Gordon Model

Meaning of Gordon Model

The Gordon Growth Model, also known as a version of the dividend discount model (DDM), is a method for calculating the intrinsic value of a stock, exclusive of current market conditions. The model equates this value to the present value of a stock's future dividends.

The model is named in the 1960s after Professor Myron J. Gordon, but Gordon was not the only financial scholar to popularize the model. In the 1930s, Robert F. Weise and John Burr Williams also produced significant work in this area.

Assumptions of Gordon's Model

Gordon's model is based on the following assumptions:

1. No debt

The model assumes that the company is an all equity company, with no proportion of debt in the capital structure.

2. No external financing

The model assumes that all investment of the company is financed by retained earnings and no external financing is required.

3. Constant IRR

The model assumes a constant Internal Rate of Return (r), ignoring the diminishing marginal efficiency of the investment.

4. Constant Cost of Capital

The model is based on the assumption of a constant cost of capital (k), implying the business risk of all the investments to be the same.

5. Perpetual Earnings

Gordon's model believes in the theory of perpetual earnings for the company.

6. Corporate Taxes

Corporate taxes are not accounted for in this model.

7. Constant Retention Ratio

The model assumes a constant retention ratio (b) once it is decided by the company. Since the growth rate (g) = b*r, the growth rate is also constant by this logic.

K>G

Gordon's model assumes that the cost of capital (k) > growth rate (g). This is important for obtaining the meaningful value of the company's share.

Formula for Gordon Model

According to the Gordon's Model, the market value of the share is equal to the present value of future dividends. It is represented as:

P = [E (1-b)] / Ke-br

Where, P = price of a share

E = Earnings per share

b = retention ratio

1-b = proportion of earnings distributed as dividends

Ke = capitalization rate

Br = growth rate

Relation of Dividend Decision and Value of a Firm

The Gordon's theory on dividend policy states that the company's dividend payout policy and the relationship between its rate of return (r) and the cost of capital (k) influence the market price per share of the company.

Relationship between r and k	**Increase in Dividend Payout**
r>k	Price per share decreases
r<k	Price per share increases
r=k	No change in the price per share

Criticism of Gordon's Model

1. It is assumed that firm's investment opportunities are financed only through the retained earnings and no external financing viz. Debt or equity is raised. Thus, the investment policy or the dividend policy or both can be sub-optimal.
2. The Gordon's Model is only applicable to all equity firms. It is assumed that the rate of returns is constant, but, however, it decreases with more and more investments.
3. It is assumed that the cost of capital (K) remains constant but, however, it is not realistic in the real life situations, as it ignores the business risk, which has a direct impact on the firm's value.

Thus, Gordon model posits that the dividend plays an important role in determining the share price of the firm.

Walter's Model

According to the Walter's Model, given by prof. James E. Walter, the dividends are relevant and have a bearing on the firm's share prices. Also, the investment policy cannot be separated from the dividend policy since both are interlinked.

Walter's Model shows the clear relationship between the return on investments or internal rate of return (r) and the cost of capital (K). The choice of an appropriate dividend policy affects the overall value of the firm. The efficiency of dividend policy can be shown through a relationship between returns and the cost.

- If **r>K,** the firm should retain the earnings because it possesses better investment opportunities and can gain more than what the shareholder can by re-investing. The firms with more returns than a cost are called the "Growth firms" and have a zero payout ratio.
- If **r<K,** the firm should pay all its earnings to the shareholders in the form of dividends, because they have better investment opportunities than a firm. Here the payout ratio is 100%.
- If **r=K,** the firm's dividend policy has no effect on the firm's value. Here the firm is indifferent towards how much is to be retained and how much is to be distributed among the shareholders. The payout ratio can vary from zero to 100%.

Relationship between r and k	**Increase in Dividend Payout**	**Decrease in Dividend Payout**
r>k	Value of the firm decreases	Value of the firm increases
r<k	Value of the firm increases	Value of the firm decreases
r=k	No change in the value of the firm	No change in the value of the firm

Assumptions of Walter's Model

Walter's model is based on the following assumptions:

1. Internal financing

All the investments are financed by the firm through retained earnings. No new equity is issued for the same.

