# DIVIDEND DECISIONS
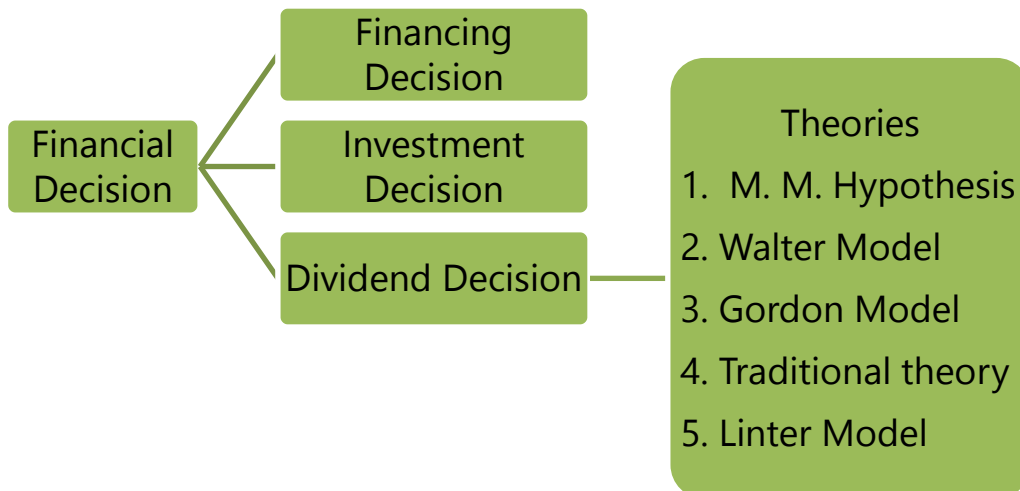
## LEARNING OUTCOMES

❑ Understand the Meaning of Dividend Decision

❑ Understand the importance of Dividend Decision

❑ Discuss various Forms of Dividend

❑ Discuss various Determinants of Dividend

❑ Explain various theories of Dividend Decisions.

## CHAPTER OVERVIEW

Financial Decision
- Financing Decision
- Investment Decision
- Dividend Decision

Theories
1. M. M. Hypothesis
2. Walter Model
3. Gordon Model
4. Traditional theory
5. Linter Model

# 9.1 INTRODUCTION

Financial management is the process of making financial decisions. Financial decision broadly covers three areas:

i.      Financing decision

ii.     Investment decision

iii.    Dividend decision

Dividend decision is one of the **most important areas of management decisions.** It is easy to understand but difficult to implement. Let's understand this with the help of an example, suppose a company, say X limited, which is continuously paying the dividend at a normal growth rate, earns huge profits this year. Now the management has to decide whether continue to pay dividend at normal rate or to pay at an increasing rate? Why this dilemma?

The reason is that, if the management decides to pay higher dividend, then it might be possible that next year, the company will not achieve such higher growth rate, resulting the next year's dividend will be low as compared to last year's. However, if the company decides to stay on the normal rate of dividend then surplus amount of retained earnings would remain idle which will result in over capitalization, if no opportunity existing to utilize the funds.

Also there are more factors which will affect the dividend decision (will be discussed later).

There are few theories which put light on the complexities involved in dividend decision. These theories will be discussed under two categories
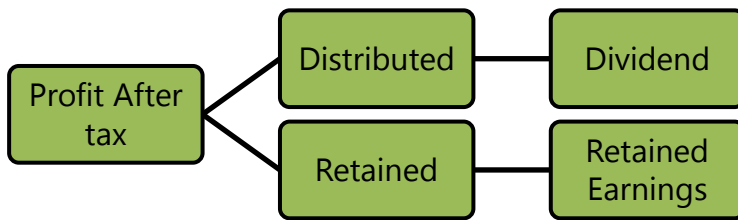
**Irrelevance theory**: MM approach

**Relevance theories**: Walter model & Gordon Model

# 9.2 MEANING OF DIVIDEND

Dividend is that part of profit after tax which is **distributed to the shareholders** of the company. In other words, the profit earned by a company after paying taxes can be used for:

i.      Distribution of dividend or

ii.     Can be retained as surplus for future growth

# 9.3 SIGNIFICANCE OF DIVIDEND POLICY

Dividend policy of a firm is governed by:

**(i)    Long Term Financing Decision:**

As we know that one of the financing option is 'Equity'. Equity can be raised externally through issue of equity shares or can be generated internally through retained earnings. But retained earnings are preferable because they do not involve floatation costs.

But whether to retain or distribute the profits forms the basis of this decision. Since payment of cash dividend reduces the amount of funds necessary to finance profitable investment opportunities thereby restricting it to find other avenues of finance.

Under this purview, the decision is based on the following:

1.    Whether the organization has opportunities in hand to invest the amount of profits, if retained?

2.    Whether the return on such investment (ROI) will be higher than the expectations of shareholders i.e. $K_e$.

**(ii)    Wealth Maximization Decision:**

Under this head, we are facing the problem of amount of dividend to be distributed i.e. the Dividend Payout ratio (D/P) in relation to Market price of the shares (MPS).

1.    Because of market imperfections and uncertainty, shareholders give higher value to near dividends than future dividends and capital gains. Payment of dividends influences the market price of the share. Higher dividends increase value of shares and low dividends decrease it. A proper balance has to be struck between the two approaches.

2. When the firm increases retained earnings, shareholders' dividends decrease and consequently market price is affected. Use of retained earnings to finance profitable investments increases future earnings per share.

On the other hand, increase in dividends may cause the firm to forego investment opportunities for lack of funds and thereby decrease the future earnings per share.

Thus, management should develop a dividend policy **which divides net earnings into dividends and retained earnings** in an optimum way so as to achieve the objective of wealth maximization for shareholders. Such policy will be influenced by investment opportunities available to the firm and value of dividends as against capital gains to shareholders.

# 9.4 FORMS OF DIVIDEND

Generally, the dividend can take any of the following forms (depending upon some factors will be discussed later):

**1.** **Cash dividend**: It is the most **common form of dividend**. Cash here means cash, cheque, warrant, demand draft, pay order or directly through Electronic Clearing Service (ECS) but not in kind.

**2.** **Stock dividend (Bonus Shares)**: It is a **distribution of shares in lieu of cash dividend** to existing shareholders. When the company issues further shares to its existing shareholders without consideration it is called bonus shares. Such shares are distributed proportionately thereby retaining proportionate ownership of the company. If a shareholder owns 100 shares at a time, when 10% dividend is declared he will have 10 additional shares thereby increasing the equity share capital and reducing reserves and surplus (retained earnings). The total net worth is not affected by bonus issue.

## Advantages of Stock Dividend

There are many advantages both to the shareholders and to the company. Some of the important ones are listed as under:

(1) *To Share Holders*:

    (a) Tax benefit –At present there is no tax on dividend received from a domestic company.

    (b) Policy of paying fixed dividend per share and its continuation even after declaration of stock dividend will increase total cash dividend of the shareholders in future.

(2)    *To Company*:

   (a)    Conservation of cash for meeting profitable investment opportunities.

   (b)    Cash deficiency and restrictions imposed by lenders to pay cash dividend.

## Limitations of Stock Dividend

Limitations of stock dividend to shareholders and to company are as follows:

1.    **To Shareholders**: Stock dividend does not affect the wealth of shareholders and therefore it has no value for them. This is because the declaration of stock dividend is a method of capitalising the past earnings of the shareholders and is a formal way of recognising earnings which the shareholders already own. It merely divides the company's ownership into a large number of share certificates. James Porterfield regards stock dividends as a division of corporate pie into a larger number of pieces. Stock dividend does not give any extra or special benefit to the shareholder. His proportionate ownership in the company does not change at all. Stock dividend creates a favourable psychological impact on the shareholders and is greeted by them on the ground that it gives an indication of the company's growth.

2.    **To Company**: Stock dividends are more costly to administer than cash dividend. It is disadvantageous if periodic small stock dividends are declared by the company as earnings. This result in the measured growth in earnings per share being less than the growth based on per share for small issues of stock dividends are not adjusted at all and only significant stock dividends are adjusted. Also, companies have to pay tax on distribution.

