4
Dividend Decisions

Question 1

Write short note on effect of a Government imposed freeze on dividends on stock prices and the volume of capital investment in the background of Miller-Modigliani (MM) theory on dividend policy.

Answer

Effect of a Government Imposed Freeze on Dividends on Stock Prices and the Volume of Capital Investment in the Background of (Miller-Modigliani) (MM) Theory on Dividend Policy

According to MM theory, under a perfect market situation, the dividend of a firm is irrelevant as it does not affect the value of firm. Thus under MM's theory the government imposed freeze on dividend should make no difference on stock prices. Firms if do not pay dividends will have higher retained earnings and will either reduce the volume of new stock issues, repurchase more stock from market or simply invest extra cash in marketable securities. In all the above cases, the loss by investors of cash dividends will be made up in the form of capital gains. Whether the Government imposed freeze on dividends have effect on volume of capital investment in the background of MM theory on dividend policy have two arguments. One argument is that if the firms keep their investment decision separate from their dividend and financing decision then the freeze on dividend by the Government will have no effect on volume of capital investment. If the freeze restricts dividends the firm can repurchase shares or invest excess cash in marketable securities e.g. in shares of other companies. Other argument is that the firms do not separate their investment decision from dividend and financing decisions. They prefer to make investment from internal funds. In this case, the freeze of dividend by government could lead to increased real investment.

Question 2

Write short note on factors determining the dividend policy of a company.

Answer

Factors Determining the Dividend Policy of a Company

(i) Liquidity: In order to pay dividends, a company will require access to cash. Even very profitable companies might sometimes have difficulty in paying dividends if resources are tied up in other forms of assets.

(ii)   Repayment of debt: Dividend payout may be made difficult if debt is scheduled for repayment.

(iii) Stability of Profits: Other things being equal, a company with stable profits is more likely to pay out a higher percentage of earnings than a company with fluctuating profits.

(iv)   Control: The use of retained earnings to finance new projects preserves the company's ownership and control. This can be advantageous in firms where the present disposition of shareholding is of importance.

(v)   Legal consideration: The legal provisions lay down boundaries within which a company can declare dividends.

(vi)   Likely effect of the declaration and quantum of dividend on market prices.

(vii) Tax considerations and

(viii) Others such as dividend policies adopted by units similarly placed in the industry, management attitude on dilution of existing control over the shares, fear of being branded as incompetent or inefficient, conservative policy Vs non-aggressive one.

(ix)   Inflation: Inflation must be taken into account when a firm establishes its dividend policy.

Question 3

What are the determinants of Dividend Policy?

Answer

Determinants of dividend policy

Many factors determine the dividend policy of a company. Some of the factors determining the dividend policy are:

(i)   **Dividend Payout ratio:** A certain share of earnings to be distributed as dividend has to be worked out. This involves the decision to pay out or to retain. The payment of dividends results in the reduction of cash and, therefore, depletion of assets. In order to maintain the desired level of assets as well as to finance the investment opportunities, the company has to decide upon the payout ratio. D/P ratio should be determined with two bold objectives – maximising the wealth of the firms' owners and providing sufficient funds to finance growth.

(ii) **Stability of Dividends:** Generally investors favour a stable dividend policy. The policy should be consistent and there should be a certain minimum dividend that should be paid regularly. The liability can take any form, namely, constant dividend per share; stable D/P ratio and constant dividend per share plus something extra. Because this entails – the investor's desire for current income, it contains the information content about the profitability or efficient working of the company; creating interest for institutional investor's etc.

(iii) **Legal, Contractual and Internal Constraints and Restriction:** Legal and Contractual requirements have to be followed. All requirements of Companies Act, SEBI guidelines, capital impairment guidelines, net profit and insolvency etc., have to be kept in mind while declaring dividend. For example, insolvent firm is prohibited from paying dividends; before paying dividend accumulated losses have to be set off, however, the dividends can be paid out of current or previous years' profit. Also there may be some contractual requirements which are to be honoured. Maintenance of certain debt equity ratio may be such requirements. In addition, there may be certain internal constraints which are unique to the firm concerned. There may be growth prospects, financial requirements, availability of funds, earning stability and control etc.

