Lesson - 7

CAPITAL STRUCTURE THORIES

7.0 Objective :

After studying this lesson you will be able to know the:

* concept of capital structure and its significance,
* major determinants of capital structure of a firm
* various theories of capital structure

STRUCTURE

7.1 Introduction

7.2 Features of Capital structure

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7.1 Introduction

A firm needs funds for financing various requirements both long – term and short term requirements. The required funds are arranged through different sources both short - term and long – term and in various forms. The long - term funds are mobilized through equity shares, preference shares, retained earnings, debentures and bonds. A mix of various long - term sources of funds employed by a firm' is called capital structure. In this lesson, we will discuss the meaning of capital structure, determinants of capital structure and various theories that explain the relationship between the capital structure and cost of capital and in turn on value of the firm.

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

7.1.1 Financial Structure

Some authors use capital structure and financial structure interchangeably, but, both are different concepts. The 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 liabilities Thus, financial structure is a broader one and capital structure is only a part of it.

7.2 Features of Capital structure

It is the duty of the financial manager to design the 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 optimal 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 to the shareholders. It should maximize the earnings per share while minimizing the cost of financing.

ii) Solvency: The excessive use of debt proportion in the total capital structure threatens the solvency of the company. Therefore, the debt capital should be employed up to such a level that the financial risk is within manageable limits.

iii) Flexibility: The capital structure should be flexible enough to meet the changing conditions of the firm, which will 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 the debt capacity of the firm. The debt capacity of the firm depends on its ability to generate enough future cash flows for meeting interest obligations 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.

The above mentioned are the general features of an optimal capital structure. The relative importance of these features may differ from company to company. 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.

7.3 Determinants of Capital structure

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

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 increases the earnings per share (EPS) as long as the return on investment (ROI) is more than the cost of debt. But the leverage effect is more pronounced in case of debt because of two reasons:

i) cost of debt is usually lower than the other forms of capital, and

ii) the interest paid on debt is tax deductible.

The financial leverage is one of the important considerations, because of these reasons 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 an important tool in the hands of the financial manager to get an insight into the firm's capital structure planning. Therefore, one should analyze the possible changes in EBIT and their impact on the EPS under different financing plans. In case of favorable conditions, the financial leverage increases the EPS; however, it can also increase the financial risk to the shareholders. Therefore, a firm should employ debt to such an extent that the financial risk does not spoil the leverage effect.

ii) Stability and growth of sales

This is another important factor which influences the capital structure of a firm. The steadiness in sales ensures stable earnings, so that the firm will not face any difficulty in meeting its fixed obligations, viz., interest payment and repayment of debt, so that it can raise a higher amount of debt. In the same way, the rate of growth in sales also affects the capital structure decision. Usually, higher the rate of growth in sales, greater can be the use of debt in the financing the 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 also one of the important factors that should be kept in mind while designing the capital structure of a firm. Of all the sources of capital, equity capital is the costliest as the equity shareholders bear the highest amount risk. On the other hand, debt capital is the cheapest source of capital, because the interest on debt capital is tax deductible, which makes the debt capital cheaper when compared to other forms of capital. Preference share capital is also cheaper than equity capital as the dividends are paid at a fixed rate on preference shares. Since, the overall cost of capital is the aggregation of all specific cost of capitals, the capital structure should be designed carefully so that over all cost of capital is minimized.

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. Therefore, the calculations of fixed charges coverage and interest coverage ratios are relevant for this purpose.

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 the equity shares are issued for raising funds, the control of the existing shareholders is diluted, hence, they may raise the funds by issuing fixed charge bearing debt and preference share capital, as preference shareholders and debt holders do not have any voting right. The debt financing is advisable from the point of view of control, but excessive dependence 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. 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 economize 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. Thus, the capital structure should be flexible enough to raise additional funds whenever required, without much delay and cost

vii) Size of the firm

The size of the firm influences the design of capital structure of a firm. The small companies find it very difficult to mobilize long - term debt, as they have to prepare to pay higher rate of interest and with inconvenient terms. Hence, small firms make their capital structure very rigid and they have to depend more on equity capital and retained earnings for their requirements. Hence, the small firms for sometimes limit the growth of their business and any additional fund requirements met through by issuing equity or retained earnings only.