2. Constant IRR and cost of capital

The internal rate of return (r) and the cost of capital (k) of the firm are constant. The business risks remain same for all the investment decisions.

3. Constant EPS and DPS

Beginning earnings and dividends of the firm never change. Though different values of EPS and DPS may be used in the model, but they are assumed to remain constant while determining a value.

4. Infinite life

The company has an infinite or a very long life.

5. Capital market is perfect

It means that information about all securities are available to all investors in equal proportion. Due to this assumption, there is no over pricing or under pricing of the security. Further it means that all investors are rational. It means all investors want to increase their return and reduce their risk.

6. No flotation cost, no transaction cost, no corporate dividend tax

It is assumed that, there is no cost to the company in issuing a security, there is no cost to investor to buy or sell a security and there is no corporate dividend tax. All of them have been

eliminated because these things do not remain same for all the companies universally and this theory is to be applied universally.

7. Only equity finance

A company can have only equity finance. It includes equity share capital and reserves and surplus. There is no source of finance like preference share capital or debentures. Preference share capital is a hybrid source of finance; it includes certain features of debt and certain features of equity. So, it is eliminated by making this assumption. Further, in case of debt financing there is a chance of trading on equity, so with that rate of earning of the company will keep on changing. Hence it is also eliminated. Trading on equity means borrowing at a lower rate and earning at a higher rate.

Formula for Walter's Model

Walter's formula to determine the market price per share (P) is as follows:

P = D/K +r (E-D)/K/K

The above equation clearly reveals that the market price per share is the sum of the present value of two sources of income:

i) The present value of an infinite stream of constant dividends, (D/K) and

ii) The present value of the infinite stream of stream gains.

[r (E-D)/K/K]

Criticism

Walter's model is quite useful to show the effects of dividend policy on an all equity firm under different assumptions about the rate of return. However, the simplified nature of the model can lead to conclusions which are net true in general, though true for Walter's model.

The criticisms on the model are as follows:

1. Walter's model of share valuation mixes dividend policy with investment policy of the firm. The model assumes that the investment opportunities of the firm are financed by retained earnings only and no external financing debt or equity is used for the purpose when such a situation exists either the firm's investment or its dividend policy or both will be sub-optimum. The wealth of the owners will maximize only when this optimum investment in made.

2. Walter's model is based on the assumption that r is constant. In fact decreases as more investment occurs. This reflects the assumption that the most profitable investments are made first and then the poorer investments are made.

The firm should step at a point where r = k. This is clearly an erroneous policy and fall to optimize the wealth of the owners.

3. A firm's cost of capital or discount rate, K, does not remain constant; it changes directly with the firm's risk. Thus, the present value of the firm's income moves inversely with the cost of capital. By assuming that the discount rate, K is constant, Walter's model abstracts from the effect of risk on the value of the firm.

Modigliani-Miller Approach

This approach was devised by Modigliani and Miller during the 1950s. The fundamentals of the Modigliani and Miller Approach resemble that of the Net Operating Income Approach. Modigliani and Miller advocate capital structure irrelevancy theory, which suggests that the valuation of a firm is irrelevant to the capital structure of a company. Whether a firm is highly leveraged or has a lower debt component in the financing mix has no bearing on the value of a firm.

The Modigliani and Miller Approach further states that the market value of a firm is affected by its operating income, apart from the risk involved in the investment. The theory stated that the value of the firm is not dependent on the choice of capital structure or financing decisions of the firm.

Assumptions of M-M Approach

The MM proposition is based on the following assumptions:

(a) Existence of Perfect Capital Market:

It includes that:

(i) There is no transaction cost;

(ii) Floatation cost is neglected;

(iii) No investor can affect the market price of shares;

(iv) Information is available to all without cost;

(v) Investors are free to purchase and sale of securities.

(b) Homogeneous Risk Class/Equivalent Risk Class:

It means that the expected yield/return have the identical risk factor, i.e., business risk is equal among all firm having equivalent operational condition.

(c) Homogenous Expectation:

All the investors should have identical estimate about the future rate of earnings of each firm.