(iv) **Owner's Considerations:** This may include the tax status of shareholders, their opportunities for investment dilution of ownership etc.

(v) **Capital Market Conditions and Inflation:** Capital market conditions and rate of inflation also play a dominant role in determining the dividend policy. The extent to which a firm has access to capital market, also affects the dividend policy. A firm having easy access to capital market will follow a liberal dividend policy as compared to the firm having limited access. Sometime dividends are paid to keep the firms 'eligible' for certain things in the capital market. In inflation, rising prices eat into the value of money of investors which they are receiving as dividends. Good companies will try to compensate for rate of inflation by paying higher dividends. Replacement decision of the companies also affects the dividend policy.

Question 4

How tax considerations are relevant in the context of a dividend decision of a company?

Answer

Dividend Decision and Tax Considerations

Traditional theories might have said that distribution of dividend being from after-tax profits, tax considerations do not matter in the hands of the payer-company. However, with the arrival of Corporate Dividend Tax on the scene in India, the position has changed. Since there is a clear levy of such tax with related surcharges, companies have a consequential cash outflow due to their dividend decisions which has to be dealt with as and when the decision is taken.

In the hands of the investors too, the position has changed with total exemption from tax being made available to the receiving-investors. In fact, it can be said that such exemption from tax has made the equity investment and the investment in Mutual Fund Schemes very attractive in the market.

Broadly speaking Tax consideration has the following impacts on the dividend decision of a company:

Before Introduction of Dividend Tax: Earlier, the dividend was taxable in the hands of investor. In this case the shareholders of the company are corporates or individuals who are in

higher tax slab; it is preferable to distribute lower dividend or no dividend. Because dividend will be taxable in the hands of the shareholder @ 30% plus surcharges while long term capital gain is taxable @ 10%. On the other hand, if most of the shareholders are the people who are in no tax zone, then it is preferable to distribute more dividends.

We can conclude that before distributing dividend, company should look at the shareholding pattern.

After Introduction of Dividend Tax: Dividend tax is payable @ 12.5% - surcharge + education cess, which is effectively near to 14%. Now if the company were to distribute dividend, shareholder will indirectly bear a tax burden of 14% on their income. On the other hand, if the company were to provide return to shareholder in the form of appreciation in market price – by way of Bonus shares – then shareholder will have a reduced tax burden. For securities on which STT is payable, short term capital gain is taxable @ 10% while long term capital gain is totally exempt from tax.

Therefore, we can conclude that if the company pays more and more dividend (while it still have reinvestment opportunities) then to get same after tax return shareholders will expect more before tax return and this will result in lower market price per share.

Question 5

According to the position taken by Miller and Modigliani, dividend decision does not influence value. Please state briefly any two reasons, why companies should declare dividend and not ignore it.

Answer

The position taken by M & M regarding dividend does not take into account certain practical realities is the market place. Companies are compelled to declare annual cash dividends for reasons cited below:-

(i)   Shareholders expect annual reward for their investment as they require cash for meeting needs of personal consumption.

(ii)   Tax considerations sometimes may be relevant. For example, dividend might be tax free receipt, whereas some part of capital gains may be taxable.

(iii)   Other forms of investment such as bank deposits, bonds etc, fetch cash returns periodically, investors will shun companies which do not pay appropriate dividend.

(iv)   In certain situations, there could be penalties for non-declaration of dividend, e.g. tax on undistributed profits of certain companies.

Question 6

Write a short note on assumptions of Modigliani & Miller Hypothesis.

Answer

The Modigliani & Miller hypothesis is based on the following assumptions:

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

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

(iii)   The firm has a fixed investment policy.

