4

Dividend Decisions

Learning Objectives

After going through this chapter student shall be able to understand:

- Basic introduction of Dividend Policy

- Practical considerations in Dividend Policy

- Theories on Dividend Policies

    (1) Traditional Position

    (2) Walter Approach

    (3) Gordon Growth Model

    (4) Modigilani and Miller (MM) Hypothesis

    (5) Lintner's Model

    (6) Radical Approach

    (7) Dividend Discount Model

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1. Introduction

The term 'dividend' refers to that portion of profit (after tax) which is distributed among the owners/shareholders of the firm and the profit which is not distributed is known as retained earnings. Dividend decisions are an important aspect of corporate financial policy since they can have an effect on the availability as well as the cost of capital. It is a decision made by the Board of Directors of a company and approved by the shareholders at the general meeting. Shareholders do not have the right to ask for divided nor increase in the rate of dividend as the Board has the unfettered right. However, this power cannot be used arbitrarily or advantageously by the Board and therefore the Board has to evolve a dividend policy that maximize shareholders' wealth. Since dividend decision relates to the amount and timing of any cash payments made to the company's stakeholders, the decision is an important one for the firm as it may influence its capital structure and stock price. In addition, the decision may determine the amount of taxation that shareholders have to pay.

2. Dividend Policy

Firm's dividend policy divides net earnings into retained earnings and dividends. Retained earnings provide necessary funds to finance long term growth while dividends are paid in cash generally. Dividend policy of the firm is governed by:

(i) **Long Term Financing Decision**: When dividend decision is treated as a financing decision, net earnings are viewed as a source of long term financing. When the firm does not have profitable investment opportunities, dividend will be paid. The firm grows at a faster rate when it accepts highly profitable opportunities. External equity is raised to finance investments. But retained earnings are preferable because they do not involve floatation costs. Payment of cash dividend reduces the amount of funds necessary to finance profitable investment opportunities thereby restricting it to find other avenues of finance. Thus earnings may be retained as part of long term financing decision while dividends paid are distribution of earnings that cannot be profitably re-invested.

(ii) **Wealth Maximisation Decision:** 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. 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.

3.   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. 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 debt through issue of new share capital where floatation costs are involved. Mature companies having few investment opportunities will show high payout ratios; share prices of such companies are sensitive to dividend charges. So a small portion of the earnings are kept to meet emergent and occasional financial needs. Growth companies, on the other hand, have low payout ratios. They are in need of funds to finance fast growing fixed assets. 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. These companies increase the amount of dividends gradually as the profitable investment opportunities start falling.

(b)   Constraints on Paying Dividends

(i)   *Legal:* Under Section 205(1) of the Companies Act 1956, dividend is to be paid out of current profits or past profits after depreciation. The Central Government can allow a company to pay dividend for any financial year out of profits of the company without providing for depreciation if it is in the public interest. Dividend is to be paid in cash but a company is allowed to capitalise profits or reserves (retained earnings) for issuing fully paid bonus shares. Capital profit may also be distributed as dividends if articles permit.

(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 areutilised 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 corporate as (Dividend Distribution Tax) and shareholders need not pay any tax on income received by way of dividend from domestic companies. To the extent small shareholders who are concerned with regular dividend income or who do not form a dominant group or retired and old people investing their savings, pension to purchase shares may prefer regular income and 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. For such of those who prefer to gain on sale of shares, as per the provisions of the Income Tax Act, 1961, tax on capital gains (short-term @ 15%) are attracted if they sell the shares on holding less than one year and there is no tax on long-term sale (if held for more than one year). However, shareholders have to pay Securities Transaction Tax (STT) on sale of shares.

The dividend policy, thus pursued by the company should strike a balance on the desires of the shareholders who may belong either of the group as explained above. 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: Regular payment of dividend annually even if the amount of dividend may fluctuate year to year may not be, related with earnings.

(i)   *Constant Dividend per Share*: Irrespective of the fluctuation in earnings, companies may follow the policy of paying a fixed amount per share as dividend every year. If the company reaches new level of earnings and expects to maintain it, the annual dividend per share may be increased.

Fig. 1 Constant Dividend per share policy
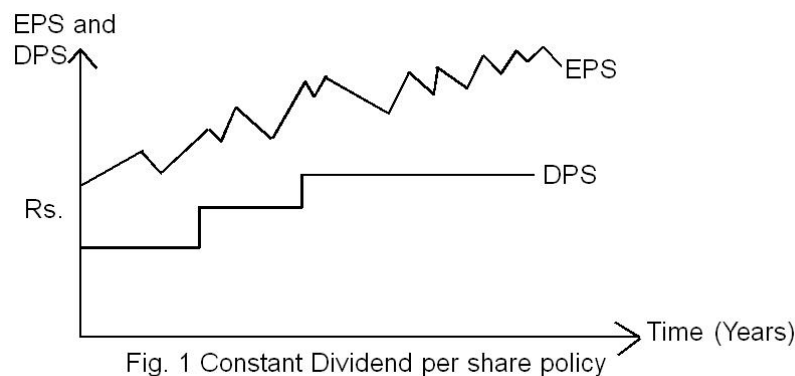
With wide fluctuation in the pattern of earnings, it is necessary to build up surplus in years of higher than average earnings to maintain dividends in years of below average income. This gives rise to the creation of Dividend Equalisation Reserve Fund earmarked by marketable securities for easy conversion to cash at the time of 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 pay out ratio. Some companies follow a policy of constant pay out 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 distributeupto30% of the Consolidated Profit after Tax (PAT) of the Infosys Group as Dividend."

Contrast this to what Warren Buffet got to say about declaring a payout ratio. He 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.
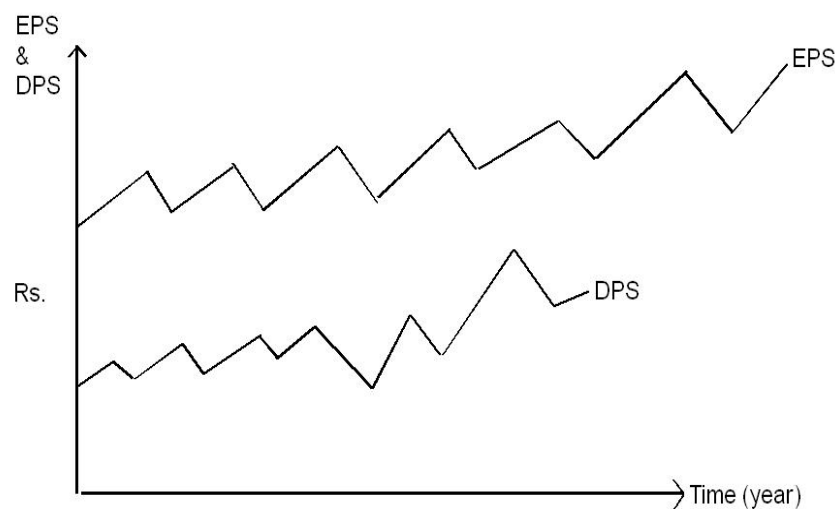

Fig. 2 Dividend policy at Constant Payout ratio

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.

