Quadrant II - Notes

Paper Code: DSE-05

Module Name: Models Related to Investment and Dividend Decision: M.M Hypothesis (Modigliani And Miller)

Modigliani- Miller Theory on Dividend Policy
Modigliani – Miller theory is a major proponent of 'Dividend Irrelevance' notion. According to this concept, investors do not pay any importance to the dividend history of a company and thus, dividends are irrelevant in calculating the valuation of a company. This theory is in direct contrast to the 'Dividend Relevance' theory which deems dividends to be important in the valuation of a company.

Crux of Modigliani-Miller Model

Modigliani – Miller theory was proposed by Franco Modigliani and Merton Miller in 1961. They were the pioneers in suggesting that dividends and capital gains are equivalent when an investor considers returns on investment. The only thing that impacts the valuation of a company is its earnings, which is a direct result of the company's investment policy and the future prospects. So, according to this theory, once the investment policy is known to the investor, he will not need any additional input on the dividend history of the company. The investment decision is, thus, dependent on the investment policy of the company and not on the dividend policy.

Modigliani – Miller theory goes a step further and illustrates the practical situations where dividends are not relevant to investors. Irrespective of whether a company pays a dividend or not, the investors are capable enough to make their own cash flows from the stocks depending on their need for the cash. If

the investor needs more money than the dividend he received, he can always sell a part of his investments to make up for the difference. Likewise, if an investor has no present cash requirement, he can always reinvest the received dividend in the stock. Thus, the Modigliani – Miller theory firmly states that the dividend policy of a company has no influence on the investment decisions of the investors.

This theory also believes that dividends are irrelevant by the arbitrage argument. By this logic, the dividends distribution to shareholders is offset by the external financing. Due to the distribution of dividends, the price of the stock decreases and will nullify the gain made by the investors because of the dividends.

Assumptions of the Model

Modigliani – Miller theory is based on the following assumptions:

Perfect Capital Markets

This theory believes in the existence of 'perfect capital markets'. It assumes that all the investors are rational, they have access to free information, there are no flotation or transaction costs and no large investor to influence the market price of the share.

No Taxes

There is no existence of taxes. Alternatively, both dividends and capital gains are taxed at the same rate.

Fixed Investment Policy

The company does not change its existing investment policy. It means whatever may be the dividend payment, the company will make investment as it has already decided upon. If the company is going to pay more amount of dividend, then it will more equity shares and vice versa.

No Risk of Uncertainty

All the investors are certain about the future market prices and the dividends. This means that the same discount rate is applicable for all types of stocks in all time periods.

Investor is indifferent between dividend income and capital gain income

It is assumed that investor is indifferent between dividend income and capital gain income. It means if he requires total return of Rs. 500, he may get Rs. 200 dividend income and Rs. 300 as capital gain income or reverse, in either of the case he gets equal satisfaction.

Valuation Formula and its Denotations

Modigliani – Miller's valuation model is based on the assumption of same discount rate/rate of return applicable to all the stocks.

$P_1 = P_0 * (1 + ke) – D1$

Where,

P_1 = market price of the share at the end of a period

P_0 = market price of the share at the beginning of a period

ke = cost of capital

D1 = dividends received at the end of a period

Explanation of Modigliani – Miller's model

Modigliani – Miller's model can be used to calculate the market price of the share at the end of a period, if the share price at the

beginning of the period, dividends and the cost of capital are known.

Share price at the beginning of the year is Rs. 150. The discount rate applicable to the company is 10%. The company declares Rs. 10 as dividends at the end of a year. Market price of the share at the end of one year using the Modigliani – Miller's model can be found as under.

Here, $P_0 = 150$

ke = 10%

D1 = 10

Market price of the stock = $P_1 = 150 * (1 + .10) – 10 = 150 *1.1 – 10 = 155$.

