**CHAPTER: 4**

**ANALYSIS OF STUDY OF THERIOS OF CAPITAL STRUCTURE**

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CHAPTER: 4

ANALYSIS OF STUDY OF THEORIES OF CAPITAL STRUCTURE

Different theories of capital structure have been propounded by many experts. All theories discuss the impact of decision taken by management of the company about debt-equity mix on the cost of capital and market value of the firm. In this chapter, various theories of capital structure are studied. The main concept behind all the theories of capital structure is whether the optimum capital structure and maximum market value of the firm is possible or not and if it possible, how it can be achieved by the mix of equity and debt. There are mixed opinions among the experts regarding the optimum Capital Structure. All these viewpoints are discussed after discussing the meaning of capital structure and the impact of financial leverage on Earning Per Share (EPS) and Return on Equity (ROE), which are central to all theories of capital structure.

4.1 MEANING OF CAPITAL STRUCTURE

There are three main decisions of financial management of any business firm namely investing decision, financing decision and dividend decision. After finalizing the investing decision to implement a project, the next step is to arrange the required capital for the project. Capital structure is a decision relating to arrangement of required capital through long term instruments i.e. debt or equity. The composition of long term financing in the form of equity, debt and retained earnings is known as capital structure. If the short-term sources of funds are also included in the financing decision for short-term requirement of capital, it is known as financial structure. Thus, the entire liabilities side of balance sheet represents the financial structure and if the short-term borrowings are excluded from the various long term as well as short terms means of financing, it is known as Capital Structure. As per Pandey (2005), “The term capital structure is used to represent the proportionate relationship between debts and equity. Equity includes paid-up share capital, share premium and reserves and surplus”.
4.2 COMPONENTS OF CAPITAL STRUCTURE

The decision to design the capital structure becomes more complicated as various options are available to raise funds and each option has its own distinct features. Hence, a firm has to take decision of proportion of equity and debt after considering its implications on financial performance of the firm and on the interest of all stakeholders. Therefore, the most crucial decision for any company is the formation of its appropriate capital structure. The optimum capital structure of a company helps the management to achieve its ultimate objectives of minimizing overall cost of capital and maximizing profitability, earning per share and market value of the firm. Excessive use of debt, affects the survival of the corporate firm whereas a conservative policy deprives the firm from achieving maximum rate of return to shareholders.

As the capital structure is the mixture of debt and equity and its mixture decides the overall cost of capital, which leads the firm towards optimum capital structure. The main components of capital structure are equity and debt. Other factors, which are closely associated with the decision of capital structure, are operating leverage, financial leverage, Earning Per Share (EPS), Return on Equity (ROE), cost of equity, cost of debt and overall cost of capital.

Equity refers to the owners’ stake in the business. In a company form of business organization, the shareholders are the real owners. Therefore, monetary value of right of shareholders in the company is known as equity. Hence, equity includes equity share capital, preference share capital and retained earnings. Equity is also called as net worth. The types of shares, equity and preference and retained earnings are explained in the chapter of sources of funds.

Debt refers to the claim of fund providers other than shareholders. Hence, debt is the outsiders’ stake in a business, which is provided for a fixed term at some fixed rate of interest. Thus, debt is purely a financial obligation for a company, which has to be served obligatorily in terms of payment of interest as well as the redemption of principal amount as per the terms and conditions of borrowing agreement. Therefore, the interest paid for using the debt in the business is a deductible expense from the income to calculate the taxable profit. Thus, the payment of interest reduces the tax liability, which is popularly known as “Tax Shield”. The use of fixed interest bearing securities in the capital
structure is known as financial leverage. There are various forms of debt like debentures, loan, bonds, commercial borrowings, commercial papers, public deposits etc.

The components of capital structure are discussed in following sections:

4.2.1 Earning Per Share (EPS)

Earning Per Share (EPS) refers to the profit available per equity share issued by the company after the payment of all third party dues including tax and dividend on preference shares. Thus, earning per share is derived by dividing the number of equity shares to the profit available for equity shareholders, i.e.

$$\text{EPS} = \frac{\text{Profit for equity shareholders}}{\text{No.of equity shares}}$$

4.2.2 Return on Equity (ROE)

Return on Equity (ROE) is the other form of earning per share. Return on equity is defined as the rate of return on equity share capital. Therefore,

$$\text{ROE} = \frac{\text{Profit for equity shareholders}}{\text{Paid-up equity share capital}} \times 100$$

4.2.3 Cost of Capital

As the main sources of capital are equity shares, preference shares, retained earnings and debt, the cost of capital consists of the cost of equity share capital, cost of preference share capital, cost of retained earning and cost of debt.

As per Kishore (2004), “The cost of capital is the rate of return the company, which the company has to pay to various suppliers of funds to the company”.

The cost of capital has two aspects namely, over all cost of capital and weighted average cost of capital. The combined cost of each component of capital without giving any weight to particular source of fund is called as “Over all cost of capital (Ko)” and if the combined cost is calculated by assigning the weights to respective cost of different sources of funds, it is called as “Weighted Average Cost of Capital (WACC)”
4.2.4 Cost of equity share

The cost of equity share includes the discount offered to equity shareholders and flotation cost incurred at the time of issue of equity share capital. Kishore (2004), defined the cost of equity as “The minimum rate of return that a company must earn on the equity financed portion of an investment project so that the market price of the shares remain unchanged”

4.2.5 Cost of preference share

Preference shares involve fixed rate of dividend, flotation cost, discount on issue and premium payable on redemption if any as its cost. As per Kishore (2004), cost of preference shares is “The rate of return that must be earned on preference capital financed investments, to keep unchanged the earnings available to the equity shareholders”

4.2.6 Cost of retained earning

Retained earnings are the profit not distributed as dividend to equity shareholders accumulated over the years in the company. The retained earning is available for further profitable investment opportunities. If it is not utilized to earn some profit in the business, the potential earning is lost by the firm. Hence, cost of retained earning is the opportunity cost of capital.