(e) **Form of Dividend:** Dividends can be divided into following forms:

(i) *Cash dividend*: The company should have sufficient cash in bank account when cash dividends are declared. If it does not have enough bank balance, it should borrow funds. For stable dividend policy a cash budget may be prepared for coming period to indicate necessary funds to meet regular dividend payments.

The cash account and reserve account of the company will be reduced when cash dividend is paid. Both total assets and net worth of the company are reduced when cash dividend is distributed. According to Hastings, market price of share drops by the amount of cash dividend distributed.

(ii) Stock Dividend (Bonus shares): It is distribution of shares in lieu of cash dividend to existing shareholders. 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: 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.

   (b) Policy of paying fixed dividend per share and its continuation even after declaration of stock dividend will increase total cash dividend of the share holders 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: Some of the limitations are:

(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.

4.   Theories on Dividend Policies

The important theories on dividend policies are discussed as follows:

4.1 Traditional Position

According to the traditional position expounded by Graham and Dodd, the stock market places considerably more weight on dividends than on retained earnings. For them, the stock market is overwhelmingly in favour of liberal dividends as against niggardly dividends. Their view is expressed quantitatively in the following valuation model:

$$P = m (D + E/3)$$

Where,

P = Market Price per share

D = Dividend per share

E = Earnings per share

m = a Multiplier.

As per this model, in the valuation of shares the weight attached to dividends is equal to four times the weight attached to retained earnings. In the model prescribed, E is replaced by (D+R) so that

$$P = m \{D + (D+R)/3\}$$
$$= m (4D/3) + m (R/3)$$

The weights provided by Graham and Dodd are based on their subjective judgments and not derived from objective empirical analysis. Notwithstanding the subjectivity of these weights, the major contention of the traditional position is that a liberal payout policy has a favourable impact on stock prices.

4.2 Walter Approach

The formula given by Prof. James E. Walter shows how dividend can be used to maximise the wealth position 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. The formula is simple to understand and easy to compute. 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. However, the formula does not consider all the factors affecting dividend policy and share prices. Moreover, determination of market capitalisation rate is difficult. Further, the formula ignores such factors as taxation, various legal and contractual obligations, management policy and attitude towards dividend policy and so on.

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

$$V_c = \frac{D + \frac{R_a}{R_c}(E - D)}{R_c}$$

Where,

    V_c = Market value of the ordinary shares of the company

    R_a = Return on internal retention, i.e., the rate company earns on retainedprofits

    R_c= Cost of Capital

    E = Earnings per share

    D = Dividend per share.

A close study of the formula indicates that Professor Walter emphasises two factors which influence the market price of a share. The first is the dividend per share and the second is the relationship between internal return on retained earnings and the market expectation from that company as reflected in the capitalisation rate. In other words, if the internal return of retained earnings is higher than market capitalisation 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.

The formula given by Prof. Walter explains why market prices of shares of growth 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.

Illustration 1

XYZ Company which earns ₹ 10 per share is capitalized at 10 percent and has a return on investment of 12 percent. Determine the optimum dividend payout ratio and the price of the share at the payout using Walter's dividend policy model.

Solution

According to Walter's approach, the optimum dividend payout ratio would be zero as R_a >$R_c$because the value of the share of the firm would be maximum.

$$V_c = \frac{D + \dfrac{R_a}{R_c}(E-D)}{R_c} = \frac{(0.12/0.10)(₹\,10)}{0.10} = ₹\,120$$

Illustration 2

T*he 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%*

What should be the approximate dividend pay-out ratio so as to keep the share price at ₹ 42 by using Walter model?

Solution

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

Cost of capital i.e. (k_e)

(Assumed)   16%

Let, the dividend pay-out ratio be X and so the share price will be:

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

Here D = 6x; E = ₹ 6; r = 0.20 and K_e = 0.16 and P = ₹ 42

$$\text{Hence } ₹\ 42 = \frac{6x}{0.16} + \frac{0.2\,(6 - 6x)}{0.16 \times 0.16}$$

or ₹ 42 = 37.50X + 46.875 (1 −x)

$\qquad$ = 9.375x = 4.875

$\qquad$ x = 0.52

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

Illustration 3

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%*

(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

<u>M/s XY Ltd</u>.

(i)   Walter's model is given by

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

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%

$$P \quad = \frac{3 + (5-3) \times \dfrac{0.15}{0.12}}{0.12} = \frac{3 + 2.0 \times \dfrac{.15}{.12}}{0.12} = ₹ \ 45.83$$

(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:

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

Illustration 4

From the following particulars given in the table calculate the market share price (for growth, normal and declining firms) using Walter's approach to dividend model. Also calculate the share price, assuming the DPS is ₹ 3.

Factors	$R > R_c$	$R = R_c$	$R < R_c$
R_a (rate of return on retained earnings)	25%	20%	15%
R_c (cost of capital)	20%	20%	20%
E (Earning per share)	₹ 5	₹ 5	₹ 5
D(Dividend per share)	₹ 5	₹ 5	₹ 5

Solution

By applying the Walter's formula the share price for the three categories of firms is ₹ 25

$$V_c = \frac{D + \frac{R_a}{R_c}(E-D)}{R_c} = \frac{5 + \frac{25}{20}(5-5)}{20} = ₹\ 25$$

If it is assumed that DPS is ₹ 3 then the value of the share for different firms will be as follows:

a)   For Growth firm = ₹ 27.50

b)   For Normal firm = ₹ 25

c)   For Declining firm = ₹ 22.50

From the above it follows that

a)   When the rate of return is greater than the cost of capital R>R$_c$, the price per share increase as the D/P decrease. The optimum pay out ratio for the growth firm will be Nil.

b)   When the rate of return is equal to the cost of capital is R=R$_c$, then the price per share does not vary with the changes in D/P ratio. The optimum payout ratio for the normal firm is irrelevant.

c)   When the rate of return is less than the cost of capital i.e. R<R$_c$ the price per share increases as the D/P ratio increases. The optimum payout ratio for the declining firm is 100%.