(iv)   There are no floatation or transaction costs.

(v)   Risk of uncertainty does not exist. Investors are able to forecast future prices and dividends with certainty, and

(vi)   one discount rate is appropriate for all securities and all time periods. Thus, $r = k = k_t$ for all t.

Question 7

Write a short note on Traditional & Walter Approach to Dividend Policy

Answer

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.

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. 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.

Walter Model focuses on two factors which influences Market Price

(i) Dividend Per Share.

(ii) Relationship between Internal Rate of Return (IRR) on retained earnings and market expectations (cost of capital).

If IRR > Cost of Capital, Share price can be even higher in spite of low dividend. The relationship between dividend and share price on the basis of Walter's formula is shown below:

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

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.

Question 8

Sahu & Co. earns ₹ 6 per share having capitalisation rate of 10 per cent and has a return on investment at the rate of 20 per cent. According to Walter's model, what should be the price per share at 30 per cent dividend payout ratio? Is this the optimum payout ratio as per Walter?

Answer

Walter Model is $V_c = \dfrac{D + \dfrac{R_a}{R_c}(E - D)}{R_c}$

Where:

V_c = Market value of the share

R_a = Return on Retained earnings

R_c = Capitalisation Rate

E = Earning per share

D = Dividend per share

Hence, if Walter model is applied

Market Value of the Share $= \dfrac{1.80 + \dfrac{.20}{.10}(6 - 1.80)}{0.10}$ P $= \dfrac{1.80 + \dfrac{.20}{.10}(4.20)}{0.10}$

$$P = \dfrac{1.80 + 8.40}{0.10} \; P = ₹\,102$$

This is not the optimum payout ratio because $R_a > R_c$ and therefore V_c can further go up if payout ratio is reduced.

Question 9

You are requested to find out the approximate dividend payment ratio as to have the Share Price at ₹ 56 by using Walter Model, based on following information available for a Company.

	Amount ₹
Net Profit	*50 lakhs*
Outstanding 10% Preference Shares	*80 lakhs*
Number of Equity Shares	*5 lakhs*
Return on Investment	*15%*
Cost of Capital (after Tax) (Kₑ)	*12%*

Answer

(i)

	₹ in lakhs
Net Profit	50
Less: Preference dividend	8
Earning for equity shareholders	42
Therefore earning per share	₹ 42 lakhs / 5 lakhs = ₹ 8.40

(ii) Cost of capital i.e. (k_e)   12%

Let, the dividend payout ratio be X and so the share price will be:

$$P = \frac{D}{K_e} + \frac{\frac{r(E-D)}{K_e}}{K_e}$$ where D= Dividend (Rs) and r= 15 % and ke = 12%.

Here D = 8.40x; E = ₹ 8.40; r = 0.15 and K_e = 0.12 and P = ₹ 56

Hence ₹ $56 = \frac{8.40x}{0.12} + \frac{0.15\,(8.40 - 8.40x)}{0.12 \times 0.12}$

Or, ₹ 56 = 70X + 87.50 (1 –x)

   -17.50x = -31.50

x = 1.80

Dividend Pay-out ratio would be zero, as pay-out is more than 100% of EPS seems to be illogical.

Question 10

Goldi locks Ltd. was started a year back with equity capital of ₹ 40 lakhs. The other details are as under:

Earnings of the company	*₹ 4,00,000*
Price Earnings ratio	*12.5*
Dividend paid	*₹ 3,20,000*
Number of Shares	*40,000*

Find the current market price of the share. Use Walter's Model.

Find whether the company's D/ P ratio is optimal, use Walter's formula.

Answer

Goldilocks Ltd.