(d) The Dividend Pay-out Ratio is 100%:

It means that the firm must distribute all of its earnings in the form of dividend among the shareholders/investors, and

(e) Taxes do not Exist:

That is, there will be no corporate tax effect (although this was removed at a subsequent date).

The M&M Theorem in Perfectly Efficient Markets

This is the first version of the M&M Theorem with the assumption of perfectly efficient markets. The assumption implies that companies operating in the world of perfectly efficient markets do not pay any taxes, the trading of securities is executed without any transaction costs, bankruptcy is possible but there are no bankruptcy costs, and information is perfectly symmetrical.

Proposition 1 (M&M I):

$$V_L = V_U$$

Where:

- V_U = Value of the unlevered firm (financing only through equity)
- V_L = Value of the levered firm (financing through a mix of debt and equity)

The first proposition essentially claims that the company's capital structure does not impact its value. Since the value of a company is calculated as the present value of future cash flows, the capital structure cannot affect it. Also, in perfectly efficient markets, companies do not pay any taxes. Therefore, the company with a 100% leveraged capital structure does not obtain any benefits from tax-deductible interest payments.

Proposition 2 (M&M I):

$$r_E = r_a + \frac{D}{E}(r_a - r_D)$$

Where:

- r_E = Cost of levered equity
- r_a = Cost of unlevered equity

- r_D = Cost of debt
- D/E = Debt-to-equity ratio

The second proposition of the M&M Theorem states that the company's cost of equity is directly proportional to the company's leverage level. An increase in leverage level induces higher default probability to a company. Therefore, investors tend to demand a higher cost of equity (return) to be compensated for the additional risk.

Criticisms of the M-M Approach

We have seen (while discussing M-M Hypothesis) that M-M Hypothesis is based on some assumptions. There are some authorities who do not recognize such assumption as they are quite unrealistic, viz. the assumption of perfect capital market. We also know that most significant element in this approach is the arbitrage process forming the behavioral foundation of the M-M Hypothesis.

As the imperfect market exist, the arbitrage process will be of no use and as such, the discrepancy will arise between the market value of the unlevered and levered firms. The followings are the shortcomings for which arbitrage process fails to bring the equilibrium condition.

(i) Existence of Transaction Cost:

The arbitrage process is affected by the transaction cost. While buying securities, this cost is involved in the form of brokerage or commission etc. for which extra amount is to be paid which increase the cost price of the shares and requires a greater amount although the return is same. As such, the levered firm will enjoy a higher market value than the unlevered firm.

(ii) Assumption of Borrowing and Lending by the Firms and the Individual at the Same Rate of Interest:

The above proposition, that is, the firms and the individuals can borrow or lend at the same rate of interest, does not hold good in reality. Since a firm holds more assets and credit reputation in

the open market in comparison with an individual, the former will always enjoy a better position than the later.

As such, cost of borrowing will be higher in case of individual than the firm. As a result the market value of both the firms will not be equal.

(iii) Institutional Restriction:

The arbitrage process is retarded by the institutional investor e.g., Life Insurance Corporation of India, Commercial bank. Unit Trust of India etc., i.e., they do not encourage personal leverage. At present these institutional investors dominate the capital market

(iv) "Personal or Home-made, leverage" is not the perfect substitute for **"Corporate leverage."**

M-M Hypothesis assumes that "personal leverage" is a perfect substitute for "corporate" leverage which is not true as we know a firm may have a limited liability whereas there is unlimited liability in case of individuals. For this purpose, both of them have a different footing in the capital market.

(v) Incorporation of Corporate Taxes:

If corporate taxes are considered (which should be taken into consideration) the M-M approach will be unable to discuss the relationship between the value of the firm and the financing decision. For example we know that interest charges are deducted from profit available for dividend i.e., it is tax deductible.

In other words, the cost of borrowing funds is comparatively less than the contractual rate of interest which allows the firm regarding tax advantage. Ultimately, the benefit is being enjoyed by the equity holders and debt holders.

According to some critics the arguments which were advocated by M-M, are not valid in the practical world. We know that cost of capital and the value of the firm are practically is the product of financial leverage.