Illustration 5

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/Earning ratio	12.5

Applying Walter's Model

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

(ii)   *Find out what should be the 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?*

Solution

(i)   The EPS of the firm is ₹ 10 (i.e., ₹ 2,00,000/20,000). 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:

$$P = \frac{D}{K_e} + \frac{(r/K_e)(E-D)}{K_e} = \frac{7.50}{.08} + \frac{(.10/.08)(10-7.5)}{.08} = ₹ \ 132.81$$

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

$$P = \frac{D}{k_e} + \frac{(r/K_e)(E-D)}{K_e} = \frac{0}{.08} + \frac{(.10/.08)(10-0)}{.08} = ₹ \ 156.25$$

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 ke 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

$$P = \frac{D}{K_e} + \frac{(r/K_e)(E-D)}{K_e} = \frac{7.50}{.125} + \frac{(.1/.125)(10-7.5)}{.125} = ₹ \ 76$$

4.3 Gordon Growth Model

Another theory which contends that dividends are relevant is the Gordons' model. This model explicitly relates the market value of the firm to dividend policy. In this model, the current ex-dividend at the amount which shareholders expected date of return exceeds the constant growth rate of dividends. It is based on the following assumptions:

*   The firm is an all equity firm, and it has no debt.

*   No external financing is used and investment programmes are financed exclusively by retained earnings.

*   The internal rate of return, r, of the firm is constant.

*   The appropriate discount rate, k_e, for the firm remains constant.

*   The firm has perpetual life.

*   The retention ratio, b, once decided upon, is constant. Thus, the growth rate, g = br, is also constant.

*   The discount rate is greater than the growth rate, k_e> br.

Myron 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:

$$V_E = \left[\frac{d_o\ (1+g)}{k_e - g} \right]$$

Where,

V_E = 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 is greater than the discount rate, the price per share increases as the dividend ratio decreases and if the return is less than discount rate it is vice-versa. The price per share remains unchanged where the rate of return and discount rate are equal.

Illustration 6

Starlite Limited is having its shares quoted in major stock exchanges. Its share current market price after dividend distributed at the rate of 20% per annum having a paid-up shares capital of ₹ 10 lakhs of ₹ 10 each. Annual growth rate in dividend expected is 2%. The expected rate of return on its equity capital is 15%.

Calculate the value of Starlite Limited's share based on Gordons' model.

Solution

Dividend distributed during the year $= 10,00,000 \times \dfrac{20}{100}$

$= ₹\ 2,00,000$

$$V_E = \left[\frac{d_O\ (1+g)}{k_e - g} \right]$$

$$= \frac{₹\ 2,00,000\,(1+0.02)}{0.15 - 0.02} = \frac{₹\ 2,00,000\,(1.02)}{0.13}$$

$= ₹\ 15,69,230.77$

Value per share $= \left[\dfrac{₹\ 15,69,230.77}{1,00,000} \right] = ₹\ 15.69$

Illustration 7

Again taking an example of three different firms i.e. growth, normal and declining firm, the Gordon model can be applied with the help of a following example:

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

Solution

By applying the formulae as given under Gordon's model, the share price is equal to ₹ 400. Similarly, the share price for the normal growth and declining firm will be ₹ 100 and ₹ 77 respectively.

Further, if the value of b is changed from 0.4 to 0.6, the new share price will be as follows:

Growth Firm ₹ 150

Normal Firm ₹ 100

Declining Firm ₹ 88

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 are similar to that of Walter's model.

4.4 Modigliani and Miller (MM) Hypothesis

Modigliani and Miller Hypothesis is in support of the irrelevance of dividends. Modigiliani and Miller argue that firm's dividend policy has no effect on its value of assets and is, therefore of no consequence i.e. dividends are irrelevant to shareholders wealth. According to them, *'Under conditions of perfect capital markets, rational investors, absence of tax discrimination between dividend income and capital appreciation, given the firm's investment policy, its dividend policy may have no influence on the market price of shares'.*

The hypothesis is based on the following assumptions:

- The firm operates in perfect capital markets in which all investors are rational and information is freely available to all.

- There are no taxes. Alternatively, there are no differences in the tax rates applicable to capital gains and dividends.

- The firm has a fixed investment policy.

- There are no floatation or transaction costs.

- Risk of uncertainty does not exist. Investors are able to forecast future prices and dividends with certainty, and one discount rate is appropriate for all securities and all time periods. Thus, $r = k = k_t$ for all t.

MM Hypothesis is primarily based on the arbitrage argument. Through the arbitrage process, the MM Hypothesis discusses how the value of the firm remains same whether the firm pays dividend or not. It argues that the value depends on the earnings of the firm and is unaffected by the pattern of income distribution. Suppose, a firm which pays dividends will have to raise funds externally to finance its investment plans, MM's argument, that dividend policy does not affect the wealth of the shareholders, implies that when the firm pays dividends, its advantage is offset by external financing. This means that the terminal value of the share declines when dividends are paid. Thus, the wealth of the shareholders - dividends plus terminal price - remains unchanged. As a result, the present value per share after dividends and external financing is equal to the present value per share before the payments of dividends. Thus, the shareholders are indifferent between payment of dividends and retention of earnings.

Market price of a share after dividend declared on the basis of MM model is shown below:

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

Where,

P_0 = The prevailing market price of a share

K_e = The cost of equity capital

D_1 = Dividend to be received at the end of period one

P_1 = Market price of a share at the end of period one.

If the firm were to finance all investment proposals, the total amount raised through new shares will be ascertained with the help of the following formula:

$$\Delta N = \frac{I - (E - nD_1)}{P_1}$$

Where,

ΔN = Change in the number of shares outstanding during the period

n = Number of shares outstanding at the beginning of the period

I = Total investment amount required for capital budget

E = Earnings of net income of the firm during the period.

The theory of 'Home-Made dividends' further supports the MM argument.

Let us assume that Mrs. X holds 80 shares in a company whose share price after it declared a dividend of ₹ 2 per share is ₹ 42. You would expect the ex-dividend price to become ₹ 40 after the record date. Mrs. X does not like ₹ 2 per share – she had expected ₹ 3 per share and, therefore, she resorts to 'home made dividends'

What is this 'home made dividends'?