# 9.5 RELATIONSHIP BETWEEN RETAINED EARNINGS AND GROWTH

It can be illustrated with the help of the following equation:

$$\text{Growth (g) = br}$$

Where,

g = growth rate of the firm

b = retention ratio

r = rate of return on investment

Let's explain this situation with the help of an example:

Suppose, there are two companies, A Ltd & B Ltd, having a capital employed of ₹ 50,00,000 in terms of Equity shares of ₹100 each are earning @ 20%. Both have same capital structure and same ROI but different dividend policy.

A Ltd. distributes 100% of its earnings whereas B Ltd only 50%.

Now, considering the other things remain same, the position of both the companies during the next year will be:

| A Ltd | (₹) | B Ltd | (₹) |
|---|---|---|---|
| **Previous year** | | **Previous year** | |
| Earnings | ₹ 10,00,000 | Earnings | ₹ 10,00,000 |
| Dividend | ₹ 10,00,000 | Dividend | ₹ 5,00,000 |
| Retained Earnings | Nil | Retained Earnings | ₹ 5,00,000 |

| Current year | | Current year | |
|---|---|---|---|
| Existing capital | ₹ 50,00,000 | Existing capital | ₹ 50,00,000 |
| Retained Earnings | Nil | Retained Earnings | ₹ 5,00,000 |
| Total capital employed | ₹ 50,00,000 | Total capital employed | ₹ 55,00,000 |
| Earnings@ 20% | ₹ 10,00,000 | Earnings@ 20% | ₹ 11,00,000 |

Hence with the help of above example, it is easy to understand that how retained earnings will lead to growth.

# 9.6 DETERMINANTS OF DIVIDEND DECISIONS

The dividend policy is affected by the following factors:

1.  **Availability of funds**: If the business is in requirement of funds, then retained earnings could be a good source. Since it saves the floatation cost and further the control will not be diluted as in case of further issue of share capital.

2.  **Cost of capital**: If the financing requirements can be financed through debt (relatively cheaper source of finance), then it should be preferred to distribute more dividend but if the financing is to be done through fresh issue of equity shares, it is better to use retained earnings as much as possible.

3.  **Capital structure**: An optimum Debt equity ratio should also be under consideration for the dividend decision.

4.  **Stock price**: Stock price here means market price of the shares. Generally, higher dividends increase value of shares and low dividends decrease it.

5.  **Investment opportunities in hand**: The dividend decision is also affected, if there are investment opportunities in hand, the company may prefer to retain more from the earnings

6.  **Internal rate of return**: If the internal rate of return is more than the cost of retained earnings, it's better to distribute the earnings as much as possible.

7.  **Trend of industry**: Few industries have been seen by investors for regular income, hence in such cases, the firm will have to pay dividend for survival.

8.  **Expectation of shareholders**: The shareholders can be categorised in two categories: (i) those who invests for regular income, & (ii) those who invests for growth. Generally, the investor prefers current dividend over the future growth.

9.  **Legal constraints**: Section 123 of the Companies Act, 2013 came into force from 1st April, 2014 which provides for declaration of dividend. According to this section:

    (i)  *Dividend shall be declared or paid by a company for any financial year only:*

         (a)  out of the profits of the company for that year arrived at after providing for depreciation in accordance with the provisions of section 123(2), or

         (b)  out of the profits of the company for any previous financial year or years arrived at after providing for depreciation in accordance with the provisions of that sub-section and remaining undistributed, or

         (c)  out of both; or

         (d)  out of money provided by the Central Government or a State Government for the payment of dividend by the company in pursuance of a guarantee given by that Government.

10. **Taxation**: As per Section 115-O of Income Tax Act, 1961, dividend is subject to dividend distribution tax (DDT) in the hands of the company. Under the existing provisions of Section 10(34) of the Act dividend which suffer DDT under section 115-O is exempt in the hands of the shareholder.

Further, any income by way of dividend in excess of ₹ 10 lakhs shall be chargeable to tax in the case of an individual, HUF or a firm who is resident in India, at the rate of ten percent.

# 9.7 PRACTICAL CONSIDERATIONS IN DIVIDEND POLICY

A discussion on internal financing ultimately turns to practical considerations which determine the dividend policy of a company. The formulation of dividend policy depends upon answers to the questions:

* whether there should be a stable pattern of dividends over the years or

* whether the company should treat each dividend decision completely independent. The practical considerations in dividend policy of a company are briefly discussed below:

**(a)   Financial Needs of The Company:** Retained earnings can be a source of finance for creating profitable investment opportunities. As we discussed earlier, when internal rate of return of a company is greater than return required by shareholders, it would be advantageous for the shareholders to re-invest their earnings.

Risk and financial obligations increase if a company raises capital through issue of new shares  where floatation costs are involved.

| Mature Companies | Growth Companies |
|---|---|
| 1. Mature companies having few investment opportunities will show high payout ratios; | 1. Growth companies, on the other hand, have low payout ratios. They are in need of funds to finance fast growing fixed assets. |
| 2. Share prices of such companies are sensitive to dividend charges. | 2. Distribution of earnings reduces the funds of the company. They retain all the earnings and declare bonus shares to offset the dividend requirements of the shareholders. |
| 3. So a small portion of the earnings are kept to meet emergent and occasional financial needs. | 3. These companies increase the amount of dividends gradually as the profitable investment opportunities start falling. |

**(b) Constraints on Paying Dividends**

(i) *Legal*: Under Section 123 of the Companies Act 2013, Dividend shall be declared or paid by a company for any financial year only:

(a) Out of the profits of the company for that year arrived at after providing for depreciation in accordance with the provisions of section 123(2), or

(b) Out of the profits of the company for any previous financial year or years arrived at after providing for depreciation in accordance with the provisions of that sub-section and remaining undistributed, or

(c) Out of both; or

(d) Out of money provided by the Central Government or a State Government for the payment of dividend by the company in pursuance of a guarantee given by that Government.

(ii) *Liquidity*: Payment of dividends means outflow of cash. Ability to pay dividends depends on cash and liquidity position of the firm. A mature company does not have much investment opportunities, nor are funds tied up in permanent working capital and, therefore has a sound cash position. For a growth oriented company in spite of good profits, it will need funds for expanding activities and permanent working capital and therefore it is not in a position to declare dividends.

(iii) *Access to the Capital Market*: By paying large dividends, cash position is affected. If new shares have to be issued to raise funds for financing investment programmes and if the existing shareholders cannot buy additional shares, control is diluted. Payment of dividends may be withheld and earnings are utilised for financing firm's investment opportunities.

(iv) *Investment Opportunities*: If investment opportunities are inadequate, it is better to pay dividends and raise external funds whenever necessary for such opportunities.

**(c) Desire of Shareholders:** The desire of shareholders (whether they prefer regular income by way of dividend or maximize their wealth by way of gaining on sale of the shares). In this connection it is to be noted that as per the current provisions of the Income Tax Act, 1961, tax on dividend is borne by the companies as dividend distribution tax and shareholders need not pay any tax on income received by way of dividend from domestic companies. The small shareholders are concerned with regular dividend income hence select shares of companies paying regular and liberal dividend.

As compared to those shareholders who prefer regular dividend as source of income, there are shareholders who prefer to gain on sale of shares at times when shares command higher price in the market. However capital gain on sale of shares attracts tax on such gain and rate vary on the basis of holding period.

The dividend policy, thus pursued by the company should strike a balance on the desires of the shareholders. Also the dividend policy once established should be continued as long as possible without interfering with the needs of the company to create clientele effect.