4.2.7 Cost of debt

A company may raise the debt by borrowing from financial institutions or public at fixed contractual rate of interest. It is acknowledged as debt in the form of debentures or bonds or deposits at some fixed coupon rate of interest. It also involves flotation cost, discount at the time of issue and premium payable at the time of redemption.

The factors affecting the cost of capital may be different for each source of fund and therefore the cost of capital also differs from source of fund to source of fund. Generally, the cost of retained earnings is the least followed by debt, preference shares and equity shares.
4.3 RELATIONSHIP BETWEEN COMPONENTS OF CAPITAL STRUCTURE

The relationship between two components of capital structure i.e. equity and debt is established when both sources are used in the capital structure and their different proportion in capital structure creates considerable impact on cost of capital, earning of share holders, market price of shares and value of the firm. Therefore the relationship between components of capital structure occupies a key position in theories of capital structure. This relationship between components of capital structure is known as leverage. There are two kind of leverage, that arise in the business. One affects the profitability of the firm which is known as operating leverage and the other affects the surplus of profit available for equity shares holders; which is known as financial leverage.

4.3.1 Operating Leverage

The profitability and cost of capital are affected by the expenses; a firm has to incur in order to carry out its activities. The expenses can be broadly classified into operating expenses and financial expenses.

The operating expenses are related to day-to-day activities of the firm like material, labor, factory, office and sales expenses whereas financial expenses are related to the cost of borrowing the debt like floatation cost and interest payable on it over the period of its use. Some of the operating expenses are variable based on the level of operation and some are fixed on the basis of period, whereas all financial expenses are fixed. The variability of expenses has a vital impact on EPS. As fixed expenses do not change in the same direction and proportion with the change in sales, a small change in the level of sales will have significant effect on EPS and ROE if the firm has resorted to the use the operating fixed expenses. The existence of operating fixed expenses in a business is called as operating leverage.

4.3.2 Financial Leverage

The other fixed expense relates to the interest payable on debt at fixed rate. The obligation of payment of interest is called as financial expense. As financial expense is also considered as a deductible expense like operating expenses from earnings for calculating taxable profit, it reduces the tax liability and increases the profit available for shareholders. Over and above the tax advantage, the firm can take other advantage in
favor of shareholders by earning higher return on investment made in the business than the rate of interest payable on debt resulting into higher EPS and ROE. The reduction in tax liability due to use of debt in a capital structure and earning more return for shareholders encourage the firms to introduce debt in their capital structure. The use of debt in the capital structure is called as financial leverage.

As the question of operating leverage is a part of operating decision and does not relate with the financing decision the capital structure has no direct relationship with the operating leverage, the decision of capital structure is based on financial leverage and hence all theories of capital structure concentrate on financial leverage only.

4.4 THEORIES OF CAPITAL STRUCTURE

All companies should have well defined Capital Structure policy, otherwise it may face problem of raising fund and financing the projects for the long run. An appropriate capital structure decision may improve the value as well as the solvency of the firm. There are two opposite effects of existence of debt in the capital structure. The over all cost of capital may reduce as the proportion of debt increases in the capital structure because cost of debt is less than cost of equity, while on the other hand risk of the firm increases with the increase in the fixed contractual obligation, which again increases the weighted average cost of capital. However, the experts differ on the view of effect of financial leverage on the value of the firm due to the distinct feature of debt attached with the return for shareholders and risk involved with it.

Various theories of capital structure have been propounded to explain the relationship between market value of the firm and its capital structure decision. There is unanimity in the opinion that the capital structure should be optimum. It is said theoretically that optimum capital structure implies a ratio of debt and equity at which weighted average cost of capital is minimum and the market value of the firm is maximum. However, there is no unanimity about which kind of capital structure is optimum. In practice, planning an optimum capital structure is the most difficult task as the decision is influenced by varies factors like attitude of management, situation of capital market, guidelines issued by regulatory authorities, terms and conditions of financing institutions, cost of debt, rate of return on investment, tax shield on debt and operating expenses, existing capital structure, pay out policy, growth opportunities, size of the firm, nature of business, profitability, liquidity, rate of corporate tax, prevailing rate of interest, earning volatility,
These factors are highly psychological, conflicting, complex, and qualitative in nature and sometimes beyond control also. One viewpoint is that, if there is change in the proportion of components of Capital Structure, it will affect earning per share and also the value of the firm while another view argues that the financing mix or combination of debt and equity has no impact on the value of the firm and on shareholders' wealth. There is nothing like optimum Capital Structure. The other distinct view emphasizes on the agency which takes the decision of capital structure creates the vital impact on the blend of equity and debt for financing a project. On the basis of different viewpoints different theories of capital structure have been propounded over a period of time.

These theories can be classified into different groups on the basis of their focus. For the present discussion, the theories are segregated into the following groups:

- Net Income Approach
- Net Operating Income (NOI) Approach
- Traditional Approach
- Modigliani Miller (MM) Approach
- MM hypothesis under Corporate Taxes
- Miller's Model under Corporate Taxes and personal taxes
- The Trade–Off Theory: Cost of Financial Distress and Agency Cost
- Pecking Order Theory

4.5 NET INCOME APPROACH

This approach has been propounded by Durand David in 1959 (Pandey, 2005). According to this approach, the market value of equity shares is based on the earning available for equity shareholders after the payment of interest on debt if it is included in the Capital Structure. The earning of the firm after the payment of all other expenses except interest on debt is called Net Operating Income (NOI) and the earning available for equity shareholders after the payment of interest is called as “Net Income (NI). Therefore, Net Income = Net Operating Income (NOI) – Interest on debt (I).

As per the preposition of this theory, the market value of equity shares is decided on the basis of net income available for equity shareholders and hence, this theory is called as NI approach. The market value of the firm is decided by adding the market value of debt
to the market value of equity shares. As the net income and cost of capital differs with
the use of debt in Capital Structure, the market value of the equity shares also changes
accordingly. This phenomenon ultimately changes the market value of the firm and
hence; as per this approach, capital structure decision becomes relevant to the valuation
to the firm. In other words, a change in the capital structure brings a corresponding
change in the overall cost of capital as well the total value of the firm.