Mrs. X's current wealth is ₹ 42 x 80 = ₹ 3,360

Mrs. X's post dividend wealth would be ₹ 40 x 80 + ₹ 160 = ₹ 3,360 (i.e. market price + dividend on hand), if she is happy with the ₹ 2 per share dividend.

She can derive the same value by selling 2 shares at ex-dividend price of ₹ 40 x 2 = ₹ 80. Her wealth now is ₹ 40 x 78 + ₹ 160 + ₹ 80 = ₹ 3,360

If the company, in deference to the wishes of Mrs. X had declared ₹ 3 per share as dividend, her post dividend wealth would be ₹ 39x78 + ₹ 240 = ₹ 3,360

In all cases above, the wealth of the shareholder never changed, in spite of the fact that the amount of dividend varies.

Hence, any shareholder can always resort to 'home made dividends' to realise his returns from the investment. The amount of dividend declared by the Board is irrelevant to his/her wealth.

A discerning student of finance should be able to understand the application of 'home made dividends' and the irrelevance of dividends in the following news story of Jan 16th 2003:

Microsoft Corp. yesterday acted to quiet shareholders clamoring for some of the company's $43.4 billion cash surplus, promising to issue its first-ever dividend this year.

The world's largest software maker also announced a 2-for-1 stock split and said its second fiscal quarter yielded record revenue and profits just shy of expectations. Still, shares declined in after-hours trading on the company's lowered sales forecast for the remainder of the year.

The stock had already closed at $55.35, down 92 cents for the day. After the announcement, it fell $1.71 more, or 3 percent, in after-hours sessions.

The dividend declaration comes on the heels of President Bush's Jan. 7 tax-reform plan, which would exempt shareholders from income tax on dividends from tax-paying corporations. But Microsoft said the two developments aren't connected. Microsoft's declaring a dividend "makes enough sense," said Michael Holland, manager of the Holland Balanced Fund, which invests $52 million and has Microsoft as its biggest holding.Now Microsoft's cash "can be delivered to shareholders, including (Microsoft Chairman) Bill Gates," he said…

Read more: http://www.seattlepi.com/business/article/Microsoft-surprises-will-issue-first-ever-1105495.php#ixzz20m3ZMENA

Clearly the reason for share price reduction is about business prospects and not about a voluminous maiden dividend for a company that never declared a dividend, since it listed in 1986.

Merton Miller view: Does declaration of dividend/higher dividend influence shareholder wealth? Restated, "should markets price shares of companies that pay 'generous dividends', at a premium?

Perhaps, this question will never be answered by Corporate Finance theory to the satisfaction of every on-looker, especially the practitioners

Merton Miller answers this question using the analogy of "bent stick in the water". Looking from outside, the stick is bent inside the water. Our eyes deceive us because we know that the stick is fine! Miller's point is that a corporate's value is driven by its investment policy and not by its financing policy. The investment policy of the firm is set ahead of time and is not altered by changes in dividend policy. Dividend is merely putting some money in the pockets of the shareholder while taking it out from the other pocket. To quote him:

"Dividend Policy may not be an effective management tool and may not even be completely under your control in a world of rational expectations; but there are things that do matter and over which you do have more control. I refer, of course, to the firm's investment decisions and to the engineering, production, personnel, marketing and research decisions that underlie them. These decisions are in what economists call the "real" side of the business and they generate the firm's current and future cash flows. And that you will find is what really matters".

Illustration 8

P.L. Engineering Ltd. belongs to a risk class for which the capitalisation rate is 10 per cent. It currently has outstanding 10,000 shares selling at ₹ 100 each. The firm is contemplating the declaration of a dividend of ₹ 5 per 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. Show how under M - M Hypothesis, the payment of dividend does not affect the value of the firm.

Solution

(a)   Value of the firm when dividends are not paid:

    (i)   Price per share at the end of the year 1.

$$₹\ 100\ =\ \frac{P_1}{1.10}$$

       $\therefore P_1 = 110$

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

       $\Delta n\ P_1 = (₹\ 2,00,000 - ₹\ 1,00,000)$

       $= ₹\ 1,00,000$

    (iii)   Number of additional shares to be issued.

$$\frac{₹\ 1,00,000}{₹\ 110}\ =\ \frac{10,000}{11}\ \text{shares}$$

(iv) Value of the firm

$$= \frac{\left[\dfrac{10,000}{1} + \dfrac{10,000}{11}\right]110 - 2,00,000 + 1,00,000}{1.10}$$

$$= \frac{10,99,999}{1.10} = 9,99,999 = ₹\ 10,00,000$$

(b)   Value of the firm, when dividends are paid:

(i)   Price per share at the end of year 1

$$= \frac{1}{\left(1 + K_e\right)}(D_1 + P_1)$$

$$₹\ 100 = \frac{1}{1.10}(₹\ 5 + P_1)$$

$$110 = 5 + P_1$$

$$P_1 = 105$$

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

$$\Delta n\ P_1 = I - (E - n\ D_1)$$

$$= ₹\ 2,00,000 - (₹\ 1,00,000 - 10,000 \times 5) = ₹\ 1,50,000$$

(iii) Number of additional shares to be issued.

$$\Delta n = \frac{₹\ 1,50,000}{₹\ 105} = \frac{10,000}{7}\ \text{shares}$$

(iv) Value of the firm

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

$$= \frac{\left[\dfrac{10,000}{1} + \dfrac{10,000}{7}\right]105 - 2,00,000 + 1,00,000}{1.10}$$

$$= \frac{10,99,999}{1.10} = 9,99,999 = ₹\ 10,00,000$$

Thus, it can be seen that the value of the firm remains the same whether dividends are paid or not. Further, the illustration clearly demonstrates that the shareholders are indifferent between the retention of profits and the payment of dividend.

Illustration 9

ABC Ltd. has a capital of ₹ 10 lakhs in equity shares of ₹ 100 each. The shares are currently quoted at par. The company proposes declaration of a dividend of ₹ 10 per share at the end of the current financial year. The capitalisation rate for the risk class to which the company belongs is 12%.

What will be the 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 lakhs during the period, how many new shares must be issued? Use the M.M. model.

Solution

Under M.M. Model, the following formula is used to ascertain the market price of Equity Shares:

$$P_0 = \frac{1}{1+Ke} \times (D1 + P1)$$

P_0 = Prevailing market price of a share i.e., ₹ 100 in this case. (quoted at Par)

P1   = Market Price of a share at the end of period one.