**(d)   Stability of Dividends:**  Stability in dividend can be maintaining either fixing amount or rate of dividend irrespective of earnings of the company. The stable dividend policies may include:

**(i)   *Constant Dividend per Share*:** Shareholders are given fixed amount of dividend irrespective of actual earnings. The amount of dividend may increase or decrease later on depending upon the financial health of the company but it will be maintained far a considerable period.
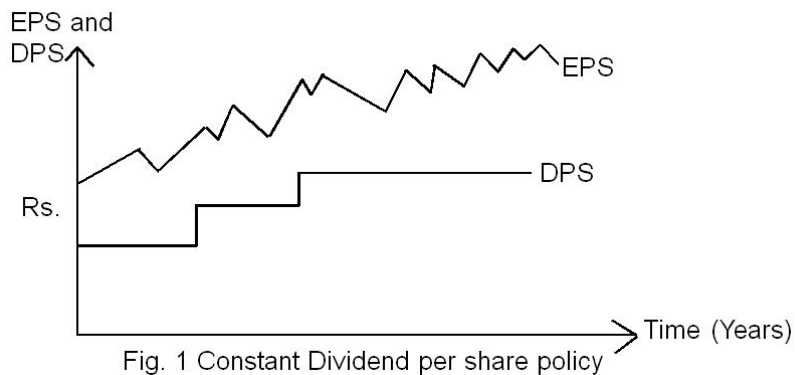


Fig. 1 Constant Dividend per share policy

To maintain a constant dividend amount, it is necessary to create a reserve like Dividend Equalisation Reserve Fund earmarked by marketable securities for accumulation of surplus earnings and to use for paying dividends in bad years. This policy treats common shareholders at par with preference shareholders without giving them any preferred opportunities within the firm. It is preferred by persons and institutions that depend on dividend income to meet living and operating expenses.

**(ii)   *Constant Percentage of Net Earnings*:** The ratio of dividend to earnings is known as Payout ratio. Some companies follow a policy of constant Payout ratio i.e. paying fixed percentage on net earnings every year. To quote from Page 74 of the annual report 2011 of Infosys Technologies Limited,

"The Dividend Policy is to distribute up to 30% of the Consolidated Profit after Tax (PAT) of the Infosys Group as Dividend."

Contrast to this Warren Buffet (amongst the richest persons of the world) says:

"We will either pay large dividends or none at all if we can't obtain more money through re-investment (of those funds). There is no logic to regularly paying out 10% or 20% of earnings as dividends every year."

Such a policy envisages that the amount of dividend fluctuates in direct proportion to earnings. If a company adopts 40% payout ratio, then 40% of every rupee of net earnings will be paid out. If a company earns ₹ 2/- per share, dividend per share will be 80 paise and if it earns ₹ 1.50 per share, dividend per share will be 60 paise.

Such a policy is related to company's ability to pay dividends. For losses incurred, no dividend shall be paid. Internal financing with retained earnings is automatic. At any given payout ratio, amount of dividends and any additions to retained earnings increase with increased earnings and decrease with decreased earnings. This policy has a conservative approach and provides a guarantee against over/underpayment. Management is not allowed to pay dividend if profits are not earned in current year and at the same time, dividend is not allowed to forego if profits are earned.

(iii) ***Small Constant Dividend per Share plus Extra Dividend***: The amount of dividend is set at high level and the policy is adopted for companies with stable earnings. For companies with fluctuating earnings, the policy is to pay a minimum dividend per share with a step up feature. The small amount of dividend is fixed to reduce the possibility of missing dividend payment. By paying extra dividend in period of prosperity, it enables the company to pay constant amount of dividend regularly without default and allows flexibility for supplementing shareholders' income when company's earnings are higher than usual, without committing to make larger payments as part of further fixed dividend. This policy allows some shareholders to plan on set amounts of cash and at the same time be pleased when extra dividends are announced.

A firm following policy of stable dividend in Figure1 will command higher market price for shares than firm which varies dividend with cyclical fluctuation in earnings as in Figure 2.
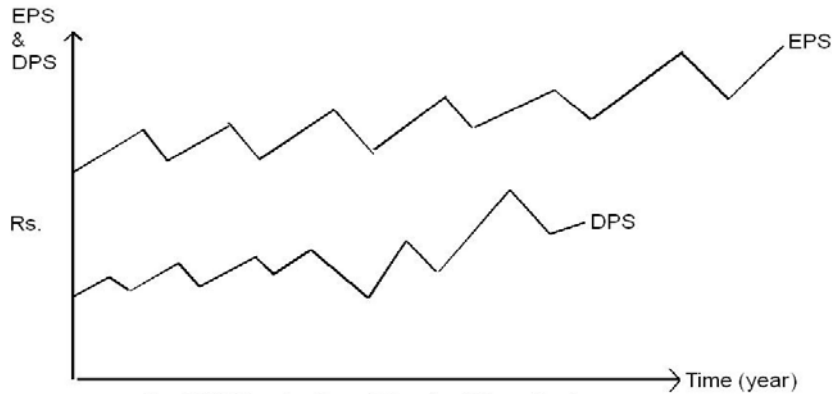
Fig. 2 Dividend policy at Constant Payout ratio

There is, however, a danger of a company with a pattern of stable dividends missing dividend payment in a year as this break will have severe effect on investors than failure to pay dividend by a company with unstable dividend policy. It is prudent for companies to maintain stability of dividends during lean periods. The dividend rate is to be fixed at a conservative figure so that it can be maintained even in such periods. To give benefit of company's prosperity extra dividend can be declared. When the company fails to pay extra dividend, it does not have a depressing effect on investors.

# 9.8 THEORIES OF DIVIDEND
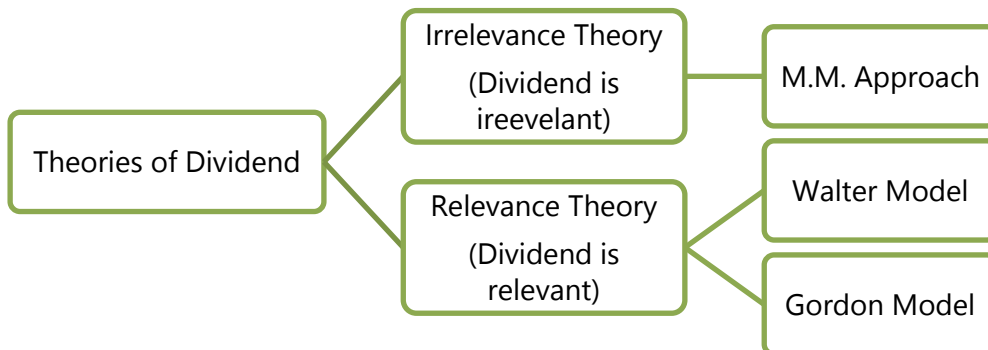


## 9.8.1 Dividend's Irrelevance Theory

## 1. MODIGLIANI and MILLER (M.M) HYPOTHESIS:

Modigliani – Miller theory was proposed by Franco Modigliani and Merton Miller in 1961. MM approach is in support of the irrelevance of dividends i.e. firm's dividend policy has no effect on either the price of a firm's stock or its cost of capital.

## Assumptions of M.M Hypothesis

MM hypothesis is based on the following assumptions:

- **Perfect capital markets**: The firm operates in a market in which all investors are rational and information is freely available to all.

- **No taxes or no tax discrimination** between dividend income and capital appreciation (capital gain): This assumption is necessary for the universal applicability of the theory, since, the tax rates or provisions to tax income may be different in different countries.

- **Fixed investment policy**: It is necessary to assume that all investment should be financed through equity only, since, implication after using debt as a source of finance may be difficult to understand. Further, the impact will be different in different cases.

- **No floatation or transaction cost**: Similarly, these costs may differ country to country or market to market.

- **Risk of uncertainty does not exist**. Investors are able to forecast future prices and dividend with certainty and one discount rate is appropriate for all securities and all time periods.

According to MM hypothesis

- Market value of equity shares of its firm depends solely on its earning power and is not influence by the manner in which its earnings are split between dividends and retained earnings.

- **Market value of equity shares is not affected by dividend size.**

MM hypothesis is primarily based on the arbitrage argument. Through the arbitrage process, MM hypothesis discusses how the value of the firm remains same whether the firm pays dividend or not. Here

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

Where,

$P_o$ = Price in the beginning of the period.

$P_1$ = Price at the end of the period.

$D_1$ = Dividend at the end of the period.

$K_e$ = Cost of equity/ rate of capitalization/ discount rate.

