

## [Academic Script]

**Theories of Capital Structure- Part-II** 

#### Subject:

**Business Economics** 

**Course:** 

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Lecture No. & Title:

Lecture – 3 Theories of Capital Structure- Part-II

#### **Academic Script**

## 1. Introduction

We discussed Net Income Approach and Net Operating Income Approach of Capital Structure in the earlier session. In this session we are going to discuss the Traditional Approach and Modigliani Miller Approach of capital Structure.

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 overall 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 shareholders 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.

# 2. 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:

Effect of Financial Leverage on Cost of Equity, Cost of Debt and Overall Cost of Capital under Traditional Approach can be explained with the help of diagram



0 Financial Leverage (Use of Debt)

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.

## 3. 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 certain grounds like;

- (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. Modigliani Miller (MM) Approach

## The last theory we are going to discuss is 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:

## 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 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) = NOIKI i.e. Net Operating Income/ Cost of capital of a levered firm.

Overall cost of capital (Ko) or Kl *NOIVI* i.e. Net Operating Income/ value of a levered firm

Where,

NOI refers to Net Operating Income

Ka refers to Opportunity cost

VI refers to Value of levered firm

KI refers to Levered firm's cost of capital

Ko refers to 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 = NOIVu i.e. Unlevered firm's cost of capital/ Value of unlevered firm

Where,

Ku refers to unlevered firm's cost of capital Vu refers to 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 (kl) = unlevered firm's cost of capital (Ku)

This is explained with the help of the diagram:



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 (Ko) 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 (Ka).

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). 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. Ke > Ka. Cost of equity should be equal to opportunity cost of capital plus a financial risk premium. i.e. Ke = Ka+ Financial risk premium. The financial risk premium is decided as.

For a levered firm

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

 $Ka = Ke \times EE + D + Kd DE + D$ 

or

Ke = Ka + (ka - kd)DE

Here Ka refers to opportunity cost of capital and Kd refers to cost of debt while E refers to Equity and D refers to debt In case of unlevered firm, D (debt) is zero, therefore opportunity cost of capital (ka) equals the cost of equity (ke) i.,e. ka = ke. From this 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.

Effect of Financial leverage on Cost of Capital under Arbitrage Process can be explained with the help of diagram



The diagram 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.

#### **5.** Criticism of the MM Hypothesis

MM hypothesis is criticized on certain 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.

(ii) The assumptions of rate of interest fails in practice

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

(iii) 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. Where as an individuals 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.

(iv) 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.

#### (v)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 large return in case of a levered firm if return on investment is more than the rate of interest.

#### 6. Summary

Let us end the discussion with note that in this session we studied traditional approach and Modigliani Miller Approach of capital structure their views on relationship between financial leverage, cost of capital and value of the firm.