(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 = ₹ 10

   D   =   Dividend per share = ₹ 8

r = Return earned on investment = 10%

K_e = Cost of equity capital = 1/12.5 = 8%

$$P = \frac{8+(10-8)\times\dfrac{0.10}{0.08}}{0.08} = \frac{8+2\times\dfrac{0.10}{0.08}}{0.08}$$

= ₹ 131.25

(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:

$$\frac{0+(10-0)\dfrac{0.10}{0.08}}{0.08} = ₹156.25$$

Question 11

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?

Answer

(a) M/s XY Ltd.

(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%

$$P = \frac{3+(5\text{-}3)\times\dfrac{0.15}{0.12}}{0.12} = \frac{3+2\times\dfrac{0.15}{0.12}}{0.12}$$

=   ₹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:

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

Question 12

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

(i)   Ascertain whether the company is the 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?

Answer

(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

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

$$= \frac{0}{.08} + \frac{(.10/.80)(10-0)}{.08}$$

= ₹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

The optimal dividend policy for the firm would be to pay 100% dividend and market price of share in such case would be

$$P = \frac{10.0}{0.125} + \frac{(0.1/0.125)(10-10)}{0.125}$$

= ₹ 80

Question 13

The following information relates to Maya Ltd:

Earnings of the company	₹ 10,00,000
Dividend payout ratio	60%
No. of Shares outstanding	2,00,000
Rate of return on investment	15%
Equity capitalization rate	12%

(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?

Answer

MAYA Ltd.

(i)   Walter's model is given by –

$$p = \frac{D + (E - D)(\gamma / k_e)}{k_e}$$

Where, p = Market price per share,

E = Earning per share – ₹ 5

D = Dividend per share – ₹ 3

γ = Return earned on investment – 15%

k_e = Cost of equity capital – 12%

$$\therefore p = \frac{3 + (5 - 3) \times \dfrac{0.15}{0.12}}{0.12} = \frac{3 + 2 \times \dfrac{.15}{.12}}{.12} = ₹\ 45.83$$

(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 payout ratio of zero, the market value of the company's share will be:-

$$\frac{0 + (5 - 0) \times \dfrac{.15}{.12}}{0.12} = ₹\ 52.08$$

Question 14

Subhash & Co. earns ₹ 8 per share having capitalisation rate of 10 per cent and has a return on investment at the rate of 20 per cent. According to Walter's model, what should be the price per share at 25 per cent dividend payout ratio? Is this the optimum payout ratio as per Walter's Model?

Answer

Walter Model is as follows:-

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

V_c =   Market value of the share

R_a =   Return on retained earnings

R_e =   Capitalisation rate

E =   Earnings per share

D =   Dividend per share

Hence, if Walter model is applied-

Market value of the share $V_C = \dfrac{₹\,2.00 + \dfrac{0.20}{0.10}(₹\,8.00 - ₹\,2.00)}{0.10}$

or

$$V_C = \frac{₹\,2.00 + \dfrac{0.20}{0.10}(₹\,6.00)}{0.10}$$

or

$$V_C = \frac{₹\,2.00 + ₹\,2.00}{0.10} = \frac{₹14.00}{0.10} = ₹140$$

This is not the optimum payout ratio because $R_a > R_c$ and therefore V_e can further group if payout ratio is reduced.

Question 15

The earnings per share of a company is ₹ 10 and the rate of capitalisation applicable to it is 10 per cent. The company has three options of paying dividend i.e.(i) 50%,(ii)75% and (iii)100%. Calculate the market price of the share as per Walter's model if it can earn a return of (a) 15, (b) 10 and (c) 5 per cent on its retained earnings.