As per MM hypothesis, the value of firm will remain unchanged due to dividend decision. This can be computed with the help of the following formula:

$$V_f \text{ or } nP_0 = \frac{(n + \Delta n)P_1 - I + E}{(1 + K_e)}$$

Where,

| | | |
|---|---|---|
| $V_f$ | = | Value of firm in the beginning of the period |
| n | = | number of shares in the beginning of the period |
| $\Delta n$ | = | number of shares issued to raise the funds required |
| I | = | Amount required for investment |
| E | = | total earnings during the period |

For Understanding purpose:

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

The above equation is for one share. Let's multiply it with n i.e. existing number of shares on both sides:

$$nP_o = \frac{nP_1 + nD_1}{1 + K_e}$$

now add $\Delta nP_1$ and subtract $\Delta nP_1$ at numerator of the right hand side equation

$$nP_o = \frac{nP_1 + nD_1 + \Delta nP_1 - \Delta nP_1}{1 + K_e}$$

retained earnings could be represented with the help of following:

Retained earnings = $E - nD_1$

$\Delta n$ i.e. number of shares issued to raise the funds required can be represented as follows:

$$\Delta n = \frac{\text{Funds required}}{\text{Price at end } (P_1)} = \frac{1 - (E - nD_1)}{P_1}$$

$$\Delta nP_1 = I - (E - nD_1)$$

Now let's use this for the equation

$$nP_o = \frac{nD_1 + (NP_1 + \Delta nP_1) - [1 - (E - nD_1)]}{1 + K_e}$$

$$nP_o = \frac{nD_1 + (n + \Delta n)P_1 - I + E - nD_1}{1 + K_e}$$

$$nP_o = \frac{(n + \Delta n)P_1 - I + E}{1 + K_e}$$

## Advantages of MM Hypothesis

Various advantages of MM Hypothesis are as follows

1.  This model is **logically consistent.**

2.  It provides a **satisfactory framework** on dividend policy with the the concept of Arbitrage process.

## Limitations of MM Hypothesis

Various Limitations of MM Hypothesis are as follows

1.  Validity of various **assumptions is questionable.**

2.  This model **may not be valid under uncertainty**.

### ILLUSTRATION 1

*AB Engineering Ltd. belongs to a risk class for which the capitalization rate is 10%. It currently has outstanding 10,000 shares selling at ₹ 100 each. The firm is contemplating the declaration of a dividend of ₹ 5/ share at the end of the current financial year. It expects to have a net income of ₹ 1,00,000 and has a proposal for making new investments of ₹ 2,00,000. CALCULATE the value of the firms when dividends (i) are not paid (ii) are paid*

### SOLUTION

**CASE 1: Value of the firm when dividends are not paid.**

Step 1: Calculate price at the end of the period

$K_e = 10\%$,     $P_0 = 100$,     $D_1 = 0$

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

$$100 = \frac{P_1 + 0}{1 + 0.10} \quad » \quad P_1 = 110$$

Step 2: Calculation of funds required for investment

| Earning | ₹ 1,00,000 |
|---|---|
| Dividend distributed | Nil |
| Fund available for investment | ₹ 1,00,000 |
| Total Investment | ₹ 2,00,000 |
| Balance Funds required | ₹ 2,00,000 - ₹1,00,000 = ₹1,00,000 |

Step 3: No. of shares required to be issued for balance fund

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$$

$$\Delta n = \frac{1,00,000}{110}$$

Step 4: Calculation of value of firm

$$nP_o = \frac{(n + \Delta n)P_1 - I + E}{1 + K_e}$$

$$nP_0 = \frac{\left(10,000 + \dfrac{₹1,00,000}{₹110}\right) \times ₹110 - ₹2,00,000 + ₹1,00,000}{(1 + 0.10)}$$

$$= ₹ 10,00,000$$

**CASE 2: Value of the firm when dividends are paid.**

Step 1: Calculate price at the end of the period

$$K_e = 10\%, \qquad P_0 = 100, \qquad D_1 = 5$$

$$P_o = \frac{P_1 + D_1}{1 + K_e}$$

$$100 = \frac{P_1 + 5}{1 + 0.10} \quad » \quad P_1 = 105$$

Step 2: Calculation of funds required for investment

| Earning | ₹ 1,00,000 |
|---|---|
| Dividend distributed | ₹ 50,000 |
| Fund available for investment | ₹ 50,000 |
| Total Investment | ₹ 2,00,000 |
| Balance Funds required | ₹ 2,00,000 - ₹ 50,000 = ₹1,50,000 |

Step 3: No. of shares required to be issued for balance fund

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$$

$$\Delta n = \frac{₹1,50,000}{₹105}$$

Step 4: Calculation of value of firm

$$nP_o = \frac{(n+\Delta n)P_1 - I + E}{1 + K_e}$$

$$nP_0 = \frac{\left(10,000 + \dfrac{₹1,50,000}{₹105}\right) \times ₹105 - ₹2,00,000 + ₹1,00,000}{(1+0.10)}$$

$$= ₹10,00,000$$

**Thus, it can be seen from the example that the value of the firm remains the same in either case.**

### 9.8.2 Dividend's Relevance Theory

**1.    WALTER'S MODEL**

### Assumptions of Walter's Model

Walter's approach is based on the following assumptions:

- All investment proposals of the firm are to be financed **through retained earnings** only

- **'r'** rate of return & **'K$_e$'** cost of **capital are constant**

- **Perfect capital markets**: The firm operates in a market in which all investors are rational and information is freely available to all.

- **No taxes or no tax discrimination** between dividend income and capital appreciation (capital gain): This assumption is necessary for the universal applicability of the theory, since, the tax rates or provisions to tax income may be different in different countries.

- **No floatation or transaction cost**: Similarly, these costs may differ country to country or market to market.

- The firm has **perpetual life**

The relationship between dividend and share price based on Walter's formula is shown below:

$$\text{Market Price}(P) \quad = \quad \frac{D + \dfrac{r}{K_e}(E - D)}{K_e}$$

Where,

P = Market Price of the share.

E = Earnings per share.

D = Dividend per share.

$K_e$ = Cost of equity/ rate of capitalization/ discount rate.

r = Internal rate of return/ return on investment

The above formula is given by Prof. James E. Walter shows how dividend can be used to maximise the wealth of equity holders. He argues that in the long run, share prices reflect only the present value of expected dividends. Retentions influence stock prices only through their effect on further dividends.

A close study of the formula indicates that Professor Walter emphasises two factors which influence the market price of a share.

1) Dividend per share

2) Relationship between Internal Rate of Return (IRR) and Cost of capital ($K_e$)/ Market capitalization rate

If the internal return of retained earnings is higher than market capitalization rate, the value of ordinary shares would be high even if dividends are low. However, if the internal return within the business is lower than what the market expects, the value of the share would be low. In such a case, shareholders would prefer a higher

dividend so that they can utilise the funds so obtained elsewhere in more profitable opportunities.

Walter's Model explains why market prices of shares of growing companies are high even though the dividend paid out is low. It also explains why the market price of shares of certain companies which pay higher dividends and retain very low profits is also high.

As explained above, market price is dependent upon two factors; firstly, the quantum of dividend and secondly, profitable opportunities available to the company in investing the earnings retained. It is obvious that when a company retains a part of its profits, it has to think in terms of the cost of such retention. Retention of profits depends upon whether it is cheaper and more profitable for shareholders of the company to have corporate earnings retained in the business or get the same in the form of cash dividend. This involves a comparison between the cost of retained earnings and the cost of distributing them. The cost of retained earnings, therefore, involves an opportunity cost, i.e., the benefits which shareholders forego in terms of leaving the funds in the business.

### IRR, $K_e$ and optimum payout

As we know Walter approach consider two factors, following is the conclusion of Walter's model

| Company | Condition of r vs $K_e$ | Correlation between Size of Dividend and Market Price of share | Optimum dividend payout ratio |
|---------|------------------------|--------------------------------------------------------------|-------------------------------|
| Growth | r > $K_e$ | Negative | Zero |
| Constant | r = $K_e$ | No correlation | Every payout ratio is optimum |
| Decline | r < $K_e$ | Positive | 100% |

**Growth Company**: In this condition company is able to invest/utilize the fund in a better manner. In this case shareholders can accept low dividend because their value of share would be higher.

**Decline Company**: In this case company is not in a position to cover the cost of capital; in such case shareholders would prefer a higher dividend so that they can utilize their funds elsewhere in more profitable opportunities.