D1   = Dividend to be received at the end of period one.

Ke   = Cost of Equity Capital.

(i)   If the dividend is not declared

$$100 = \frac{1}{1+0.12} \times P1$$

P1 = 100 × 1.12 = ₹ 112

The market price of the Equity share at the end of the year would be ₹ 112.

(ii)   If the dividend is declared

$$100 = \frac{1}{1+0.12} \times (10+P1)$$

$$100 = \frac{10+P1}{1.12}$$

112 = 10 + P1

P1 = 112 - 10 = ₹ 102

The market price of the equity share at the end of the year would be ₹ 102.

(iii) Price of the Equity share would be ₹ 102, if the dividend is paid.

Hence Number of shares to be issued:

np1 = I – (NP – nD1)

Where n = No. of New shares to be issued

NP = Net Profit

nD1 = Total dividend paid (see note 1)

I = Investment

n 102 = 10,00,000 – (5,00,000 – 1,00,000)

n 102 = 6,00,000

$n = \dfrac{6,00,000}{102}$ = 5,883 shares to be issued

Note: No. of Equity shares existing = $\dfrac{10,00,000}{100}$ = 10,000 shares

Dividend paid 10,000 × 10 per share = ₹ 1,00,000

Illustration 10

The following is the data regarding two Companies 'X', and 'Y' belonging to the same equivalent risk class:

	Company X	Company Y
Number of ordinary shares	*90,000*	*1,50,000*
Market price per share	*₹ 1.20*	*Re. 1.00*
6% Debentures	*60,000*	*–*
Profit before interest	*₹ 18,000*	*₹ 18,000*

All profits after debenture interest are distributed as dividends.

You are required to:

(a)   *Explain how under Modigliani & Miller approach, an investor holding 10% of shares in Company 'X' will be better off in switching his holding to Company 'Y'.*

(b)   *List the assumptions implicit in your answer to 'a' above.*

Solution

Working Notes:

	Company X	Company Y
Profit before interest	18,000	18,000
Less: Interest	3,600	–
Net Profit	14,400	18,000
All profits after debenture interest are Distributed as dividends.		
Dividend per share	14,400	18,000
	90,000	1,50,000
	= ₹ 0.16	= ₹ 0.12

(a) Present income of the investor holding 10% of shares in company X:

10% of shares = 9,000 shares × 0.16 = ₹ 1,440 dividend.

He will dispose of in the market and get ₹ 10,800 (i.e. 9,000 × 1.20).

The same amount of ₹ 10,800 will be invested in Company Y. 10,800 shares will be purchased at Re. 1.00 per share. Then he will get dividend of ₹ 1,296 (10,800 × 0.12). Hence, he will not be better off in switching his holding to company Y.

(b) Assumptions of Modigliani & Miller approach:

• Existence of perfect capital market, where all investors are rational.

• No tax differential between dividend income and capital gain.

• Transaction and floatation costs do not exist.

• Risk of uncertainty does not exist.

• The firm has a fixed investment policy.

• Free and uniform access to relevant information of capital market.

• No investor can sway the market forces.

• The cost of equity is equal to shareholders' expectations.

• Securities are infinitely divisible.

• Organisation has a fixed investment policy.

Alternative to (a) above:

M & M approach by applying arbitrage process:

Particulars	= Market value of Firms	
	X	Y
(i) Market value of Equity shares	1,08,000	1,50,000
	(90,000 × 1.20)	(1,50,000 × 1.00)
(ii) Market value of Debentures	60,000	–
Value of Firm	1,68,000	1,50,000

According to MM's approach, the marginal investor would switch from overvalued to undervalued firm by selling his holdings in the firm X (levered one and overvalued one) and would buy the same percentage of shares of the firm Y. The arbitrage process will work out as follows:

Investor will dispose 10% of shares in Company X and realise

9,000 shares at ₹ 1.20 each =   10,800

Add: He will borrow 10% of

60,000 debt at 6% interest   6,000

Total amount   16,800

With this amount, the investor will buy 16,800 shares in Company Y at ₹ 1.00 each. Then compare the resultant income as follows:

Present income in X (as worked out above) = 1,440

Proposed income in Y:

1,50,000 shares   PBT 18,000

16,800 shares ?

$$\frac{16,800}{1,50,000} \times 18,000 \qquad = ₹\ 2016$$

Less: Interest on debt 6,000 × 6% $= ₹\ 360$

Net Income   ₹ 1656

This shows that the investor will be better off in switching his holdings to Company Y.

Notes:

(i)   When the investor sells equity in Company X and buys equity in company Y with personal leverage, the market value of equity of Company X tends to decline and the market value of equity of company Y tends to rise. This process will continue till the market values of both the companies are in equilibrium.

(ii)   The borrowings of ₹ 6,000 has to be taken on the same terms and conditions as corporate borrowing. Hence, 6% interest rate has been adopted.

(iii) Companies should belong to the same equivalent risk class.

(iv)   Taxes do not exist and hence tax has not been taken into account.

Illustration 11

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)*
       Earning per share (EPS)   *₹ 10*
       Dividend per share (DPS)   *₹ 6*
       Cost of capital (k)   *20%*
       Internal rate of return on investment   *25%*
       Retention Ratio   *60%*

Solution

Market price per share by

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

$$V_c = \frac{D + \dfrac{R_a}{R_c}(E - D)}{R_c}$$

$$P = \frac{6 + \frac{.25}{.20}(10 - 6)}{.20}$$

P = ₹ 55

(ii) Gordon's formula (Dividend Growth model): When the growth is incorporated in earnings and dividend, the present value of market price per share (P_0) is determined as follows

Gordon's theory:

$$P_0 = \frac{E(1-b)}{k-br}$$

Where,

P_0 = Present market price per share.

E = Earning per share

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

r = Internal rate of return (IRR)

Hint:

Growth rate (g) = br

$$P_0 = \frac{10(1-.60)}{.20-(.60 \times .25)} = ₹ \frac{4}{.05} = ₹ 80$$

Illustration 12

Following are the details regarding three companies X Ltd., Y Ltd. and Z Ltd.

	X Ltd.	*Y Ltd.*	*Z Ltd.*
Internal Rate of return (%)	*5*	*20*	*15*
Cost of equity capital (%)	*15*	*15*	*15*
Earning per share	*₹ 10*	*₹ 10*	*₹ 10*

Calculate the value of an equity share of each of those companies applying Walter's formula when dividend payment ratio (DIP) ratio is (a) 75% (b) 50% (c) 80%.

