO I) approachs.
- 4. What is the Traditional View on capital structure?
- 5. Critically examine the Modigliani Miller Hypothesis of capital structure.
- 6. What is M M hypothesis capital structure? Does it make any difference if corporate taxesexist?
- 7. What is arbitrage? How does it work?

8.9 Further Readings

Van Horne, James C

Financial Management

Pandey I. M.

Financial Management

Prasanna Chandra

Financial Management