## Advantages of Walter's Model

1. The formula is **simple to understand** and easy to compute.

2. It can envisage **different possible market prices** in different situations and considers internal rate of return, market capitalisation rate and dividend payout ratio in the determination of market value of shares.

## Limitations of Walter's Model

1. The formula **does not consider all the factors** affecting dividend policy and share prices. Moreover, determination of market capitalisation rate is difficult.

2. Further, the formula **ignores such factors as taxation,** various legal and contractual obligations, management policy and attitude towards dividend policy and so on.

### ILLUSTRATION 2

*XYZ Ltd. earns ₹ 10/ share. Capitalization rate and return on investment are 10% and 12% respectively.*

*DETERMINE the optimum dividend payout ratio and the price of the share at the payout.*

### SOLUTION

Since $r > K_e$ , the optimum dividend pay-out ratio would 'Zero' (i.e. D = 0),

Accordingly, value of a share:

$$P = \frac{D + \dfrac{r}{Ke}(E - D)}{K_e}$$

$$P = \frac{0 + \dfrac{0.12}{0.10}(10 - 0)}{0.10} = ₹120$$

The optimality of the above payout ratio can be proved by using 25%, 50%, 75% and 100% as pay-out ratio:

**At 25% pay-out ratio**

$$P = \frac{2.5 + \dfrac{0.12}{0.10}(10 - 2.5)}{0.10} = ₹115$$

**At 50% pay-out ratio**

$$P = \frac{5 + \dfrac{0.12}{0.10}(10 - 5)}{0.10} = ₹110$$

**At 75% pay-out ratio**

$$P = \frac{7.5 + \dfrac{0.12}{0.10}(10 - 7.5)}{0.10} = ₹105$$

**At 100% pay-out ratio**

$$P = \frac{10 + \dfrac{0.12}{0.10}(10 - 10)}{0.10} = ₹100$$

## ILLUSTRATION 3

*The following figures are collected from the annual report of XYZ Ltd.:*

|  |  |
|---|---|
| *Net Profit* | *₹ 30 lakhs* |
| *Outstanding 12% preference shares* | *₹ 100 lakhs* |
| *No. of equity shares* | *3 lakhs* |
| *Return on Investment* | *20%* |
| *Cost of capital i.e. ($K_e$)* | *16%* |

*COMPUTE the approximate dividend pay-out ratio so as to keep the share price at ₹ 42 by using Walter's model?*

## SOLUTION

|  | **₹ in lakhs** |
|---|---|
| Net Profit | 30 |
| Less: Preference dividend | 12 |
| Earning for equity shareholders | 18 |
| Therefore earning per share | 18/3 = ₹ 6.00 |

Let, the dividend per share be D to get share price of ₹42

$$P \quad = \quad \frac{D + \dfrac{r}{K_e}(E - D)}{K_e}$$

$$₹42 \quad = \quad \frac{D + \dfrac{0.20}{0.16}(6 - D)}{0.16}$$

$$6.72 \quad = \quad \frac{0.16D + 1.2 - 0.20D}{0.16}$$

$0.04D \quad = 1.2 - 1.0752$

$D \quad = 3.12$

$$\text{D/P ratio} \quad = \quad \frac{DPS}{EPS} \times 100 \quad = \quad \frac{3.12}{6} \times 100 \ = 52\%$$

So, the required dividend payout ratio will be = 52%

## 2.    GORDON'S MODEL

According to Gordon's model dividend is relevant and dividend policy of a company affects its value.

## Assumptions of Gordon's Model

This model is based on the following assumptions:

- Firm is an all equity firm i.e. **no debt.**

- **IRR will remain constant**, because change in IRR will change the growth rate and consequently the value will be affected. Hence this assumption is necessary.

- **$K_e$ will remains constant**, because change in discount rate will affect the present value.

- **Retention ratio** (b), once decide upon, is **constant** i.e. constant dividend payout ratio will be followed.

- **Growth rate** (g = br) is also **constant**, since retention ratio and IRR will remain unchanged and growth, which is the function of these two variable will remain unaffected.

- $K_e > g$, this assumption is necessary and based on the principles of series of sum of geometric progression for 'n' number of years.

- All investment proposals of the firm are to be **financed through retained earnings** only.

**The following formula is used by Gordon to find out price per share:**

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

Where,

P$_0$ = Price per share

E$_1$ = Earnings per share

b = Retention ratio; (1 - b = Payout ratio)

K$_e$ = Cost of capital

r = IRR

br = Growth rate (g)

According to Gordon's model, when **IRR is greater than cost of capital, the price per share increases and dividend pay-out decreases**. On the other hand when IRR is lower than the cost of capital, the price per share decreases and dividend pay-out increases.

Following is the conclusion of Gordon's model

| Company | Condition of r vs $K_e$ | Optimum dividend payout ratio |
|---|---|---|
| Growth | r > $K_e$ | Zero |
| Constant | r = $K_e$ | There is no optimum ratio |
| Declining | r < $K_e$ | 100% |

**ILLUSTRATION 4**

*The following figures are collected from the annual report of XYZ Ltd.:*

| | |
|---|---|
| *Net Profit* | *₹ 30 lakhs* |
| *Outstanding 12% preference shares* | *₹ 100 lakhs* |

| | |
|---|---|
| *No. of equity shares* | *3 lakhs* |
| *Return on Investment* | *20%* |
| *Cost of capital i.e. ($K_e$)* | *16%* |

*CALCULATE price per share using Gordon's Model when dividend pay-out is (i) 25%; (ii) 50% and (iii) 100%.*

**SOLUTION**

| | **₹ in lakhs** |
|---|---|
| Net Profit | 30 |
| Less: Preference dividend | 12 |
| Earning for equity shareholders | 18 |
| Therefore earning per share | 18/3 = ₹ 6.00 |

Price per share according to Gordon's Model is calculated as follows:

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

Here, E1 = 6, Ke =

(i) When dividend pay-out is 25%

$$P_0 = \frac{6 \times 0.25}{0.16 - (0.75 \times 0.2)} = \frac{1.5}{0.16 - 0.15} = 150$$

(ii) When dividend pay-out is 50%

$$P_0 = \frac{6 \times 0.5}{0.16 - (0.5 \times 0.2)} = \frac{3}{0.16 - 0.10} = 50$$

(iii) When dividend pay-out is 100%

$$P_0 = \frac{6 \times 1}{0.16 - (0 \times 0.2)} = \frac{6}{0.16} = 37.50$$

## The "Bird-in-hand theory"

Myron Gordon revised his dividend model and considered the risk and uncertainty in his model. The Bird-in-hand theory of Gordon has two arguments:

(i) Investors are **risk averse** and

(ii) Investors put a **premium on certain return** and discount on uncertain return.

Gordon argues that what is available at present is preferable to what may be available in the future. As investors are rational, they want to avoid risk and uncertainty. They would prefer to pay a higher price for shares on which current dividends are paid. Conversely, they would discount the value of shares of a firm which postpones dividends. The discount rate would vary with the retention rate.

The relationship between dividend and share price on the basis of Gordon's formula is shown as:

$$\text{Market price per share} (P_0) = \left[ \frac{D_0(1+g)}{K_e - g} \right]$$

Where,

|  |  |  |
|---|---|---|
| $P_0$ | = | Market price per share (ex-dividend) |
| $D_o$ | = | Current year dividend |
| $g$ | = | Constant annual growth rate of dividends |
| $K_e$ | = | Cost of equity capital (expected rate of return). |

The formula given by Gordon shows that when the rate of return (r) is greater than the discount rate ($K_e$), the price per share increases as the dividend ratio decreases and if the return (r) is less than discount rate ($K_e$) it is vice-versa. The price per share remains unchanged where the rate of return and discount rate are equal.

## DIVIDEND DISCOUNT MODEL (DDM)

It is a financial model that values shares at the discounted value of the future dividend payments. Under this model, the price of a share will be traded is calculated by the PV of all expected future dividend payment discounted by an appropriate risk- adjusted rate. The dividend discount model price is the intrinsic value of the stock i.e.