According to this approach, as the debt increases, overall or weighted average cost of
capital decreases and vice versa. Therefore increase in debt results in the increase in the
value of the firm and consequently increases the value of the equity shares of the
company.

Net Income approach is based on the following three assumptions:

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

As per this approach, the firms try to optimize the capital structure by introducing more
and more debt having less cost than equity in the capital structure. Therefore, when the
financial leverage is increased the proportion of cheaper source of funds i.e. debt
increases and overall cost of capital declines which consequently increases the market
value of the firm and also the value of the equity share of the firm. Hence, the optimum
capital structure exists when the firm employs 100% debt or maximum debt in the capital
structure.

According to this approach, the value of the firm and the value of equity are determined
as under.
Market Value of the firm \((V) = \) Market value of equity \((E) + \) Market value of debt \((D)\)

\[
\text{Market value of Equity } (E) = \frac{NI}{Ke}
\]

\[
\text{Market Value of Debt } (D) = \frac{I}{Kd}
\]

Where,

\(NI\) = Net income available for equity share holders i.e. NOI-I

\(NOI\) = Net Operating Income

\(I\) = Interest on debt

\(Ke\) = Rate of equity capitalization (Cost of Equity)

\(Kd\) = Rate of debt capitalization (Cost of Debt)

Cost of Capital \((Ko)\) or Weighted Average Cost of Capital \((WACC)\)

\[
\frac{Ko}{WACC} = \frac{\text{Net Operating Income } (NOI)}{\text{Market Value of the firm } (V)}
\]

Degree of Financial Leverage = \[
\frac{\text{Market Value of Debt } (D)}{\text{Market Value of firm } (V)}
\]

The effect of leverage on the cost of capital under NI approach is explained by diagram 4.1.

Diagram: 4.1 shows the effect of leverage on the cost of capital under NI approach.
From the diagram 4.1, it is clear that as the debt is replaced by equity in the capital structure the weighted average cost of capital (Ko) decreases. The WACC decreases because the debt is cheaper than the equity and therefore as the debt increases and equity reduces, the funds having less cost is replaced by the funds having more cost.

**Optimum Capital Structure under NI Approach**

The capital structure is said to be optimum at that stage of debt-equity mix where the overall cost of capital is minimum. As per this approach, the cost of capital is minimum at 100% level of debt, therefore the capital structure is optimized at the 100% debt level.

**Criticisms of NI Approach**

However, NI approach takes into consideration the earning available for equity shareholders for calculating the market value of equity shares, it is more realistic and reflects the impact of financial leverage on market value of the firm, it suffers from some drawbacks. The NI approach is criticized on following grounds:
(i) The assumption of constant cost of debt at any level of debt is not correct. The funds providers insist for more rate of interest above certain level of debt.

(ii) The assumption of risk perception of equity share holders is also not correct. As the debt increases the financial risk also increases and equity share holders will expect more return on their investment and hence the rate equity capitalization also increases with the increase in financial leverage.

(iii) 100% dividend payout and absence of corporate tax are not practically possible.

4.6 **NET OPERATING INCOME (NOI) APPROACH**

This theory was also developed by David Durand (Pandey 2005). He probably realized the shortcomings of NI Approach and therefore, he modified the NI approach to NOI approach.

As per this approach, the market value of the firm is based on the earning available for fund providers after paying all other expenses except interest on debt. The profit available for funds providers or for calculating the market value of the firm is called Net operating Income (NOI).

This theory is just opposite to NI approach. NI approach is relevant to capital structure decision. It means decision of debt equity mix does affect the WACC and value of the firm. As per NOI approach the capital structure decision is irrelevant and the degree of financial leverage does not affect the WACC and market value of the firm. NOI approach evaluates the cost of capital and therefore the optimal Capital Structure on the basis of operating leverage by means of NOI approach.

The NOI approach is based on following assumptions:

(i) There are no corporate taxes.

(ii) Cost of debt remains constant at all level of debt.

(iii) Overall cost of capital remains constant.

(iv) Value of the firm depends on expected net operating income and overall capitalization rate or the opportunity cost of capital.

(v) Net operating income of the firm is not affected by the degree of financial leverage.
The operating risk or business risk does not change with the change in debt equity mix.

WACC does not change with the change in financial leverage.

The NOI approach is based on two prepositions.

**Preposition I**

As per NOI approach, the value of firm depends on the earning and business risk rather than the financial risk to finance the assets arising out of financial leverage. As per this proposition the market value of the firm is calculated by capitalizing the net operating income and not the Net Income, hence it is called as NOI approach.

Under NOI approach the market value of the firm is calculated by dividing the Net Operating Income by the overall cost of capital i.e. by capitalizing the NOI.

Therefore, Market value of the firm \( V = \frac{\text{Net Operating Income (NOI)}}{\text{Market value of the firm (V)}} \)

Under the core preposition of NOI approach, the overall cost of capital depends on the business risk of the firm, and business risk does not change with change in debt equity mix, hence overall cost of capital remains constant.

**Preposition II**

As per NOI approach, even if the firm uses more and more debt in the capital structure, the overall cost does not change even though the debt is cheaper than equity. This is because the equity share holders increase their expectations of return on their investment with every increase in debt resulting in increased business risk. Consequently, the benefit of cheaper debt is offset by higher expected rate of return on equity and therefore overall cost of capital remains constant.