viii) Marketability and Timing

Capital market conditions are not changed 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 situations into consideration. In the case of depressed conditions, 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 mobilize the funds by issuing equity shares. The internal conditions of a firm may determine the marketability of securities. For example, a highly levered firm may find it difficult to raise additional debt.

ix) Floatation costs

Though this is not a very significant factor in the determination of capital structure, but these costs are incurred when the funds are raised externally. They include cost of the issue of prospectus, brokerage, commissions, etc. Generally, the floatation costs are less in case of debt rising rather than equity issue, which causes a temptation for debt capital. 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.

x) Purpose of funds:

The purpose for which funds are raised should also be considered while determining the capital structure. If the funds are raised for productive purpose, debt capital is more 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 restrictions:

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 the capital structure decisions should be made.

7.4 Optimum Capital structure

As it was discussed there are several factors determining the capital structure panning of a firm, the financial manager should aim at achieving an optimum capital structure. An optimum capital structure may be defined as that combination of debt and equity that maximizes the total value of the firm or minimizes the cost of capital. The capital structure of a firm influences its cost of capital and the value of the firm. 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.

7.5 Theories on Capital structure

The existence of the optimum capital structure is not accepted by all financial experts. There are two extreme views on the existence of the optimum capital structure. As per one school of thought the 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 in the theory of business finance. The main contributors to these theories are David Durand, Ezra Solomon, Modigliani and Miller. The following are the important theories on capital structure, which are discussed as under:

i) Net Income Approach
ii) Net Operating Income Approach
iii) The Traditional view
iv) Modigliani and Miller hypothesis

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:

Assumptions:

i) Firms employ only debt and equity capitals.

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 the 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 is relaxed later.

The following definitions are used in order to explain the capital structure theories:

S = market value of equity shares

D = market value of debt

V = S + D = market value of the firm

NOI = X - expected net operating income, i.e., earnings before interest and taxes.

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

7.5.1. Net Income Approach:

The net income approach was developed by David Durand, which says capital structure has relevance, and a firm can increase the value of the firm and minimize the cost of capital by employing debt in its capital structure. According to this theory, greater the debt capital employed lower will 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 the cost of equity.

ii) The risk perception of investors is not affected by the use of debt, as a result, the equity capitalization rate (k_e) and the debt – capitalization rate (k_d) don't change with leverage.

iii) There are no corporate taxes.

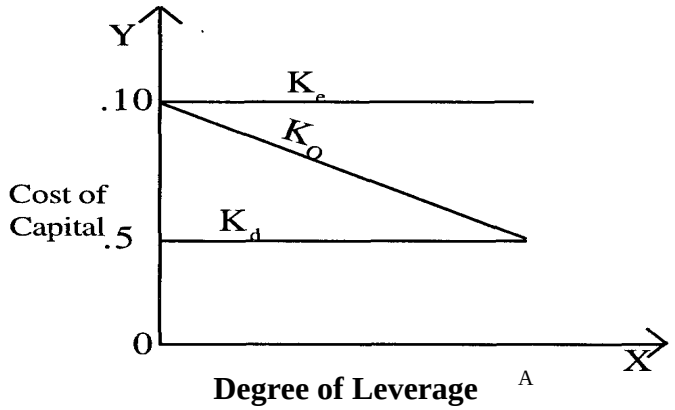
As per the above assumptions, cost of debt is cheaper than the cost of equity and they remain constant irrespective of the degree of leverage. If more debt capital is used because of its relative cheapens, the overall cost of capital declines and the value of the firm increases.

According to this approach: $V = S + D$

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

$$Ko = \text{Overall Cost of Capital} = \frac{EBIT}{V}$$

Figure 7.1: NI Approach



It is evident from the Figure 7.1 that when degree of leverage is zero (i.e. no debt capital employed), overall cost of capital is equal to cost of equity (ko = ke). When the debt capital is employed further and further, which is relatively cheaper compared to the cost of equity, the overall cost of capital declines, and it becomes equal to cost of debt (kd,) when leverage is one (i.e. the firm is fully debt financed). Thus, according to this approach, the firm's capital structure will be optimum, when degree of leverage is one.