**Intrinsic value = Sum of PV of future cash flows**

**Intrinsic value = Sum of PV of Dividends + PV of Stock Sale Price**

$$\text{Stock Intrinsic Value} = \frac{D_1}{(1+K_e)^1} + \frac{D_2}{(1+K_e)^2} + ..... + \frac{D_n}{(1+K_e)^n} + \frac{RV_n}{(1+K_e)^n}$$

In the above equation, it is assumed that dividend is paid at the end of each year and that the stock is sold at the end of the nth year.

### Dividend Discount Model (DDM)

There can three possible situations:

```
              Dividend Discount Model
        ┌──────────────┬──────────────┐
   Zero Growth   Constant Growth   Variable Growth
```

**(a) Zero growth rates**: assumes all dividend paid by a stock remains same. In this case the stock price would be equal to:

$$\text{Stock's intrinsic Value} = \frac{\text{Annual dividend}}{\text{Requied rate of return}}$$

$$\text{i.e.} \quad P_0 = \frac{D}{K_e}$$

Where,

D = Annual dividend

$K_e$ = Cost of capital

$P_0$ = Current Market price of share

### ILLUSTRATION 5

*X Ltd. is a no growth company, pays a dividend of ₹ 5 per share. If the cost of capital is 10%, COMPUTE the current market price of the share?*

### SOLUTION

$$P_0 = \frac{D}{K_e} = \frac{5}{0.10} = ₹\,50$$

**(b) Constant Growth Rate (Gordon's Growth Model):** The relationship between dividend and share price on the basis of Gordon's formula is:

$$\text{Market price per share (P)} = \frac{D_0(1+g)}{K_e - g}$$

Where

P = Market price per share

$D_0$ = current year dividend

g = growth rate of dividends

$K_e$ = cost of equity capital/ expected rate of return

Notes:

g = b × r

b = proportion of retained earnings or (1- dividend payout ratio)

## ILLUSTRATION 6

*XYZ is a company having share capital of ₹10 lakhs of ₹10 each. It distributed current dividend of 20% per annum. Annual growth rate in dividend expected is 2%. The expected rate of return on its equity capital is 15%. CALCULATE price of share applying Gordons growth Model.*

## SOLUTION

P $\quad=\quad$ $\dfrac{D_0(1+g)}{K_e - g}$

$D_0$ $\quad=\quad$ 10 × 20% = ₹2

g $\quad=\quad$ 2% or 0.02

$K_e$ $\quad=\quad$ 15% or 0.15

P $\quad=\quad$ $\dfrac{2(1+0.02)}{0.15 - 0.02}$

$\quad=\quad$ ₹15.69

**(c) Variable growth rate :** Variable-growth rate models (multi-stage growth models) can take many forms, even assuming the growth rate is different for every year. However, the most common form is one that assumes 3 different rates of growth: an initial high rate of growth, a transition to slower growth, and lastly, a sustainable, steady rate of growth. Basically, the constant-growth rate model is extended, with each phase of growth calculated using the constant-growth method, but using 3 different growth rates of the 3 phases. The present values of each stage are added together to derive the intrinsic value of the stock. Sometimes, even the capitalization rate, or the required rate of return, may be varied if changes in the rate are projected.

## ILLUSTRATION 7

*A firm had been paid dividend at ₹2 per share last year. The estimated growth of the dividends from the company is estimated to be 5% p.a. DETERMINE the estimated market price of the equity share if the estimated growth rate of dividends (i) rises to 8%, and (ii) falls to 3%. Also FIND OUT the present market price of the share, given that the required rate of return of the equity investors is 15%.*

## SOLUTION

In the present situation, the current MPS is as follows:

$$P = \frac{D_0(1+g)}{K_e - g}$$

$$P = \frac{2(1+0.05)}{0.15 - 0.05}$$

$$= ₹\,21$$

(i)  The impact of changes in growth rate to 8% on MPS will be as follows:

$$P = \frac{2(1+0.08)}{0.15 - 0.08}$$

$$= ₹\,30.86$$

(ii)  The impact of changes in growth rate to 3% on MPS will be as follows:

$$P = \frac{2(1+0.03)}{0.15 - 0.03}$$

$$= ₹\,17.17$$

So, the market price of the share is expected to vary in response to change in expected growth rate is dividends.

### Advantages of Gordon's Model

1.  The dividend discount model is a **useful heuristic model** that relates the present stock price to the present value of its future cash flows.

2.  This Model is **easy to understand.**

## Limitations of Gordon's Model

1.  The dividend discount model **depends** on projections about company growth rate and future capitalization rates of the remaining cash flows, which may be **difficult to calculate accurately.**

2.  The **true intrinsic value** of a stock is **difficult to determine** realistically.,

### 9.8.3. Traditional Model

**1.    Graham & Dodd Model**

According to the traditional position expounded by Graham & Dodd, the stock market places considerably more weight on dividends than on retained earnings. Their view is expressed quantitatively in the following valuation model:

$$P = m\left(D + \frac{E}{3}\right)$$

Where,

P = Market price per share

D = Dividend per share

E = Earnings per share

m = a multiplier

### ILLUSTRATION 8

*The earnings per share of a company is ₹ 30 and dividend payout ratio is 60%. Multiplier is 2.*

*DETERMINE the price per share as per Graham & Dodd model.*

### SOLUTION

Price per share (P) = $m\left(D + \frac{E}{3}\right)$

P = $2\left(30 \times 0.6 + \frac{30}{3}\right)$

P = $2(18 + 10) = $ ₹ 56

### ILLUSTRATION 9

*The following information regarding the equity shares of M Ltd. is given below:*

| Market price | ₹ 58.33 |
|---|---|
| Dividend per share | ₹ 5 |
| Multiplier | 7 |

*According to the Graham & Dodd approach to the dividend policy, COMPUTE the EPS.*

**SOLUTION**

Price per share (P) = $m\left(D + \dfrac{E}{3}\right)$

₹58.33 = $7\left(5 + \dfrac{E}{3}\right)$

105 + 7E = 175

Or, 7E = 175 -105 = ₹10

Therefore, EPS = ₹10

**2. Linter's Model**

Linter's model has two parameters:

i.     The target payout ratio,

ii.    The spread at which current dividends adjust to the target.

John Linter based his model on a series of interviews which he conducted with corporate managers in the mid 1950's.While developing the model, he considers the following assumptions:

1.     Firm have a **long term dividend payout ratio**. They maintain a fixed dividend payout over a long term. Mature companies with stable earnings may have high payouts and growth companies usually have low payouts.

2.     *Managers are more concerned with changes in dividends* than the absolute amounts of dividends. A manager may easily decide to pay a dividend of ₹ 2 per share if last year too it was ₹ 2 but paying ₹ 3 dividend if last year dividend was ₹2 is an important financial management decision.

3.     Dividend changes follow changes in long run sustainable earnings.

4.     Managers are **reluctant to affect dividend changes** that may have to be reversed.

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Under Linter's model, the current year's dividend is dependent on current year's earnings and last year's dividend.

$$D_1 = D_o + [(EPS \times Target\ payout) - D_o] \times Af$$

Where

$D_1$ = Dividend in year 1

$D_o$ = Dividend in year 0 (last year dividend)

EPS = Earnings per share

Af = Adjustment factor or Speed of adjustment

## ILLUSTRATIONS 10

*Given the last year's dividend is ₹ 9.80, speed of adjustment = 45%, target payout ratio 60% and EPS for current year ₹ 20. COMPUTE current year's dividend using Linter's model.*

## SOLUTION

$D_1 = D_o + [(EPS \times Target\ payout) - D_o] \times Af$

$D_1 = 9.80 + [(20 \times 60\%) - 9.80] \times 0.45$

$D_1 = 9.80 + 0.99 = ₹10.79$

### Criticism of Linter's Model:

- This model **does not offer a market price** for the shares.

- The **adjustment factor is an arbitrary number** and not based on any scientific criterion or method.

# 9.9 STOCK SPLITS

### 9.9.1 Meaning of Stock Split:

Stock split means splitting **one share into many,** say, one share of ₹500 in to 5 shares of ₹100. Stock splits is a tool used by the companies to regulate the prices of shares i.e. if a share price increases beyond a limit, it may become less tradable, for e.g. suppose a company's share price increases from ₹50 to ₹1000 over the years, it is possible that it might goes out of range of many investors.