Solution

Value of an equity share according to Walter's formula is:

$$V_c = \frac{D + \frac{R_a}{R_C}(E-D)}{R_C}$$

Where,

V_c = Market value of the ordinary share of the company.

R_a = Return on internal retention i.e. the rate company earns in retained profits.

R_c = Capitalisation rate i.e. the rate expected by investors by way of return from particular category of shares.

E = Earnings per share

D = Dividend per share

(i)   Market Price per share when D/P ratio is 75%.

X Ltd.	Y Ltd.	Z Ltd.
$\dfrac{7.5 + \dfrac{.05}{.15}(10 - 7.5)}{.15}$	$\dfrac{7.5 + \dfrac{.20}{.15}(10 - 7.5)}{.15}$	$\dfrac{7.5 + \dfrac{.15}{.15}(10 - 7.5)}{.15}$
= ₹ 56	= ₹ 72	= ₹ 67

(ii)   When D/P ratio is 50%

$\dfrac{5 + \dfrac{.05}{.15}(10 - 5)}{.15}$	$\dfrac{5 + \dfrac{.20}{.15}(10 - 5)}{.15}$	$\dfrac{5 + \dfrac{.15}{.15}(10 - 5)}{.15}$
= ₹ 44	= ₹ 78	= ₹ 67

(iii)   When D/P ratio is 80%

$\dfrac{8 + \dfrac{.05}{.15}(10 - 8)}{.15}$	$\dfrac{8 + \dfrac{.20}{.15}(10 - 8)}{.15}$	$\dfrac{8 + \dfrac{.15}{.15}(10 - 8)}{.15}$
= ₹ 58	= ₹ 71	= ₹ 67

Conclusions:

X Ltd.: This company may be considered as declining firm because IRR is lower than the cost of capital. It will therefore, be appropriate for this company to distribute the earnings among its shareholders.

Y Ltd.: This company may be considered as going firm because IRR is higher than the cost of capital. It will therefore, be appropriate for this company to retain the earnings.

Z Ltd.: This company may be considered as normal firm because IRR is equal to the cost of capital. D/P has no impact on value per share.

4.5 Lintner's Model

The classic study of the actual dividend behavior was done by John Lintner in 1956. The study was conducted in two stages. First, he conducted a series of interviews with businessmen to form a view of how they went about their dividends decisions. He then formed a model on the basis of those interviews which could be tested on a larger data. His formula is

D_1 = D_0 + [(EPS X Target Payout) – D_0] X A_F

Where

    D_1 = Dividend in year 1

    D_0 = Dividend in year 0

    EPS = Earning Per Share

    A_F = Adjustment Factor

Lintner model has two parameters:

(1) The target pay-out ratio and

(2) The spread at which current dividends adjust to the target.

From the interviews he conducted, it emerged that investment needs were not a major consideration in the determination of dividend policy, rather the decision to change the dividend was usually a response to a significant change in earnings which had disturbed the existing relationship between earnings and dividends. Lintner concluded that

(1) Companies tend to set long run target dividends-to-earning ratios according to the amount of positive net present value (NPV) project that are available.

(2) Earning increases are not always sustainable. As a result, dividend policy is not changed until managers can see that new earnings level are sustainable.

4.6 Radical Approach

This approach takes into consideration the tax aspects on dividend i.e. the corporate tax and the personal tax. Also it considers the fact that tax on dividend and capital gains are taxed as different rate. The approach is based on one premise that if tax on dividend is higher than tax on capital gains, the share of the company will be attractive if the company is offering capital gain. Similarly, if tax on dividend is less than the tax on capital gains, i.e. company offering dividend rather than capital gains, will be priced better.

4.7 Dividend Discount Model

It is a financial model that values shares at the discounted value of the future dividend payments. The model provides a means of developing an explicit expected return for the market. Since shares are valued on the actual cash flows received by the investors, it is theoretically the correct valuation model. Under this model, the price a share will be traded is calculated by the net present value of all expected future divided payment discounted by an appropriate risk-adjusted rate. This dividend discount model price is the intrinsic value of the stock. If the stock pays no dividend, then the expected future cash flows is the sale price of the stock. The security with a greater risk must potentially pay a greater rate of return to induce investors to buy the security. The required rate of return (capitalization rate) is the rate of return required by investors to compensate them for the risk of owning the security. This capitalization rate can be used to price a stock as the sum of its present values of its future cash flows in the same way that interest rates are used to price bonds in terms of its cash flows. The price of a bond is the sum of the present value of its future interest payments

discounted by the market rate. Similarly, the dividend discount model (DDM, dividend valuation model, DVM) prices a stock by the sum of its future cash flows discounted by the required rate of return that an investor demands for the risk of owning the stock. Future cash flows include dividends and the sale price of the stock when it is sold. This DDM price is the intrinsic value of the stock. If the stock pays no dividend, then the expected future cash flow is the sale price of the stock.

Intrinsic Value = Sum of Present Value of Future Cash Flows

Intrinsic Value = Sum of Present Value of Dividends + Present Value of Stock Sale Price

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

P = Selling Price of Stock

D = Annual Dividend Payment

k = Capitalization Rate

n = Number of Years until Stock is Sold;

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. This is done so that the capitalization rate (k) is an annual rate, since most rates of return are presented as annual rates. If the stock is never sold, then it is essentially perpetuity, and its price is equal to the sum of the present value of its dividends. Since the DDM considers the current sale price of the stock to be equal to its future cash flows, then it must also be true that the future sale price of the stock is equal to the sum of the cash flows subsequent to the sale discounted by the capitalization rate. In an efficient market, the market price of a stock is considered to be equal to the intrinsic value of the stock, where the capitalization rate is equal to the market capitalization rate, the average capitalization rate of all market participants.

There are 3 models used in the dividend discount model:

a. **Zero-growth,** which assumes that all dividends paid by a stock remain the same.

b. **Constant-growth** model, which assumes that dividends grow by a specific percent annually.

c. **Variable-growth model**, which typically divides growth into 3 phases: a fast initial phase, then a slower transition phase that ultimately ends with a lower rate that is sustainable over a long period.

a. **Zero-Growth Rate DDM:** Since the zero-growth model assumes that the dividend always stays the same, the stock price would be equal to the annual dividends divided by the required rate of return.