7.5.2. Net Operating Income Approach:

The net operating income (NO I) approach is also suggested by David Durand, which is another extreme view on the capital structure and value of the firm. As per this approach 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:

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

Ko is the overall cost of capital and depends on the business risk of the firm, which is not affected by the capital mix.

The following are the critical assumptions of this theory:

1. The market capitalizes the value of the firm as a whole and the split between debt and equity is not important.
2. The business risk remains constant at every level of debt - equity mix.
3 There are no corporate taxes.
4. The debt capitalization rate (Kd) is constant

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

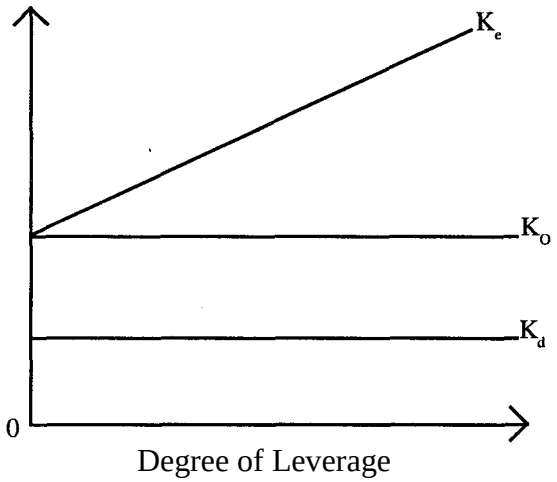


Figure 7.2: NOI Approach:

Figure 7.2 depicts that Ko and Kd are constant and Ke increases with leverage continuously. The increase in cost of equity (Ko) exactly offsets the advantage of low cost debt, so that overall cost of capital (Ko) remains constant, at every degree of leverage. This implies that every capital structure is optimum and there is no unique optimum capital structure.

7.5.3. Traditional view

This Traditional approach is also known as intermediate approach, which has been popularized by Ezra Solomon. It is a compromise view between the two extremes of net income approach and net operating income approach. According to this approach, the 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 explains that the cost of capital declines with an increase of debt capital up to a reasonable level, and after that it increases with a further rise in debt capital. Thus, the traditional theory on the relationship between the capital structure and the value of the firm has three stages, which are discussed as under:

First Stage: Increasing Value:

In this first stage, the cost of equity (Ke) and the cost of debt (Kd) are constant and cost of debt is less than cost of equity. The employment of debt capital up to a reasonable level will cause the overall cost of capital to decline due to the low cost advantage of debt. As a result, the Ko decreases with increasing leverage, and thus, the total value of the firm, V, also increases.

Second Stage**:** Optimum Value

Once the firm has reached a certain degree 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 capital increases the risk to equity shareholders that leads to a rise in Ke. This rise in Ke exactly offsets the low - cost advantage of debt capital so that the overall cost of capital(Ko) remains constant, which maximize the value of the firm..

Third Stage: Declining Value

If the firm involves the debt capital beyond an acceptable level, it will cause an increase in risk to both equity shareholders and debt - holders, because of which both cost of equity (Ke) and cost of debt (Kd) start rising in this stage, which will in turn cause an increase in the overall cost of capital (Ko).

It can be inferred from the foregoing discussion that the cost of capital (Ko) is a function of leverage. The cost of capital declines and the value of the firm increases with a rise in debt capital up to a certain level and beyond this level, the overall cost of capital *(Ko)* tends to rise and as a result the value of the firm will decline, which is shown in Figure 7.3.

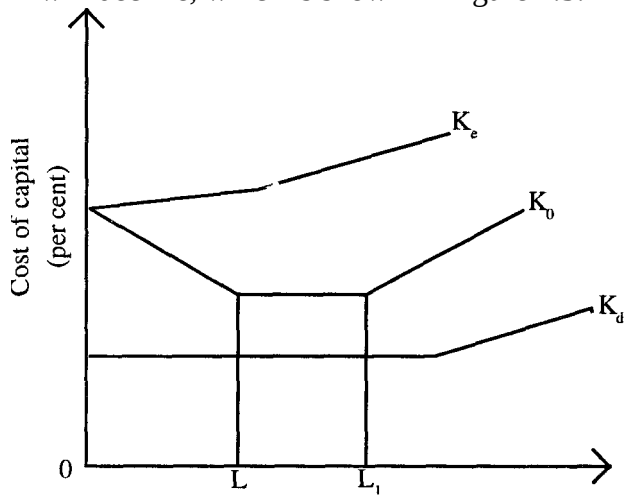


Figure 7.3: Traditional view

It is evident from Figure 7.3 that the overall cost of capital declines with an increase in leverage up to point L and it increases with rise in the leverage after point L1 and hence, the optimum capital structure lies in between L and L1.