Answer

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

Where

    P= Price of Share

    R= Rate of Earning

    Ke = Rate of Capitalisation or Cost of Equity

		(i)	(ii)	(iii)
		DP ratio 50%	DP ratio 75%	DP ratio 100%
(a)	Price of Share if r =15%	$\dfrac{5 + \left(\frac{.15}{.10}\right)(10-5)}{.10}$	$\dfrac{7.5 + \left(\frac{.15}{.10}\right)(10-7.5)}{.10}$	$\dfrac{10 + \left(\frac{.15}{.10}\right)(10-10)}{.10}$
		$\dfrac{12.5}{.10}$	$\dfrac{11.25}{.10}$	$\dfrac{10}{.10}$
		₹ 125	₹ 112.5	₹ 100
(b)	Price of Share if r = 10%	$\dfrac{5 + \left(\frac{.10}{.10}\right)(10-5)}{.10}$	$\dfrac{7.5 + \left(\frac{.10}{.10}\right)(10-7.5)}{.10}$	$\dfrac{10 + \left(\frac{.10}{.10}\right)(10-10)}{.10}$
		$\dfrac{10}{.10} = ₹ 100$	$\dfrac{10}{.1} = 100$	$\dfrac{10}{.1} = ₹ 100$
(c)	Price of Share if r = 5%	$\dfrac{5 + \left(\frac{.05}{.10}\right)(10-5)}{.10}$	$\dfrac{7.5 + \left(\frac{.05}{.10}\right)(10-7.5)}{.10}$	$\dfrac{10 + \left(\frac{.05}{.10}\right)(10-10)}{.10}$
		$\dfrac{7.5}{.10} = ₹ 75$	$\dfrac{8.75}{.10} = 87.5$	$\dfrac{10}{.1} = ₹ 100$

Question 16

X Ltd has an internal rate of return @ 20%. It has declared dividend @ 18% on its equity shares, having face value of ₹ 10 each. The payout ratio is 36% and Price Earning Ratio is 7.25. Find the cost of equity according to Walter's Model and hence determine the limiting value of its shares in case the payout ratio is varied as per the said model.

Answer

Internal Rate of Return (r)   =   0.20

Dividend (D)   =   1.80

Earnings Per share (E)   = $\dfrac{1.80}{0.36} = 5$

Price of share (P)   = 5 x 7.25   = 36.25

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

$$36.25 = \dfrac{1.80 + \dfrac{0.20(5 - 1.80)}{ke}}{k_e}$$

$$36.25\,K_e = 1.80 + \dfrac{0.20(3.20)}{K_e}$$

$$36.25\,K_e = 1.80 + \dfrac{0.64}{K_e}$$

$$36.25\,K_e^2 = 1.80\,K_e + 0.64$$

$$K_e = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \dfrac{-1.80 \pm \sqrt{(1.80)^2 - 4 \times (-36.25) \times 0.64}}{2 \times (-36.25)}$$

$$= \dfrac{-1.80 \pm \sqrt{3.24 + 92.80}}{-72.50}$$

$$K_e = 16\%$$

Alternatively, it can also be calculated as follows:

$36.25\,K_e^2 - 1.80\,K_e - 0.64 = 0$

Taking 36.25 common

$K_e^2 - 0.05\,K_e - 0.0176 = 0$

$K_e^2 - 0.16\,K_e + 0.11\,K_e - 0.0176 = 0$

$K_e (K_e – 0.16) + 0.11 (K_e – 0.16) = 0$

$(K_e + 0.11) (K_e – 0.16) = 0$

Since K_e = -0.11 is not possible, the possible answer shall be K_e = 0.16 i.e. 16%.

Since the firm is a growing firm, then 100% payout ratio will give limiting value of share

$$P = \frac{5.00 + \dfrac{0.20(5-5)}{0.16}}{0.16}$$

$$= \frac{5.00}{0.16}$$

$$= ₹\ 31.25$$

Thus limiting value is ₹ 31.25

Alternatively, 0% payout ratio gives limiting value of shares as follows:

$$P = \frac{0 + \dfrac{0.20(5-0)}{0.16}}{0.16}$$

$$= \frac{1}{(0.16)^2}$$

$$= ₹\ 39.06$$

Thus, limiting value is ₹ 39.06

Question 17

The following information is collected from the annual reports of J Ltd:

Profit before tax	*₹ 2.50 crore*
Tax rate	*40 percent*
Retention ratio	*40 percent*
Number of outstanding shares	*50,00,000*
Equity capitalization rate	*12 percent*
Rate of return on investment	*15 percent*

What should be the market price per share according to Gordon's model of dividend policy?