This phenomenon is also shown in following diagram 4.2.
It is clear from the diagram 4.2 that with increase to financial leverage, the overall cost of capital (ko) and cost of debt (kd) remains at the same level but cost of equity increases with increase in financial leverage. This is because the expected rate of return on equity increases with the increase in financial risk in the business. Overall cost of capital remains constant because the benefit of low cost of debt is neutralized by increase in the cost of equity.
Optimum capital structure under NOI Approach:

As per NOI approach the cost of debt, market value of the firm and the market value of the equity shares remain constant irrespective of change in the financial leverage and the benefit of low cost of debt is offset by the increased rate of return on equity with the increase in debt in the capital structure. Therefore, the overall all cost of capital remains the same at any level of debt; hence, the capital structure is optimum at any level of debt-equity mix. Under the circumstances, the optimum level of capital structure composed on debt-equity composition becomes indeterminate, as the impact of financial leverage is counter balanced by a corresponding change in Ke in the opposite direction.

Criticisms of NOI approach

The NOI approach is criticized on the following grounds:

(i) The assumption of absence of corporate tax is not correct.
(ii) The cost of debt increases with the increase in the quantum of debt.
(iii) As the cost of debt increases with the increase in financial leverage, the overall cost of capital also increases with increase in financial leverage.
(iv) An investor values differently the firm having higher level of debt in its capital structure than the firm having less debt or no debt.

4.7 TRADITIONAL APPROACH

The traditional approach was propounded by Ezra Soloman in 1963 (Pandey, 2005). The traditional approach rejects both extreme prepositions of relevance approach of NI theory and irrelevance approach of NOI theory. This approach is the compromise between NI approach and NOI approach. This approach neither assumes constant cost of equity (ke) and declining Weighted Average Cost of Capital (WACC) like NI approach nor increasing cost of equity and constant cost of debt (kd) and over all cost of capital (ko) like NOI approach.

According to this approach weighted average cost of capital decreases only up to a certain level of financial leverage and starts increasing beyond certain level of judicious mix of debt and equity. Hence, a firm has an optimum capital structure when the weighted average cost of capital is minimum and the market value of the firm is maximum.
As per this approach, the weighted average cost of capital declines with moderate level of leverage because expensive equity is replaced by low cost of debt. However, this phenomenon does not last long since financial leverage increases risk to share holders and cost of equity. The traditional theory assumes that up to a certain level of debt, it remains cheaper than equity and beyond that level, it becomes costly. The increase in debt results in the decrease in weighted average cost of capital only up to a stage where benefit of low cost of debt is more than the increase in cost of equity due to increase in financial risk. It means the financial leverage is beneficial when cost of debt plus the increased cost of equity is less than the cost of equity that was before debt financing. The moment when cost of debt plus the increased cost of equity becomes higher than the cost of equity that existed before debt financing, the additional use of debt increases the weighted average cost of capital and the decision of increasing debt become unfavorable and the value of the firm declines.

**Three stage of capital structure under traditional approach**

According to traditional theory, the value of the firm may first increase with moderate leverage, reach the maximum value and then starts declining with higher financial leverage. This is because the weighted average cost of capital first decreases and after reaching the minimum, it starts increasing with increase in financial leverage. Thus, under traditional theory there are three stages of relationship between capital structure and the firm value.

**First Stage: Increasing Value**

In the first stage the cost of equity (ke) either remains constant or rises slightly with increase in debt. At this stage, the increase in cost of equity is less than the advantage in cost due to lower cost of debt than equity. During this stage, the cost of debt (kd) remains constant since, it is considered as a rational decision. Consequently, the overall cost of capital (ko) decreases with increase in leverage and thus the total value of the firm (V) also increases.

**Second Stage: Optimum Value**

At this stage, the cost of equity increases faster than it increases at the first stage when debt is increased. Further the benefit of low cost of debt is wiped off by increase in cost of equity beyond certain level, hence, the firm reaches at a stage of minimum weighted
average cost of capital and maximum value of the firm at certain level of debt equity mix where the optimum capital structure is attained.

Third Stage: Declining Value

As the debt is increased beyond certain level, the increase in cost of equity becomes greater than the advantage of low cost of debt and therefore weighted average cost of capital increases and the market value of the firm decreases.

At this stage, the value of the firm goes on declining with every increase in debt replacing the equity. This happens because investors perceive a higher degree of financial risk and demand a higher rate of return on equity, which exceeds the advantage of low cost debt.

These three stages are explained with the help of diagram 4.3 as under:

Diagram 4.3

Effect of Financial Leverage on Cost of Equity, Cost of Debt and Overall Cost of Capital under Traditional Approach
The cost of capital curve is convex to the x axis which shows that in the beginning when there is no debt or a little debt; the cost of capital is higher; as more debt is introduced it goes on declining and there is a specific point at which the cost of capital is minimum and after this point the cost of capital starts increasing with the introduction of more and more debt in the capital structure. As per this theory, the optimal Capital Structure would fall somewhere in the second stage.

**Optimum Capital Structure under Traditional Approach**

The supporters of traditional theory believe that overall cost of capital declines when the debt is used in capital structure and it is possible to attain optimum capital structure. The capital structure is optimum at the stage of debt-equity mix where the cost the over all cost of capital is minimum and the value of the firm is maximum.

**Criticisms of traditional Approach:**

The traditional theory is criticized on following grounds;

(i) The theory assumes that investors value the levered firms more than the unlevered firm is not practically correct.
(ii) Risk for shareholders does not increase with additional debt for financially sound firms.
(iii) Investor’s perception about risk of leverage does not change for the same firm at different levels of leverage.
(iv) Optimum capital structure is affected by tax deductibility of interest and other capital market factors, which are ignored.

**4.8 MODIGLIANI MILLER (MM) APPROACH**

In an article, “The Cost of Capital, Corporate Finance and theory of Investment”, published in American Economic Review, June 1958 (Pandey,2005), Modigliani and Miller propounded their view on optimum capital structure, which is popularly known as MM Approach. According to them cost of capital is independent of capital structure and financial leverage does not affect the overall cost of capital and hence there is no optimum capital structure. MM theory is just similar to NOI approach with a basic difference. The basic difference is that the NOI approach is purely a definitional term, explaining the concept without behavioral justification, whereas M.M. Approach provides behavioral justification in favor of the theory.
Assumptions:

M.M. Approach is based on certain assumptions, as under.