Stock's Intrinsic Value = Annual Dividends / Required Rate of Return

This is basically the same formula used to calculate the value of a perpetuity, which is a bond that never matures, and can be used to price preferred stock, which pays a dividend that is a specified percentage of its par value. A stock based on the zero-growth model can still change in price if the capitalization rate changes, as it will if perceived risk changes, for instance, if a share pays dividend of 1.80 per year, and the required rate of return for the stock is 8%, then its intrinsic value is

Intrinsic Value of Stock = 1.80/0.08 = ₹ 22.50.

b.   Constant-Growth Rate DDM (Gordon Growth Model): The constant-growth DDM (Gordon Growth model, because it was popularized by Myron J. Gordon) assumes that dividends grow by a specific percentage each year, and is usually denoted as g, and the capitalization rate is denoted by k.

Constant-Growth Rate DDM Formula

$$\text{Intrinsic Value} = \frac{D_1}{k-g}$$

D_1 = Next Year's Dividend

k = Capitalization Rate

g = Dividend Growth Rate

The constant-growth model is often used to value stocks of mature companies that have increased the dividend steadily over the years. Although the annual increase is not always the same, the constant-growth model can be used to approximate an intrinsic value of the stock using the average of the dividend growth and projecting that average to future dividend increases. If both the capitalization rate and dividend growth rate remains the same every year, then the denominator doesn't change, so the stock's intrinsic value will increase annually by the percentage of the dividend increase. In otherwords, both the stock price and the dividend amount will increase by the constant-growth factor, g.

Illustration 13

Calculating Next Year's Stock Price Using the Constant-Growth DDM

If a stock pays a ₹ 4 dividend this year, and the dividend has been growing 6% annually, then what will be the price of the stock next year, assuming a required rate of return of 12%?

Solution

Next Year's Stock Price = 4 x 1.06 / (12% - 6%) = 4.24 / 0.06 = 70.67

This Year's Stock Price = 4 / 0.06 = ₹ 66.67

Growth Rate of Stock Price = 70.67 / 66.67 = 1.06 = Dividend Growth Rate

Note that both the zero-growth rate and the constant-growth rate dividend discount models both value stocks in terms of the dividends they pay and not on any capital gains in the stock price; the holding period for the stock is irrelevant; therefore the holding period return is equal either to the dividend rate of the zero-growth model or the constant-growth rate.

Discounted Cash Flow Formula

From the constant-growth dividend discount model, we can infer the market capitalization rate, k, or the rate of return demanded by investors.

Expected Return = Dividend Yield + Capital Gains Yield

If a stock is held for 1 year, and is bought and sold for its intrinsic value, then the following discounted cash flow formula calculates the market capitalization rate:

Capitalization Rate (k) = Dividend Yield + Capital Gain Yield

$$= \frac{D_1}{P0} + \frac{P_1 - P0}{P0}$$

$$= \frac{D_1}{P_0} + \frac{P_0(1 + g) - P0}{P_0}$$

$$= \frac{D_1}{P_0} + g$$

k = Capitalization Rate

D_1 = Next Year's Dividend

P_0 = This Year's Stock Price

P_1 = Next Year's Stock Price

g = Dividend Growth Rate

Often, this is how rates are determined for public utilities by the agencies responsible for setting public rates. Public utilities are generally allowed to charge rates that cover their costs plus a fair market return, with the fair market return being the market capitalization rate.

Implied Growth Rate and Return on Equity: The constant-growth rate DDM formula can also be algebraically transformed, by setting the intrinsic value equal to the current stock price, to calculate the implied growth rate, then using the result to calculate the implied return on equity.

Implied Growth Rate Formula

$$\text{Implied Growth Rate (g)} = k - \frac{D_1}{P}$$

D_1 = Next Year's Dividend

k = Capitalization Rate

P = Current Stock Price

Implied Return on Equity Formula

$$\text{Implied Return on Equity} = \frac{\text{Implied Growth Rate}}{\text{Earnings Retention Rate}}$$

Illustration 14

Calculate the Implied Growth Rate and Return on Equity

Current Stock Price = ₹ 65

Next Year's Dividend = ₹4

Capitalization Rate = 12%

Earnings Retention Rate = 50%

Solution

Implied Growth Rate = 0.12 - 4/65 ≈ 5.85%

Implied Return on Equity = 5.85/50 = 11.7%

c.   Variable-Growth Rate DDM: 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.

Conclusion: The dividend discount model is a useful heuristic model that relates the present stock price to the present value of its future cash flows in the same way that a bond is priced in terms of its future cash flows. However, bond pricing is a more exact science, especially if the bond is held to maturity, since its cash flows and the interest rate of those cash flows are known with certainty, unless the bond issuer defaults. The dividend discount model, however, depends on projections about company growth rate and future capitalization rates of the remaining cash flows. For instance, in a bear market, the capitalization rate will be higher than in a bull market—investors will demand a higher required rate of return to compensate them for a perceived greater amount of risk. Getting either the capitalization rate or the growth rate wrong will yield an incorrect intrinsic value for the stock, especially since even small changes in either of these factors will greatly affect the calculated intrinsic value. Furthermore, the greater the length of time considered, the more likely both factors will be wrong. Hence, the true intrinsic value of a stock is unknowable, and, thus, it cannot be determined whether a stock is undervalued or overvalued based on a calculated intrinsic value, since different investors will have different opinion about the company's future.

So while it is obvious that stocks are priced according to the market's expectations of future cash flows from owning the stock, both as to dividends and future stock price, there is no way to ascertain exactly what that true intrinsic value is.

Summary

1. Introduction

The term 'dividend' refers to that portion of profit (after tax) which is distributed among the owners/shareholders of the firm. Dividend decision relates to the amount and timing of any cash payments made to the company's stakeholders. The decision is an important one for the firm as it may influence its capital structure and stock price. In addition, the decision may determine the amount of taxation that shareholders have to pay.

2. Dividend Policy

Dividend policy of the firm is governed by:

(i)   Long Term Financing Decision

(ii) Wealth Maximisation Decision

3. Practical considerations in Dividend Policy

Following practical considerations determine the dividend policy of a company:

(a) Financial Needs of the Company

(b) Constraints on Paying Dividends

    (i)   Legal

    (ii) Liquidity

    (iii) Access to the Capital Market

    (iv) Investment Opportunities

(c) Desire of Shareholders

(d) Stability of Dividends

    (i)   Constant Dividend per Share

    (ii) Constant Percentage of Net Earnings

    (iii) Small *Constant Dividend per Share plus Extra Dividend*

(e) Form of Dividend: Dividends can be divided into following forms

    (i)   Cash dividend

    (ii) Stock Dividend (Bonus shares)

Advantages of stock dividend:

To Shareholders

- Tax benefit –No tax on dividend received.