As per M M Approach value of entire firm / company can be found as under:-

$nP0 = (n + \Delta n) \times P_{1 – I + E / (1 + ke)}$

Explanation of formula:-

1. Retained Earning = $E – n D_1$

E = Earning

n = Number of Outstanding Equity shares at the beginning of the year

D_1= Dividend Paid to existing shareholders at the end of year

2. New Issue of Equity Share Capital (Rs.) = I – Retained earning

$= I – \{E – n D_1\}$

$= I – E + nD_1$

I = Investment to be made at the end of the year

3. New Issue of Equity shares at the end of the year (Δn)

New Issue of Equity Shares at the end of year = $\Delta n \times P_1$

So, we can say that

$\Delta n \times P_1$ = New Issue of Equity Share Capital (Rs.)

$\Delta n \times P_1 = I - E + nD1$

Now, explanation of formula starts,

As we know that for one equity share :-

$P_1 = P_0 * (1 + ke) - D1$

$P_0 = D_1 + P1 / (1 + ke)$

Now, in above equation, n is multiplied on both sides, so instead of one share, it will become value of firm:-

$nP_0 = nD_1 + nP1 / (1 + ke)$

In order to derive a formula, $\Delta n \times P_1$ is added and subtracted to right hand side equation:-

$nP_0 = nD_1 + nP1 + \Delta n \times P_1 - \Delta n \times P1 / (1 + ke)$

Now, P1 is taken common from nP1 and $\Delta n \ P_1$

$nP_0 = nD_1 + (n + \Delta n) \times P_1 - \Delta n \times P1 / (1 + ke)$

$\Delta n \times P_1$ is replaced with **$I - E + nD_1$**

$nP_0 = nD_1 + (n + \Delta n) \times P_1 - \{I - E + nD1\} / (1 + ke)$

Now, we open bracket of **$I - E + nD_1$**

$nP_0 = nD_1 + (n + \Delta n) \times P_1 - I + E - nD1 / (1 + ke)$

nD1 is cancelled from both sides;

So, now we are left with following formula :-

$nP_0 = + (n + \Delta n) \times P_{1 - I + E} / (1 + ke)$

Criticism of Modigliani Miller's Model

Modigliani – Miller theory on dividend policy suffers from the following limitations:

- Perfect capital markets do not exist. Taxes are present in the capital markets.
- According to this theory, there is no difference between internal and external financing. However, if the flotation costs of new issues are considered, it is false.
- This theory believes that the shareholder's wealth is not affected by the dividends. However, there are transaction costs associated with the selling of shares to make cash inflows. This makes the investors prefer dividends.
- The assumption of no uncertainty is unrealistic. The dividends are relevant under the certain conditions as well.

Summary

Modigliani – Miller theory of dividend policy is an interesting and a different approach to the valuation of shares. It is a popular model which believes in the irrelevance of the dividends. However, the policy suffers from various important limitations and thus, is critiqued regarding its assumptions.[1]

Example: ABC Ltd. is in a risk class for which the appropriate capitalization rate is 9%. At present, the firm has 50,000 outstanding shares selling at Rs 100 each. The firm is planning to declare a dividend of Rs 5 per share at the end of the current financial year. The company is expecting a net income of Rs.4,00,000 this year. It is also planning to take up a new project for which an investment of Rs.7,15,000 is required. Prove that as per the MM approach the payment of dividends will not affect the value of the firm.

Solution:

a. **Value of the firm when dividends are not paid**:

i.Price at the end of year 1:

The price at the end of the year can be computed using the following formula:

$$P_0 = \frac{1}{(1+k_e)}(D_1 + P_1)$$

i.e. 100 = $\frac{1}{1.09}(5 + P_1)$

P_1 = Rs. 104.

ii.Amount required to be raised from the issue of new shares

$$n_1 P_1 = I - (E - nD_1)$$

= 7,15,000 – (4,00,000 – 50,000 x 5) = Rs. 5,65,000.

iii.Number of additional shares to be issued

$n_1 = \frac{5,65,000}{104}$ = 5,433 shares approximately.