(i) Capital markets are perfect where individuals and companies can borrow unlimited funds at the same rate of interest.

(ii) Stock markets are perfectly competitive.

(iii) There is no corporate tax.

(iv) There is no transaction cost.

(v) Investors are free to buy and sell securities.

(vi) Investors behave rationally.

(vii) Dividend payout ratio is 100% and there are no retained earnings.

Prepositions of MM Approach

There are two basic prepositions of MM Approach:

Preposition I: The market value of any firm is independent of the proportion of debt equity mix.

Preposition II: Shareholders expect more and more return as debt equity ratio increases.

These prepositions can be explained as under:

Proposition I: Value of the levered and unlevered firm

As per this preposition, the value of the firm depends on the net operating income and business risk and not on the basis of financing pattern of assets. Hence, market value of the firm is independent of financial leverage. Therefore, total market value of all firms, levered or unlevered firms having the same business risk remains the same.

Under this preposition, value of the firm is calculated by capitalizing net operating income like NOI approach. It is assumed that net operating income and firm’s opportunity cost of capital (\(K_a\)) remain constant irrespective of use of financial leverage. Thus, the value of the firm is obtained by dividing Net Operating Income (NOI) with Opportunity cost of capital (\(K_a\)). For a levered firm debt holders’ income is interest and shareholders income is net income after payment of interest. For the unlevered firm, the entire net operating income is the shareholders’ net income. The net operating income of
firm does not change by introducing the debt, the risk perception of the investors also
does not change and therefore the value of levered firm and the unlevered firm remains
the same. Thus under this approach Value of levered firm (VI) = Value of un levered
firm (Vu).

Cost of capital of the levered firm and unlevered firm

As the levered firm’s value is the sum of the value of equity and value of debt, under this
proposition the levered firm’s expected rate of return is the ratio of the expected
operating income to the value of all securities. This is an average rate of return expected
by all security holders, which should be earned by the firm on its total investments. In a
levered firm, the average rate of return required by all securities-holders is the Weighted
Average Cost of Capital

Therefore WACC = Ko or Kl

The value of the levered firm (VI) = \(\frac{NOI}{Kl}\)

Overall cost of capital (Ko) or Kl = \(\frac{NOI}{VI}\)

Where,

\(NOI\) = Net Operating Income

\(Ka\) = opportunity cos

\(VI\) = value of levered firm

\(KL\) = levered firm’s cost of capital

\(Ko\) = Overall cost of capital

In case of the unlevered firm the entire income for shareholders is the net operating
income, its weighted average cost of capital or overall cost of capital of unlevered (Ku) is
equal to its opportunity cost of capital (Ka).

\(Ka = Ku = \frac{NOI}{Vu}\)
Where,

\[ \text{Ku} = \text{unlevered firm's cost of capital} \]

\[ \text{Vu} = \text{value of unlevered firm} \]

Since the values of the levered and unlevered firms and their net operating income do not change with the change in the financial leverage, the weighted average cost of capital for two firms, levered and unlevered in the same business risk will be the same and equal to the opportunity cost of capital.

Thus, levered firm's cost of capital \((\text{kl})\) = unlevered firm's cost of capital \((\text{Ku})\).

Therefore \(\text{Kl} = \text{Ko} = \text{ka} = \text{Ku}\)

This is explained with the help of the diagram 4.4 as under:

**Diagram 4.4**

**Effect of Financial leverage on Cost of Capital under MM Approach**

The diagram shows the irrelevance of cost of capital with change in the debt-equity mix. The financial leverage does not affect the values of levered and unlevered firm and the expected net operating income. Therefore, the weighted average cost of capital also would not change with the change in financial leverage. Hence, the weighted average
cost of capital for levered and unlevered firm will be equal to the opportunity cost of capital.

This phenomenon is justified by Modigliani and Miller by the process of arbitrage.

**Arbitrage Process**

MM’s proposition works under arbitrage process. The proposition I says that value of levered and unlevered firm are equal. If this is not true and the market price of shares of levered firm is higher than the market price of the shares of unlevered firm as per the NI approach, the arbitrage process will take place to restore the equilibrium in the market. Investors will sell the shares of levered firm to get the higher share price and reduce the higher risk and they will buy the shares of unlevered firm having less risk and lower market price, consequently the market price of the levered firm will reduce and the market price of unlevered firm will increase. For this purpose, the investors will indulge into personal or homemade leverage against the corporate leverage and market value of share price of both levered and unlevered firm will be equal.

**Proposition II: Perception of Shareholders on financial risk**

As per this proposition, the financial leverage affects share holder’s return in term of Earnings per Share (EPS) and return on equity (ROE). When the financial leverage is favorable i.e. when the rate of return on investment is more than the rate of interest on debt, EPS and ROE increase with increase in the financial leverage. At the same time shareholder’s financial risk increases with increase in debt equity ratio in the capital structure. Thus, financial leverage causes two opposite effects, it increases the shareholder’s return but at same time it also increases their financial risk. To compensate the financial risk, shareholders increase their expected rate of return (i.e. the cost of equity). The higher the financial risk, the higher the shareholders’ required rate of return or the cost of equity.

In case of unlevered firm, its opportunity cost of capital (Ka) is equal to its cost of equity (Ke) i.e. Ke = Ka as per proposition II of MM approach, opportunity cost of capital remains constant with financial leverage. This happens because the advantage of cheaper cost of debt is offset by increase in the cost of equity. So the opportunity cost of capital (Ka) does not change. A levered firm has financial risk while an unlevered firm does not have the financial risk. Hence, a levered firm will have higher required return on equity.
as a compensation for financial risk. The cost of equity for a levered firm should be higher than the opportunity cost of capital is i.e. $K_e > K_a$. Cost of equity should be equal to opportunity cost of capital plus a financial risk premium i.e. $K_e = K_a +$ Financial risk premium. The financial risk premium is decided as under.