Criticism on Traditional view**:**

The traditional view on capital structure supports that investors value levered firm more than unleveled firm, which means that they pay a premium for the shares of levered firm. Here, there is no sufficient justification for the assumption that investors' perception about risk of leverage is different at different levels of leverage.

7.5.4. Modigliani - Miller (MM) Hypothesis:

The Modigliani - Miller hypothesis do not agree with the traditional view. Modigliani and Miller argued that, in the absence of taxes and transaction costs 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. The M and M hypotheses can be best explained in terms of their two propositions.

7.5.5 Assumptions of the M & M Hypothesis:

The M M's Proposition I is based on certain asssuptions, which are relate to the behavior of the investors , capital markets and the tax environment of the country. They are:

(i) There is a perfect capital market, where in

(a) the investors are free to buy and sell securities,

(b) they can borrow funds without restriction at the same terms as the firms do,

(c) they behave rationally,

(d) they are well informed, and

(e) there are no transaction costs

(ii) Firms can be classified into homogeneous risk classes, i.e., the same risk class will have the same degree of financial risk.

(iii) All investors have the same expectation of a firm's net operating income (EBIT).

(iv) The dividend payout ratio is 100%, which means there are no retained earnings.

(v) There are no corporate taxes. This assumption has been removed later.

Proposition I:

The overall cost of capital (Ko) and the value of the firm are independent of the capital structure. The total market value of the firm is given by capitalizing the expected net operating income by the rate appropriate for that risk class.

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 capitalizing the net operating income by the rate appropriate to that risk class. Proposition I can be expressed as follows:

$$V = S + D = \frac{X}{Ko} = \frac{NOI}{Ko}$$

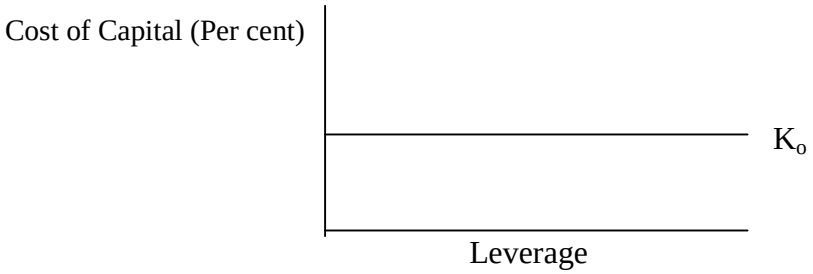
Where, V = the market value of the firm
S = the market value of equity
D = the market value of debt
x = the expected net operating income (EBIT)
K = the capitalization rate appropriate to the risk class of the firm.

According to the proposition I, the average cost of capital (Ko) is not affected by the degree of leverage and is determined as:

$$Ko = \frac{X}{V}$$

According to M-M, the average cost of capital is constant as shown in the following Figure: 7.4

Figure 7.4 :Average Cost of capital



Arbitrage Process:

According to M-M, the simple logic of Proposition I is that two firms with identical in all respects except their capital structure, cannot have different market values or different cost of capitals. In case, if 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 the market values are different, so that the investors will try to take an 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 of both the firms. Therefore, the M and M argued that there is no possibility of different market values for identical firms.

The arbitrage process also works in the reverse direction. Leverage has neither advantage nor disadvantage. If the unlevered firm has higher market value than a levered firm, the arbitrage process works in reverse direction, where in the investors will try to switch their investments from unlevered firm to levered firm so that equilibrium is established in no time.