Answer

Gordon's Formula

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

P_0 = Market price per share

E = Earnings per share (₹ 1.50crore/ 50,00,000) = ₹ 3

K = Cost of Capital = 12%

b = Retention Ratio (%) = 40%

r = IRR = 15%

br = Growth Rate (0.40X15%) = 6%

$$P_0 = \frac{3(1\text{-}0.40)}{0.12\text{-}0.06}$$

$$= \frac{1.80}{0.12\text{-}0.06} = \frac{₹1.80}{0.06}$$

= ₹ 30.00

Question 18

Mr. A is contemplating purchase of 1,000 equity shares of a Company. His expectation of return is 10% before tax by way of dividend with an annual growth of 5%. The Company's last dividend was ₹ 2 per share. Even as he is contemplating, Mr. A suddenly finds, due to a Budget announcement Dividends have been exempted from Tax in the hands of the recipients. But the imposition of Dividend Distribution Tax on the Company is likely to lead to a fall in dividend of 20 paise per share. A's marginal tax rate is 30%.

Required:

Calculate what should be Mr. A's estimates of the price per share before and after the Budget announcement?

Answer

The formula for determining value of a share based on expected dividend is:

$$P_0 = \frac{D_0\,(1+g)}{(k-g)}$$

Where

   P_0 = Price (or value) per share

   D_0 = Dividend per share

g = Growth rate expected in dividend

k = Expected rate of return

Hence,

Price estimate before budget announcement:

$$P_0 = \frac{2 \times (1 + 0.05)}{(0.10 - 0.05)} = ₹ \ 42.00$$

Price estimate after budget announcement:

$$P_0 = \frac{1.80 \times (1.05)}{(0.07 - 0.05)} = ₹ \ 94.50 \ \text{or} \ P_0 = \frac{2.00 \times 1.05 - 0.20}{(0.07 - 0.05)} = ₹ \ 95.00$$

Question 19

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 15.5%.

Answer

In this case the company has paid dividend of ₹2 per share during the last year. The growth rate (g) is 5%. Then, the current year dividend (D_1) with the expected growth rate of 5% will be ₹ 2.10

The share price is = P_o = $\dfrac{D_1}{K_e - g}$

$$= \frac{₹ \ 2.10}{0.155 - 0.05} = ₹ \ 20$$

In case the growth rate rises to 8% then the dividend for the current year. (D_1) would be ₹ 2.16 and market price would be-

$$= \frac{₹ \ 2.16}{0.155 - 0.08}$$

$$= ₹ \ 28.80$$

In case growth rate falls to 3% then the dividend for the current year (D_1) would be ₹ 2.06 and market price would be-

$$= \frac{₹ \ 2.06}{0.155 - 0.03}$$

$$= ₹16.48$$

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

Question 20

The following information is given for QB Ltd.

Earning per share	*₹ 12*
Dividend per share	*₹ 3*
Cost of capital	*18%*
Internal Rate of Return on investment	*22%*
Retention Ratio	*75%*

Calculate the market price per share using

(i)   Gordon's formula

(ii)   Walter's formula

Answer

(i)   Gordon's Formula

Retention Ratio $= \dfrac{\text{EPS-Dividend Per Share}}{\text{EPS}} = \dfrac{₹12\text{-}₹3}{₹12} = 0.75$ i.e. 75%