For a levered firm

Cost of capital = weighted average cost of equity + cost of debt

$$K_a = K_e \times \frac{E}{E+D} + K_d \frac{D}{E+D}$$

or

$$K_e = K_a + (k_a - k_d) \frac{D}{E}$$

In case of unlevered firm, $D$ (debt) is zero, therefore opportunity cost of capital ($k_a$) equals the cost of equity ($k_e$) i.e. $k_a = k_e$.

From the above equation it is clear that financial risk premium of a levered firm is equal to debt-equity ratio ($D/E$), which is the additional cost over cost of opportunity expected by equity share holders.

The core part of preposition II is that the levered firm’s opportunity cost of capital will not rise even if use of financial leverage is increased.

The excessive use of debt increases the business risk, consequently cost of debt increases with excessive use of financial leverage. MM approach emphasizes that when cost of debt increases the cost of equity will increase at a decreasing rate and may even reduce. This is because the debt holders bear some of the firm’s business risk and the operating risk of shareholders is transferred to debt-holders.

Diagram 4.5 explains this phenomenon.
Diagram 4.5

Effect of Financial leverage on Cost of Capital under Arbitrage Process

The diagram 4.5 explains that as the debt increases beyond certain level cost of debt increases. The increased debt would absorb the business risk, which gives relief to equity shareholders in terms of operating risk and the cost of equity declines. As the increased operating risk of equity shareholders is absorbed by the debt holders, the overall cost of capital remains constant.

Criticism of the MM Hypothesis

MM hypothesis is criticized on following grounds:

(i) Imperfections do exist in capital market

The assumption of perfect capital market is practically not correct. Imperfections are bound to exist in capital market due to many varied factors. Because of imperfections in capital market, arbitrage may fail to work and market value of levered and unlevered firm may vary.
The assumptions of rate of interest fail in practice

The hypothesis assumes that firms and individuals can lend and borrow funds at the same rate of interest. Firms have always higher creditworthiness hence they can borrow at a cheaper rate of interest than individuals.

Personal leverage is not a substitute for corporate leverage

The hypothesis assumes that personal or homemade leverage is a perfect substitute for corporate leverage which is not correct. This is because in case of shareholders, the liability is limited to the extent of their investments only. Whereas an individual's liability is unlimited. Thus, it is more risky to create personal leverage and invest in the unlevered firm than investing directly in the levered firm.

The assumption of the absence of transaction cost is also not correct

Transaction cost of buying and selling securities does exist. Due to transaction cost, it is necessary to invest more amounts to earn the same return.

Corporate tax does exist

The assumption of non-existence of corporate tax is also not correct. Practically, interest charges are tax deductible. This makes the cost of borrowing cheaper than the annual rate of interest. Tax advantage results in a large return in case of a levered firm if return on investment is more than the rate of interest.

**4.9 MM HYPOTHESIS UNDER CORPORATE TAXES**

M.M. Hypothesis (1958) is based on the assumption of absence of corporate tax, the value of the firm is independent of level of debt—equity mix in the capital structure. Practically the corporate tax does exist and it affects the tax liability and makes the debt financing advantageous in favor of equity shareholders. In 1963 M.M. in their article discussed the existence of corporate tax and its impact on tax liability and value of the levered firm. They held that because of deductibility of interest charges for tax computation, the value of the levered firm would be higher than that of the unlevered firm.

Diagram 4.6 shows the relationship between leverage and value of levered and unlevered firm under corporate tax.
The MM’s view under corporate tax suggest that because of the tax deductibility of interest charges a firm can increase its value by using more and more financial leverage. Thus, the optimum capital structure is reached when 100% debt is used. However, they suggest that the firm should decide a target debt ratio because lenders impose their terms while lending more funds as debt, which creates many problems like possibility of financial distress, interference of moneylenders on dividend decision etc.

4.10 MILLER’S MODEL UNDER CORPORATE TAX AND PERSONAL TAX

MM theory under corporate considers only corporate tax and ignores the personal tax. Miller’s model (1977) considers both corporate as well as personal tax.

Miller’s model is based on the assumption that the personal tax on equity dividend is zero and therefore investor would prefer to invest in equity rather than in debt. On the other hand, firms get incentive of tax deduction in debt and not on equity, therefore firms would prefer to raise funds through debt rather than equity to reduce the corporate tax. Such firms would prefer to issue debt to those investors who are not in the bracket of personal tax. Therefore, firm would offer higher interest on debt. The investors who are
not in tax bracket will expect minimum rate of interest before tax, which is equal to after tax interest for investors falling in tax bracket. For example, if the personal tax rate is 20% and the rate of interest on debt is 15%, the effective rate of interest after tax will be 12%, i.e. 15% rate of interest – 3% tax (20% of 15%). Thus, the investors who are not in tax bracket would demand at least 15% return on their investment in debt. Now, if the firms want to attract those investors who are in high tax bracket, will have to offer higher rate of interest.

Generally, the personal income tax system is progressing, the firms will have to keep the rate of interest rising to attract all investors. The firms will be motivated to keep the interest rate rising if the corporate tax saving is greater than the personal tax loss. Firms will stop borrowing when the corporate tax rate and personal tax rate become equal and the advantage from financial leverage becomes zero. This can be explained by following diagram 4.7

Diagram 4.7

Effect of Financial leverage under Corporate Tax

$K_d^d$ represents the demand rate of debt and $K_d^s$ represents the supply rate or the expected rate of interest in figure 4.8.
The firm becomes equilibrium at the point where, the rate of interest on debt offered by the firm equals the expected rate of interest after tax by investors.

4.11 THE TRADE-OFF THEORY: COST OF FINANCIAL DISTRESS AND AGENCY COST

This theory discusses the limitations of 100% debt oriented capital structure where WACC is minimum and market value of the firm is maximum. This theory raises a question on practical possibility of a firm going for 100% debt to avail tax advantage and attaining the optimum capital structure. As per this theory 100%, debt is not possible because of three factors.