### 9.9.2 Advantages of Stock Splits

Various advantages of Stock Splits are as follows:

1.    It makes the **share affordable** to small investors.

2.    **Number of shares may increase** the number of shareholders; hence the potential of investment may increase.

### 9.9.3 Limitations of Stock Splits

Various limitations of Stock Splits are as follows:

1.    **Additional expenditure** need to be incurred on the process of stock split.

2.    **Low share price may attract speculators** or short term investors, which are generally not preferred by any company.

### Miscellaneous Illustration

**ILLUSTRATION 11**

*RST Ltd. has a capital of ₹ 10,00,000 in equity shares of ₹ 100 each. The shares are currently quoted at par. The company proposes to declare a dividend of ₹ 10 per share at the end of the current financial year. The capitalization rate for the risk class of which the company belongs is 12%. COMPUTE market price of the share at the end of the year, if*

*(i)     dividend is not declared ?*

*(ii)    dividend is declared ?*

*(iii)   assuming that the company pays the dividend and has net profits of ₹5,00,000 and makes new investments of ₹10,00,000 during the period, how many new shares must be issued? Use the MM model.*

**SOLUTION**

Given,

| | |
|---|---:|
| Cost of Equity ($K_e$) | 12% |
| Number of shares in the beginning (n) | 10,000 |
| Current Market Price ($P_0$) | ₹100 |
| Net Profit (E) | ₹ 5,00,000 |
| Expected Dividend | ₹10 per share |
| Investment (I) | ₹10,00,000 |

Computation of market price per share, when:

**(i)  No dividend is declared:**

$$P_0 = \frac{P_1 + D_1}{1 + K_e}$$

$$100 = \frac{P_1 + 0}{1 + 0.12}$$

$$P_1 = 112 - 0 = ₹112$$

**(ii)  Dividend is declared:**

$$100 = \frac{P_1 + 10}{1 + 0.12}$$

$$P_1 = 112 - 10 = ₹102$$

**(iii)  Calculation of funds required for investment**

| | |
|---|---|
| Earning | 5,00,000 |
| Dividend distributed | 1,00,000 |
| Fund available for investment | 4,00,000 |
| Total Investment | 10,00,000 |
| Balance Funds required | 10,00,000 - 4,00,000  = ₹6,00,000 |

$$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$$

$$\Delta n = \frac{6,00,000}{102} = 5882.35 \text{ or } 5883 \text{ Shares}$$

## ILLUSTRATION 12

*The following information pertains to M/s XY Ltd.*

| | |
|---|---|
| *Earnings of the Company* | *₹ 5,00,000* |
| *Dividend Payout ratio* | *60%* |
| *No. of shares outstanding* | *1,00,000* |
| *Equity capitalization rate* | *12%* |
| *Rate of return on investment* | *15%* |

*CALCULATE:*

*(i)* *What would be the market value per share as per Walter's model?*

*(ii)* *What is the optimum dividend payout ratio according to Walter's model and the market value of Company's share at that payout ratio?*

**SOLUTION**

(i) Walter's model is given by

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

Where

P = Market price per share.

E = Earnings per share = ₹ 5

D = Dividend per share = ₹ 3

R = Return earned on investment = 15%

$K_e$ = Cost of equity capital = 12%

$$P = \frac{3 + \frac{0.15}{0.12}(5 - 3)}{0.12} = ₹ 45.83$$

(ii) According to Walter's model when the return on investment is more than the cost of equity capital, the price per share increases as the dividend pay-out ratio decreases. Hence, the optimum dividend pay-out ratio in this case is nil.

So, at a pay-out ratio of zero, the market value of the company's share will be:

$$P = \frac{0 + \frac{0.15}{0.12}(5 - 0)}{0.12} = ₹ 52.08$$

**ILLUSTRATION 13**

*Again taking an example of three different firms i.e. growth, normal and declining firm. CALCULATE the Gordon's model with the help of a following example:*

| Factors | Growth Firm | Normal Firm | Declining Firm |
|---|---|---|---|
| | $r > K_e$ | $r = K_e$ | $r < K_e$ |
| r (rate of return on retained earnings) | 15% | 10% | 8% |
| $K_e$ (Cost of Capital) | 10% | 10% | 10% |
| E (Earning Per Share) | ₹ 10 | ₹ 10 | ₹ 10 |
| b (Retained Earnings) | 0.6 | 0.6 | 0.6 |
| 1- b | 0.4 | 0.4 | 0.4 |

## SOLUTION

$$P_0 = \frac{E_1(1-b)}{K_e - br}$$

**(i) Situation-1: Growth Firm $r > K_e$**

$$P_0 = \frac{10(1-0.6)}{0.10-0.15\times0.6} = \frac{4}{0.10-0.09} = ₹400$$

**(ii) Situation-2: Normal Firm $r = K_e$**

$$P_0 = \frac{10(1-0.6)}{0.10-0.10\times0.6} = \frac{4}{0.10-0.09} = ₹100$$

**(ii) Situation-2: Normal Firm $r < K_e$**

$$P_0 = \frac{10(1-0.6)}{0.10-0.08\times0.6} = \frac{4}{0.10-0.048} = ₹76.92$$

If the retention ratio (b) is changed from 0.6 to 0.4, the new share price will be as follows:

Growth Firm

$$P_0 = \frac{10(1-0.4)}{0.10-0.15\times0.4} = \frac{6}{0.10-0.06} = ₹150$$

Normal Firm

$$P_0 = \frac{10(1-0.4)}{0.10-0.10\times0.4} = \frac{6}{0.10-0.04} = ₹ 100$$

Declining Firm

$$P_0 = \frac{10(1-0.4)}{0.10-0.08\times0.4} = \frac{6}{0.10-0.032} = ₹\ 88.24$$

From the above analysis it can be concluded that.

When r > k, the market value increases with retention ratio.

When r < k, the market value of share stands to decrease.

When r = k, the market value is not affected by dividend policy.

The conclusion of the Gordon's model is similar to that of Walter's model.

## SUMMARY

Dividend decision is one of the most important areas of management decisions. It is easy to understand but difficult to implement. Generally, the dividend can be in the form of Cash Dividend and Stock Dividend.

Dividend policy is generally governed by long term financing decision and wealth maximization decision. Some other factors also play major role in this decision like growth opportunities, expectation of shareholders, trend of the industry, legal constraints etc.

The three major theories of dividend decision are classified under irrelevance (M.M. Hypothesis) and relevance category (Walter's model & Gordon's Model). However, few other theories studied in this chapter are Graham & Dodd's model, Linter model, and residual payment policy.

Further, we studied stock splits as a tool to maintain price range so that it does not move too high to become unaffordable for a wide range of investors.

## TEST YOUR KNOWLEDGE

### MCQs based Questions

1     Which one of the following is the assumption of Gordon's Model:

(a)   Ke > g

(b)   Retention ratio (b),once decide upon,  is constant

(c)   Firm is an all equity firm

(d)   All of the above

2  What should be the optimum Dividend pay-out ratio, when r = 15% & $K_e$ = 12%:

(a)  100%

(b)  50%

(c)  Zero

(d)  None of the above.

3  Which of the following is the irrelevance theory?

(a)  Walter model

(b)  Gordon model

(c)  M.M. hypothesis

(d)  Linter's model

4  If the company's D/P ratio is 60% & ROI is 16%, what should be the growth rate:

(a)  5%

(b)  7%

(c)  6.4%

(d)  9.6%

5  If the shareholders prefer regular income, how does this affect the dividend decision:

(a)  It will lead to payment of dividend

(b)  It is the indicator to retain more earnings

(c)  It has no impact on dividend decision

(d)  Can't say

6  Mature companies having few investment opportunities will show high payout ratios, this statement is:

(a)  False

(b)  True

(c)  Partial true

(d)  None of these

7  Which of the following is the limitation of Linter's model:

(a)   This model does not offer a market price for the shares

(b)   The adjustment factor is an arbitrary number and not based on any scientific criterion or methods

(c)   Both a) & b)

(d)   None of the above.