- Policy of paying fixed dividend per share and its continuation result in increased cash dividend in future.

To the Company

- Conservation of cash for meeting profitable investment opportunities.

- Cash deficiency and restrictions imposed by lenders to pay cash dividend.

Limitations of stock dividend:

To the Shareholders

Stock dividend does not affect the wealth of shareholders and therefore it has no value for them. This is merely capitalization of profits.

To the Company

Stock dividends are more costly to administer than cash dividend especially in periodic stock dividends.

4.   Theories on Dividend Policies

4.1 Traditional Position: According to the traditional position expounded by Graham and Dodd, the following model can be used for the valuation of shares:

P = m (D + E/3)

Where,

P = Market Price per share

D = Dividend per share

E = Earnings per share

m = a Multiplier.

This model attaches four times weight to dividends against retained earnings. These weights are based on subjective judgments and not derived from objective empirical analysis.

4.2 Walter Approach: This approach shows how dividend can be used to maximize the share price.. The relationship between dividend and share price on the basis of Walter's formula is shown below:

$$V_c = \frac{D + \dfrac{R_a}{R_c}(E - D)}{R_c}$$

Where,

V_c =Market value of the ordinary shares of the company

R_a =Return on internal retention, i.e., the rate company earns on retained profits

R_c =Cost of Capital

E   =Earnings per share

D   =Dividend per share.

The formula explains why market prices of shares of growth 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.

4.3 Gordon Growth Model: This model explicitly relates the market value of the firm to dividend policy. It is based on the following assumptions:

- The firm is an all equity firm, and it has no debt.

- No external financing is used and investment programmes are financed exclusively by retained earnings.

- The internal rate of return, r, of the firm is constant.

- The appropriate discount rate, k_e, for the firm remains constant.

- The firm has perpetual life.

- The retention ratio, b, once decided upon, is constant. Thus, the growth rate, g = br, is also constant.

- The discount rate is greater than the growth rate, k_e> br.

Myron Gordon argues that what is available at present is preferable to what may be available in the future. The relationship between dividend and share price on the basis of Gordon's formula is shown as:

$$V_E = \left[\frac{d_o\,(1+g)}{k_e - g} \right]$$

Where,

V_E = 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 where the rate of return is greater than the discount rate(K_e), the share price increases and vice-versa. In case the both are equal, the price remains unchanged.

4.4 Modigliani and Miller (MM) Hypothesis: Modigliani and Miller Hypothesis is in support of the irrelevance of dividends means firm's dividend policy has no effect on value of shares..

The hypothesis is based on the following assumptions:

- The firm operates in perfect capital markets.

- There are no taxes on dividend and capital gains.

- The firm has a fixed investment policy.

- There are no floatation or transaction costs.

- Non existence of uncertainty risk.

MM Hypothesis is based on the arbitrage argument. Market price of a share after dividend declared on the basis of MM model is shown below:

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

Where,

P_0	=	The prevailing market price of a share
K_e	=	The cost of equity capital
D_1	=	Dividend to be received at the end of period one
P_1	=	Market price of a share at the end of period one.

If the firm were to finance all investment proposals, the total amount raised through new shares will be ascertained with the help of the following formula:

$$\Delta N = \frac{I - (E - nD_1)}{P_1}$$

Where,

ΔN = Change in the number of shares outstanding during the period

n = Number of shares outstanding at the beginning of the period

I = Total investment amount required for capital budget

E = Earnings of net income of the firm during the period.

The concept of 'home made dividends' supports the argument for irrelevance of dividend policy in shareholder wealth maximization. Due to reduction in the price of a share when it goes 'ex-dividend', the value of a shareholder's wealth is always the same irrespective of the amount of dividend declared. A shareholder can always sell his portion of equity to realize the dividend income.

4.5 Lintner's Model: The classic study of the actual dividend behaviour was done by John Lintner in 1956. His formula is

$D_1 = D_0 + [(EPS \times Target\ Payout) - D_0] \times A_F$

Where

D_1 = Dividend in year 1

D_0 = Dividend in year 0

EPS = Earning Per Share

AF = Adjustment Factor

Lintner model has two parameters:

(1) The target pay-out ratio and

(2) The spread at which current dividends adjust to the target.

4.6 Radical Approach: The approach is based on one premise that if tax on dividend is higher than tax on capital gains, the share of the company will be attractive if the company is offering capital gain and vice versa.

4.7 Dividend Discount Model:

- The share price is valued as the net present value of all expected future divided payment discounted by an appropriate risk-adjusted rate.

- This dividend discount model price is the intrinsic value of the stock.

- The required rate of return (capitalization rate) is the rate of return required by investors to compensate them for the risk of owning the security.

Intrinsic Value = Sum of PV of Future Dividends + PV of Stock Sale Price

Stock intrinsic Value = $\dfrac{D_1}{(1+K)^1} + \dfrac{D_2}{(1+K)^2} + ... + \dfrac{D_n}{(1+k)^n} + \dfrac{p}{(1+k)^n}$

P = Selling Price of Stock

D = Annual Dividend Payment

k = Capitalization Rate

n = Number of Years until Stock is Sold;

There are 3 models used in the dividend discount model:

(a) Zero-Growth Rate DDM

It assumes that all dividends paid always stays the same.

Stock's Intrinsic Value = Annual Dividends / Required Rate of Return

(b) Constant-Growth Rate DDM (Gordon Growth Model)

It assumes that dividends grow by a specific percent annually.

Constant-Growth Rate DDM Formula

Intrinsic Value (P) = $\dfrac{D_1}{k-g}$

D_1 = Next Year's Dividend

k = Capitalization Rate

g = Dividend Growth Rate

Above formula can also be transformed to calculate implied growth rate (g), then using the result to calculate the implied return on equity.

Implied Growth Rate (g) = k - $\dfrac{D_1}{P}$

$$\text{Implied Return on Equity} = \frac{\text{Implied Growth Rate}}{\text{Earnings Retention Rate}}$$

(c) Variable-Growth Rate DDM

- It assumes that the growth rate of dividend is different for every year.

- The most common form is assuming 3 different rates of growth: an initial high rate, a transition to slower rate, and lastly, a sustainable, steady rate.

- 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.