(I) Personal tax on interest income
(II) Cost of financial distress
(III) Agency Cost

The effect of above factors is now discussed to show how a firm can achieve optimum capital structure by using financial leverage

(I) Personal tax on interest income:
A firm may tend to finance assets by 100% debt to achieve maximum benefit of tax and minimize WACC. However, 100% of debt increases interest income to debenture holders, which consequently increases their tax liability. Hence, investors prefer to invest in debt only up to certain level and beyond certain level, the debt becomes less attractive.

(II) Cost of Financial Distress:
Practically higher debt increase legal obligations of the firm towards funds providers in terms payment of interest and principal amount as an when it becomes due. When a firm is not able to meet these obligations, financial distress arises. The firm’s continuous failure to make payments to debt holders can ultimately lead to the insolvency of the firm. With high debt and high financial and business risk, the probability of financial distress becomes more acute. The degree of business risk of a firm depends on the degree of operating leverage (fixed cost of business), general economic conditions, demand and price of the product, prevailing competition, diversification and modernization etc. The operating risk becomes acute if the companies are highly capital intensive and having high burden of fixed costs. Fixed cost arising due to financial leverage creates financial distress. The financial distress involves two costs viz. direct cost and indirect cost.
(a) **Direct cost:** Direct cost of financial distress includes cost of insolvency. Insolvency creates many problems like cumbersome process, conflicting interests of creditors and other stakeholders, delay in liquidation of company's assets, deterioration of assets due to non-maintenance, decline in realizable value of assets etc. Insolvency also involves high legal and administrative costs.

(b) **Indirect costs:**
Financial distress also involves many indirect costs. These costs relate to the actions of employees, managers, customers, suppliers and shareholders.

(i) **Employees:** Employees of a financially distressed firm get frustrated and their productivity and quality of products are affected adversely. Efficient managers and other employees leave the company. Reputation of the firm is affected and sales may drop.

(ii) **Customers:** Customers worry about quality of product or services and after sales services and most of the customers may switch over to other suppliers.

(iii) **Suppliers:** Suppliers discontinue granting credit to financially distressed firms. Creditors resort to strict collection process to realize their dues. Under this situation, firms are forced to go into liquidation.

(iv) **Investors:** Investors hesitate to either provide funds or expect more return on their funds on rigid terms to financially distressed firms. This creates a problem of raising funds and the operating performance of the firm is adversely affected.

(v) **Shareholders:** The project of a financially distressed firm becomes more risky. Shareholders behave differently with such firms. They may finance the project in anticipation of high return on success of the project. As shareholders liability is limited, they do not suffer heavy loss, if the project fails but at the same time, they also have an option of exiting from such firms.

(vi) **Managers:** Decision making tendency of managers is changed for a financially distressed firm. Managers start taking decisions keeping in mind short-term rather than long-term interests of the company. To improve short-term liquidity they may sell productive assets. They prefer to avoid short-term risk to future investment opportunity. They also resort to cost-cut measures ignoring quality of products. These sub-optimal decisions may push the firm into liquidation.

**Optimum capital structure of financially distressed firm:**
Optimum capital structure of financially distressed firm is decided keeping in view the use of leverage and market value of the firm as follows.

Value of levered firm = Value of unlevered firm + Present Value of tax shield - Present Value of financial distress.

\[ V_l = V_u + PV_{INTS} - PV_{FD} \]

This can be explained with the help of diagram, 4.8 as under

**Diagram 4.8**

*Effect of Financial leverage under Financial Distress*

The diagram 4.8 shows how the capital structure of financially distressed firm is determined considering the tax benefit and the cost of financial distress. As the debt is increased in the capital structure of financially distressed firm, the present value of the interest tax shield increases but at the same time the present value of cost of financial distress also increases. Cost of financial distress is insignificant at the moderate level of
debt and therefore the value of the firm increases with debt. As more and more debt is used, the cost of financial distress increases and the tax benefit reduces. The optimum point is reached when the marginal present values of the tax benefit and the financial distress costs are equal.

At this point, the value of the firm is maximum.

(III) Agency costs:

Agency costs arise due to conflicts between shareholders and debt-holders and shareholders and managers. The expectations of different stakeholders are very high but no company can satisfy expectations of all the stakeholders at a time. Interest of shareholders, debt-holders and managers are always conflicting in a company. These conflicts generate agency costs. Agency costs do affect the capital structure of a firm.

(a) **Shareholders – Debt holders’ conflict:** Debt holders get fixed return on their investments but do not get any additional return even if the project is more risky and therefore in such a situation the wealth of debt-holders is transformed in favor of shareholders. It is also possible that debt-holders lend money to invest in low risky project while the firm may invest it in highly risky projects. Under these situation debt-holders feel that they are not rewarded against the business risk taken by the company at the cost of their money on the other hand shareholders have more options open with them. Shareholders have full claim over residual income and they have unlimited claim on the firms assets. In financial crisis shareholders exit from their investment. The business risk, reward and claim are the conflicting points between the interest of shareholders and debenture holders.

(b) **Shareholders – managers’ conflict:** Shareholders are the owners of the company and managers have to act on behalf of shareholders as their agents in the interest of shareholders. The conflict arises if managers transfer shareholders wealth in their favor by increasing their compensation and perquisites. Managers may not take risk and forego profitable investment to protect their jobs.

**Managing the conflict of agency cost:**

As per Pandey (2005), the conflict arising out of agency cost can be minimized by the parties involved in it through monitoring and restrictive covenant. External investors believe that managers may not function in their interest and therefore they tend to
discount the price of the security. These investors require monitoring and restrictive covenants to protect their interest. Shareholders must ensure themselves by using different mechanism that managers’ actions are directed towards the maximization of their wealth or not. Debt-holders can impose restrictions on company indulging in higher debt. They can also get expert opinion from outsiders regarding the financial soundness of the company. The costs of monitoring and restrictive covenants are called agency cost. The implications of agency costs for the capital structure are that the management should use the debt to such an extent, which maximizes the wealth of shareholders.