## Theoretical based Questions

1.   STATE dividend decision? Briefly EXPLAIN the factors which govern this decision.

2.   EXPLAIN the advantages and disadvantages of the stock dividend.

3.   DISCUSS the practical considerations in dividend policy.

4.   LIST out the assumptions of irrelevance theory.

5.   EXPLAIN the parameters Linter's model of dividend policy. Also explain the reasons of its criticism.

## Practical Problem

1.   M Ltd. belongs to a risk class for which the capitalization rate is 10%. It has 25,000 outstanding shares and the current market price is ₹ 100. It expects a net profit of ₹ 2,50,000 for the year and the Board is considering dividend of ₹ 5 per share.

M Ltd. requires to raise ₹ 5,00,000 for an approved investment expenditure. ILLUSTRATE, how the MM approach affects the value of M Ltd. if dividends are paid or not paid.

2.   The following information is supplied to you:

|                                       | ₹        |
|---------------------------------------|----------|
| Total Earnings                        | 2,00,000 |
| No. of equity shares (of ₹ 100 each)  | 20,000   |
| Dividend paid                         | 1,50,000 |
| Price/ Earnings ratio                 | 12.5     |

Applying Walter's Model

(i)   ANALYSE whether the company is following an optimal dividend policy.

(ii)  COMPUTE P/E ratio at which the dividend policy will have no effect on the value of the share.

(iii)    Will your decision change, if the P/E ratio is 8 instead of 12.5? ANALY

3.    With the help of following figures CALCULATE the market price of a share of a company by using:

(i)    Walter's formula

(ii)    Dividend growth model (Gordon's formula)

| Earnings per share (EPS) | ₹ 10 |
| Dividend per share (DPS) | ₹ 6 |
| Cost of capital ($K_e$) | 20% |
| Internal rate of return on investment | 25% |
| Retention Ratio | 40% |

4.    The dividend payout ratio of H Ltd. is 40%. If the company follows traditional approach to dividend policy with a multiplier of 9, COMPUTE P/E ratio.

# ANSWERS/SOLUTIONS

## Answers to the MCQs based Questions

| 1. | (d) | 2. | (c) | 3. | (c) | 4. | (c) | 5 | (a) | 6 | (b) |
| 7. | (c) |

## Answers to Theoretical based Questions

**1.**    Please refer paragraph 10.2

**2.**    Please refer paragraph 10.4

**3.**    Please refer paragraph 10.3

**4.**    Please refer paragraph 10.8.1

**5.**    Please refer paragraph 10.8.3 (2)

## Answer of Practical Problems

1.    Given,

| Cost of Equity ($K_e$) | 10% |
| Number of shares in the beginning (n) | 25,000 |
| Current Market Price ($P_0$) | ₹100 |

| Net Profit (E) | ₹2,50,000 |
|---|---|
| Expected Dividend | ₹5 per share |
| Investment (I) | ₹5,00,000 |

| Case 1 - When dividends are paid | Case 2 - When dividends are not paid |
|---|---|
| **Step 1** | **Step 1** |
| $$P_o = \frac{P_1 + D_1}{1 + K_e}$$ $$100 = \frac{P_1 + 5}{1 + 0.10}$$ $$P_1 = 110 - 5 = 105$$ | $$P_o = \frac{P_1 + D_1}{1 + K_e}$$ $$100 = \frac{P_1 + 0}{1 + 0.10}$$ $$P_1 = 110 - 0 = 110$$ |
| **Step 3** | **Step 3** |
| No. of shares required to be issued for balance fund | No. of shares required to be issued for balance fund |
| $$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$$ $$\Delta n = \frac{3,75,000}{105}$$ $$= 3,571.4285$$ | $$\text{No. of shares} = \frac{\text{Funds required}}{\text{Price at end}(P_1)}$$ $$\Delta n = \frac{2,50,000}{110}$$ $$= 2,272.73$$ |
| **Step 4** | **Step 4** |
| Calculation of value of firm | Calculation of value of firm |
| $$Vf = \frac{(n + \Delta n)P_1 - I + E}{(1 + k_e)}$$ Vf= $$\frac{\left(25,000 + \dfrac{3,75,000}{105}\right)105 - 5,00,000 + 2,50,000}{(1 + .10)}$$ = ₹ 25,00,000 | $$Vf = \frac{(n + \Delta n)P_1 - I + E}{(1 + k_e)}$$ Vf = $$\frac{\left(25,000 + \dfrac{2,50,000}{110}\right)110 - 5,00,000 + 2,50,000}{(1 + 0.10)}$$ = ₹ 25,00,000 |

2.  **(i)** The EPS of the firm is ₹ 10 (i.e., ₹ 2,00,000/ 20,000).  r = 2,00,000/ (20,000 shares × ₹100) = 10%. The P/E Ratio is given at 12.5 and the cost of capital, $K_e$, may be taken at the inverse of P/E ratio.  Therefore, $K_e$ is 8 (i.e., 1/12.5). The firm is distributing total dividends of ₹ 1,50,000 among 20,000 shares, giving a dividend per share of ₹ 7.50.  the value of the share as per Walter's model may be found as follows:

$$P = \frac{D + \dfrac{r}{K_e}(E-D)}{K_e} = \frac{7.5 + \dfrac{0.1}{0.08}(10 - 7.5)}{0.08} = ₹\ 132.81$$

The firm has a dividend payout of 75% (i.e., ₹ 1,50,000) out of total earnings of ₹ 2,00,000.  since, the rate of return of the firm, r, is 10% and it is more than the $K_e$ of 8%, therefore, by distributing 75% of earnings, the firm is not following an optimal dividend policy.  The optimal dividend policy for the firm would be to pay zero dividend and in such a situation, the market price would be

$$\frac{0 + \dfrac{0.1}{0.08}(10 - 0)}{0.08} = ₹\ 156.25$$

So, theoretically the market price of the share can be increased by adopting a zero payout.

**(ii)** The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the $K_e$ would be equal to the rate of return, r, of the firm.  The $K_e$ would be 10% (= r) at the P/E ratio of 10.  Therefore, at the P/E ratio of 10, the dividend policy would have no effect on the value of the share.

**(iii)** If the P/E is 8 instead of 12.5, then the $K_e$ which is the inverse of P/E ratio, would be 12.5 and in such a situation $k_e > r$ and the market price, as per Walter's model would be:

$$P = \frac{D + \dfrac{r}{K_e}(E-D)}{K_e} = \frac{7.5 + \dfrac{0.1}{0.125}(10 - 7.5)}{0.125} = ₹\ 76$$

3. Market price per share by

  (i) **Walter's model:**

$$P = \frac{D + \frac{r}{K_e}(E - D)}{K_e}$$

$$= \frac{6 + \frac{0.25}{0.20}(10 - 6)}{0.20} = ₹\,55$$

  (ii) **Gordon's model (Dividend Growth model):** When the growth is incorporated in earnings and dividend, the present value of market price per share ($P_o$) is determined as follows

Gordon's theory:

Present market price per share ($P_o$) $= \dfrac{E(1-b)}{k - br}$

Where,

$P_o$ = Present market price per share.

E = Earnings per share

b = Retention ratio (i.e. % of earnings retained)

r = Internal rate of return (IRR)

**Hint:**

Growth rate (g) = br

$$P_o = \frac{10\,(1-0.40)}{0.20 - (0.4 \times 0.25)}$$

$$= ₹\,\frac{6}{0.1}$$

$$= ₹60$$

4. The P/E ratio i.e. price earnings ratio can be computed with the help of the following formula:

P/E ratio $= \dfrac{MPS}{EPS}$

Since the D/P ratio is 40%,

D = 40% of E i.e. 0.4E

Hence,

Market price per share (P) using Graham & Dodd's model =

$$P_0 = m\left(D + \frac{E}{3}\right)$$

Where,

$P_0$ = Market price per share

D = Dividend per share

E = Earnings per share

m = a multiplier

$$P_0 = 9\left(0.4E + \frac{E}{3}\right)$$

$$P_0 = 9\left(\frac{1.2E + E}{3}\right) = 3\,(2.2E)$$

$$P_0 = 6.6E$$

$$\frac{P}{E} = 6.6 \text{ i.e. P/E ratio is 6.6 times}$$