Hence, value of the firm after the dividends are declared is given by:

$$nP_0 = \frac{(n+\Delta n)P_1 - I + E}{(1+k_e)} = \frac{(50,000+5,433)104 - 7,15,000 + 4,00,000}{(1+0.09)}$$

= Rs. 50,00,029.

b. **The value of the firm when the dividends are not paid**:

i. Price of the share at the end of year 1:

$$P_0 = \frac{1}{(1+k_e)}(D_1 + P_1)$$

i.e. 100 = $\frac{P_1}{(1.09)}$

i.e. P_1= Rs 109.

ii. Amount required to be raised from the issue of new shares
n_1p_1 = (7,15,000 – 4,00,000) = Rs. 3,15,000.

iii. Number of new shares to be issued

$n_1 = \frac{315000}{109}$ = 2890 shares (approximately).

Hence, the value of the firm can be computed as:

$$nP_0 = \frac{(n+n_1)P_1 - I + E}{(1+k_e)} = \frac{(50,000+2890)109 - 7,15,000 + 4,00,000}{1.09}$$ = Rs 50,00,009.

From the above example, we observe that the value of the firm remains the same (approximately) irrespective of the payment of dividends. This indicates that the shareholders are indifferent between retention and payment of dividends.

Limitations of MM approach

The assumptions made under this approach are quite unrealistic. We may not find capital markets to be perfect in reality. Certain assumptions under the MM hypothesis that are not relevant are:

1. **Tax differential:** MM hypothesis assumes that there is no difference between the tax rate applicable to dividends and capital gains. But in reality, different tax rates are applicable to dividends and capital gains. Usually, the capital gains tax rate is lower than the dividends income tax rate. From the tax point of view, a shareholder should prefer capital gains to current dividends because (a) the capital gains tax rate is less than the dividends tax rate and (b) the capital gains tax is applicable only when the shares are actually sold. The effect of favourable tax rate in case of capital gains will lead to tax savings.

2. **Floatation costs:** MM hypothesis assumes that there are no financial costs. But in practice, floatation costs do exist in case of new issues. Hence if the company retains the earnings, then no floatation costs will be involved but the firm will have to pay underwriting fee and brokerage charges if it issues new shares. Thus, in the presence of floatation costs, retention of earnings would be preferred to payment of dividends.

3. **Transaction costs:** MM hypothesis assumes the absence of transaction costs. But when a shareholder sells shares, he needs to pay some brokerage fee which is more in the case of small sales. Hence because of the existence of transaction costs, the shareholders may prefer dividends to capital gains.

4. **Information asymmetry:** MM hypothesis assumes the existence of perfect capital markets in which the information is freely available to all. But in practice, managers may not share complete information with the shareholders. This might lead to conflicts between managers and shareholders. The dividend policy helps in reducing the conflict arising between shareholders and managers due to information asymmetry.

5. **Market conditions:** Conditions existing in the market tend to influence the dividend policy. For example: A firm might be

having profitable avenues for investment but it might not be having access to funds due to bad market conditions. This will force the firm to retain more earnings and follow a less dividend pay-out ratio.
The conditions mentioned above explain the shortcomings of MM approach towards dividend policy.

Summary

There are two different schools of thought on the dividend policies of a firm. According to one school of thought in a perfect market situation investment and financing decisions are independent and thus, the dividend decisions become irrelevant. The model given by Miller & Modigliani belongs to this school of thought. They also consider that the share value of the firm is based on the investment opportunities of the firm. However, the imperfect market conditions and the uncertainty prevailing in the future earnings do not provide enough support to this model. The second school of thought explains the relevance of the dividend policy and the impact of the same on the share value. However, in spite of these dividend models, it should be noted that investors are risk-averse and prefer current dividend to future earnings. Further, with maximization of shareholder wealth being the most important issue, the dividend policies of a firm will vary, depending on the operational environment.