$P_0 \quad = \quad \dfrac{E(1-b)}{K-br}$

P_0 = Present value of Market price per share

E = Earnings per share

K = Cost of Capital

b = Retention Ratio (%)

r = IRR

br = Growth Rate

$P_0 \quad = \quad \dfrac{12(1-0.75)}{0.18-(0.75 \times 0.22)}$

$\quad = \quad \dfrac{3}{0.18-0.165} = $ ₹ 200

(ii) Walter's Formula

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

V_c = Market Price

D = Dividend per share

R_a = IRR

R_c = Cost of Capital

E = Earnings per share

$$= \frac{₹3 + \dfrac{0.22}{0.18}(₹12 - ₹3)}{0.18}$$

$$= \frac{₹3 + ₹11}{0.18} = ₹77.77$$

Question 21

X Ltd., has 8 lakhs equity shares outstanding at the beginning of the year. The current market price per share is ₹ 120. The Board of Directors of the company is contemplating ₹ 6.4 per share as dividend. The rate of capitalisation, appropriate to the risk-class to which the company belongs, is 9.6%:

(i)   Based on M-M Approach, calculate the market price of the share of the company, when the dividend is – (a) declared; and (b) not declared.

(ii) How many new shares are to be issued by the company, if the company desires to fund an investment budget of ₹ 3.20 crores by the end of the year assuming net income for the year will be ₹ 1.60 crores?

Answer

Modigliani and Miller (M-M) – Dividend Irrelevancy Model:

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

Where,

P_o = Existing market price per share i.e. ₹ 120

P_1 = Market price of share at the year-end (to be determined)

D_1 = Contemplated dividend per share i.e. ₹ 6.4

K_e = Capitalisation rate i.e. 9.6%.

(i)   (a)   Calculation of share price when dividend is declared:

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

$$120 = \frac{P_1 + 6.4}{1 + 0.096}$$

$120 \times 1.096 = P_1 + 6.4$

$P_1 = 120 \times 1.096 - 6.4$

$\quad = 125.12$

(b)   Calculation of share price when dividend is not declared:

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

$$120 = \frac{P_1 + 0}{1 + 0.096}$$

$120 \times 1.096 = P_1 + 0$

$P_1 = 131.52$

(ii)   Calculation of No. of shares to be issued:

(₹ in lakhs)

Particulars	If dividend declared	If dividend not declared
Net Income	160	160
Less: Dividend paid	51.20	------
Retained earnings	108.80	160
Investment budget	320	320
Amount to be raised by issue of new shares (i)	211.20	160
Market price per share (ii)	125.12	131.52
No. of new shares to be issued (ii)	1,68,797.95	1,21,654.50
Or say	1,68,798	1,21,655

Question 22

ABC Ltd. has 50,000 outstanding shares. The current market price per share is ₹ 100 each. It hopes to make a net income of ₹ 5,00,000 at the end of current year. The Company's Board is considering a dividend of ₹ 5 per share at the end of current financial year. The company needs to raise ₹ 10,00,000 for an approved investment expenditure. The company belongs to

a risk class for which the capitalization rate is 10%. Show, how the M-M approach affects the value of firm if the dividends are paid or not paid.

Answer

A   When dividend is paid

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

$$100 = \frac{1}{1.10}(₹5 + P_1)$$

$$110 = ₹5 + P_1$$

$$P_1 = 105$$

(b)   Amount required to be raised from issue of new shares

₹ 10,00,000 – (₹ 5,00,000 – ₹ 2,50,000)

₹ 10,00,000 – ₹ 2,50,000 = ₹ 7,50,000

(c)   Number of additional shares to be issued

$$\frac{7,50,000}{105} = \frac{1,50,000}{21}$$ shares or say 7143 shares

(d)   Value of ABC Ltd.

(Number of shares × Expected Price per share)

i.e., (50,000 + 7,143) × ₹ 105 = ₹ 60,00,015

B   When dividend is not paid

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

$$100 = \frac{P_1}{1.10}$$

$$P_1 = 110$$

(b)   Amount required to be raised from issue of new shares

₹ 10,00,000 – ₹ 5,00,000 = ₹ 5,00,000

(c)   Number of additional shares to be issued

$$\frac{5,00,000}{110} = \frac{50,000}{11}$$ shares or say 4545 shares.