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

Proposition II

The financial risk increases with more debt component in the capital structure, as a result the cost of equity (Ke) increases in a manner to offset exactly the low - cost advantage of debt and hence, the overall cost of capital (Ko) remains the same

M-M's proposition II defines cost of equity as for any firm in a given risk class, it is equal to the constant average cost of capital (Ko) 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 explained as:

$Ke = Ko + (Ko - Kd)D/S$

Where, Ke = cost of equity

D/S = debt - equity ratio

M-M argue that Ko 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 the increased risk to equity shareholders. The crucial part of the M-M hypotheses 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 Ko. At this context, the M and M advocates that Ke 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 debt holders and hence, the Ke remains constant. This is illustrated in the Figure 7.5 given below:

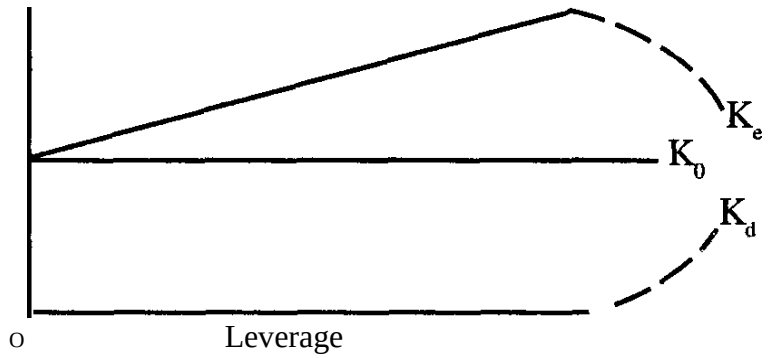


Figure 7.5 : M & M Hypothesis and Cost of capital

7.5.6 Criticism on M & M Hypothesis:

The arbitrage process is the behavioral and operational foundation for the M & M Hypothesis, which fails to bring the desired equilibrium because of the following limitations.

(a) 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.

(b) Another criticism is that the 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 but whereas, if he borrows personally, the liability will be extended to his personal property also. Hence, the assumption of home - made leverage is a perfect substitute for corporate leverage is not valid.

(c) The assumption of transaction costs do not exist is impracticable because these costs are necessarily involved in buying and selling of securities.

(d) The working of arbitrage is affected by institutional restrictions, because the institutional investors are not allowed to practice home - made leverage.

(e) The major limitation of M-M hypothesis is the existence of corporate taxes, which are tax deductible and hence, a levered firm will have a lower cost of debt due to tax advantage when taxes exist.

7.5.7 M-M Hypothesis Corporate Taxes

Modigliani and Miller later recognized 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 decline with the use of debt capital in the capital structure due to tax deductibility of interest charges. Thus, the optimum capital structure can be obtained by increasing the debt component in the capital structure of the firm. According to this approach, the value of a firm can be calculated as follows:

$$\text{Value of Unlevered firm (Vu)} = \frac{\text{EBIT}}{\text{Ko}} (I - t)$$

Value of Levered firm (VL) = Vu + Dt

Where, EBIT = Earnings Before Interest and Taxes

Ko = Overall cost of capital

D = Value of debt capital

t = Tax rate.

7.6 Summary

Capital structure decision of a firm can be characterized as a choice of that combination of debt and equity, which maximizes the value of a firm or minimization of overall cost of capital. 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.

The existence of an optimum capital structure is not accepted by all and there 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 argument of irrelevancy between the capital structure and the cost of capital with the help of arbitrage process based on certain assumptions. However, they later realized the importance of the existence of corporate taxes and accepted that the capital structure influences the value of the firm and cost of capital.

7.7 Keywords

1. **Capital Structure:** Capital structure refers to the long - term sources of finance of a firm.
2. **Financial Leverage:** Employment of debt capital in the capital structure of a firm for the benefit of equity shareholders and it is also known as trading on equity.
3. **Financial Risk:** The uncertainty about the future earnings of equity shareholders due to the use of debt capital by a firm.
4. **Arbitrage:** The process of switching of investment from higher - valued firm to lower - value firm that results in equilibrium of the value of the two firms.
5. **Personal or Home - Made Leverage:** The use of debt by investors for arbitrage.

7.8 Self Assessment Questions

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

7.9 Further Readings:

1. Prasanna Chandra, Financial Management
2. James C. Van Horne: Financial Management
3. Khan and Jain: Financial Management
4. Pandey l.M: Financial Management

KSNR