4.12 THEORIES OF CAPITAL STRUCTURE UNDER ASYMMETRIC INFORMATION

Asymmetric information refers to the situation of absence of balanced information about profitability and future cash flow. As per the hypotheses of these theories investors under value the firm when they do not have balanced financial information about the company. Under this situation the shares of companies having good track record are under valued and shares of companies which do not have consistent track record are over valued by the investors. This behavior of investors affects the financing decision of companies and capital structure of companies. The theories of capital structure under asymmetric information are discussed in following sections.

4.12.1 Pecking Order theory


According to pecking order theory, in the presence of asymmetric information, the equity of high-profit firms will be underpriced and if this under pricing is sufficiently severe, these firms may forgo investments in project that have a net present value. Therefore, firms do not see any problem in preferring debt to raise funds and then other sources followed by retained earnings and equity.

This theory suggests the preference among equity, debt and retained earnings as the source of finance when the additional funds are needed. Other theories do not give any
idea about well-defined debt-equity target that a firm has to prefer debt or equity for additional finance. This theory emphasizes on the target Capital Structure.

There are two types of equity, internal and external. The internal equity is the retained earnings whereas the external equity is the share capital. One equity is on the top of the pecking order and other equity at the bottom; hence, this theory is called as pecking order theory. As per this approach, managers always prefer internal equity to debt and debt to external equity. Therefore, out of three options of financing through internal equity, debt and external equity, the internal equity is the first choice and external equity is the last one.

This theory believes that managers have more information about their firms than investors. This disparity of information is known as asymmetric information. Because of asymmetric information, managers prefer to issue debt when they are sure about future prospects of steady cash flow and ability to pay interest and principal amount of debt. If they prefer equity issue, it implies that current share price is overvalued. But managers prefer internal equity to debt because internal equity is cheaper than debt because of three reasons.

(i) Personal tax may be payable by share holders on their earnings and
(ii) No issue cost is incurred when the earnings are retained and also when it is used.
(iii) No adverse information is revealed to outsiders and investors.

The profitable firms have internal funds to finance their projects and hence, they have lower debt ratio. They prefer equity issue, when they think that shares are overvalued. Thus, the pecking order theory believes that managers raise finance in following order:

(i) They prefer to use internal finance first
(ii) When they do not have internal finance, they prefer to issue debt
(iii) Last option preferred is equity issue.

Thus, pecking order theory explains the inverse relationship between profitability and debt ratio within an industry, but does not explain the capital structure differences among industries.
4.12.2 Latest development

The new dimension added to the theories of capital structure is asymmetric information. This theory gives importance to lemons problem. Lemons problem suggests that if a customer does not have symmetric information, he will value the product at average price. Hence, the better product having absence of balanced information is under valued and average or below average product is overvalued. The same philosophy is applied to firms while raising funds. In absence of proper information, investors will pay only average price of the shares for both types of firm, which deserve better valuation of their shares and those firms, which do not deserve. Hence, firms having good track record of profitability, dividend and better future prospects will be at a loss in terms of valuations of their share prices whereas, shares of the firms which do not have good track record are over valued by the investor and they can get better price of shares. These theories criticize the preference of sources of funds for raising funds of pecking order theory on the ground of asymmetric information about the firm with investors. According to pecking order theory, in the presence of asymmetric information, the equity of high-profit firms will be underpriced and if this under-pricing is sufficiently severe, these firms may forgo investments in projects that have a net present value. This idea is very close to the lemons problem but the assumption here is that there is asymmetry of information with respect to only part of the future cash flow of the firm so under certain conditions the pecking order theory will not be applicable.

As per Rock (JEF 1986), Ritter (JF 1991) and Nikolay and Florian (2003) pecking order seems to work well when it should not, i.e. for large mature firms, and seems not to work well when it should, i.e. for small young non payers of dividends.

They argued that the original pecking order is based on the mispricing of equity caused by not knowing the value of investments. However, when outside investors also do not know the risk of investments, then debt is mispriced too. These theories argue that asymmetric information about both, value and risk, transforms the adverse selection logic into a theory of debt and equity. The main hypothesis of these theories is that firms issue more equity and less debt in situations where risk is an important element of the adverse selection problem of outside financing. This explains why small young non payers of dividends issue equity and large mature firms issue debt.
All the theories of capital structure, while discussing the optimum capital structure take into consideration business risk and financial risk as major determinants, which affect the perception of investors and ultimately the cost of capital. Few theories consider the corporate tax, agency cost, perception of managers and asymmetric information as determinants of capital structure. The possibility of attaining the optimum capital structure also has a mixed opinion. All experts have considered the difference in cost of equity and cost of debt and its effect on optimum capital structure. No theory discusses the influence of other factors on capital structure like change in cost of capital due to change in the route of issuing capital. For instance, if equity capital is raised by different routes like public offering, shares issued under employees stock option Plan, right shares, private placement, preferential allotment, venture capital, euro issue, qualified institutional placement etc., the cost of equity under each such route differs and hence the market value of the firms under the same business risk will differ even though all firms are unlevered. Even the purpose of raising debt nowadays has changed. The companies resort to an extensive and costly debt for take over and merger resulting into better business potentiality. Therefore, the cost of debt should be viewed from the perspective of exploring the business opportunities rather than only the rate interest.

In a capital market like India, where capital market was highly regulated the cost of capital was fixed for long time. Hence, regulations were used to fix the cost of capital of Indian companies. When the market was deregulated, the cost of capital became highly flexible due to many reasons. Competition, freedom of raising funds through various resources priced differently, borrowing can be made from public through different instruments at different cost, and the premium with each financial instrument affects the cost of capital. Therefore, the companies on one hand seek much more freedom to take decision about capital structure but they also have to pay greater attention to the expectations of stakeholders. Therefore, none of the theories of capital structure may be relevant in an emerging deregulated capital market like India. Hence, for the Indian capital market, the change in market regulations is taken as the crucial independent determinant of capital structure.