(d)   Value of ABC Ltd.,

(50,000 + 4,545) × ₹110

= ₹ 59,99,950

Thus, as per M.M. approach the value of firm in both situations will be the same.

Question 23

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. Show, how the MM approach affects the value of M Ltd. if dividends are paid or not paid.

Answer

A   When dividend is paid

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

$$100 = \frac{1}{1.10}(₹\,5 + P_1)$$

$$110 = ₹\,5 + P_1$$

$$P_1 = 105$$

    (b)   Amount required to be raised from issue of new shares

        ₹ 5,00,000 – (₹ 2,50,000 – ₹ 1,25,000)

        ₹ 5,00,000 – ₹ 1,25,000 = ₹ 3,75,000

    (c)   Number of additional shares to be issued

$$\frac{3,75,000}{105} = \frac{75,000}{21} \text{ shares or say 3572 shares}$$

    (d)   Value of M Ltd.

        (Number of shares × Expected Price per share)

        i.e., (25,000 + 3,572) × ₹ 105 = ₹ 30,00,060

B   When dividend is not paid

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

$$100 = \frac{P_1}{1.10}$$

$$P_1 = 110$$

    (b)   Amount required to be raised from issue of new shares

        ₹5,00,000 – 2,50,000 = 2,50,000

    (c)   Number of additional shares to be issued

$$\frac{2,50,000}{110} = \frac{25,000}{11} \text{ shares or say 2273 shares.}$$

    (d)   Value of M Ltd.,

        (25,000 + 2273) × ₹110

        = ₹ 30,00,030

Whether dividend is paid or not, the value remains the same.

Question 24

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%. What will be the market price of the share at the end of the year, if

(i)   a dividend is not declared?

(ii)   a 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.

Answer

As per MM model, the current market price of equity share is:

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

(i)   If the dividend is not declared:

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

$$100 = \frac{P_1}{1.12}$$

$$P_1 = ₹\ 112$$

The Market price of the equity share at the end of the year would be ₹ 112.

(ii) If the dividend is declared:

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

$$100 = \frac{10 + P_1}{1.12}$$

$$112 = 10 + P_1$$

$$P1 = 112 - 10 = ₹\ 102$$

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

(iii) In case the firm pays dividend of ₹ 10 per share out of total profits of ₹ 5,00,000 and plans to make new investment of ₹ 10,00,000, the number of shares to be issued may be found as follows:

Total Earnings	₹ 5,00,000
- Dividends paid	1,00,000
Retained earnings	4,00,000
Total funds required	10,00,000
Fresh funds to be raised	6,00,000
Market price of the share	102
Number of shares to be issued (₹6,00,000 / 102)	5,882.35

or, the firm would issue 5,883 shares at the rate of ₹102

Question 25

In December, 2011 AB Co.'s share was sold for ₹ 146 per share. A long term earnings growth rate of 7.5% is anticipated. AB Co. is expected to pay dividend of ₹ 3.36 per share.

(i)   What rate of return an investor can expect to earn assuming that dividends are expected to grow along with earnings at 7.5% per year in perpetuity?

(ii)   It is expected that AB Co. will earn about 10% on book Equity and shall retain 60% of earnings. In this case, whether, there would be any change in growth rate and cost of Equity?

Answer

(i)   According to Dividend Discount Model approach the firm's expected or required return on equity is computed as follows:

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

Where,

K_e = Cost of equity share capital

D_1 = Expected dividend at the end of year 1

P_0 = Current market price of the share.

g = Expected growth rate of dividend.

Therefore, $K_e = \frac{3.36}{146} + 7.5\%$

= 0.0230 +0.075 = 0.098

Or, K_e = 9.80%

(ii)   With rate of return on retained earnings (r) 10% and retention ratio (b) 60%, new growth rate will be as follows:

g= br   i.e.

= 0.10 X 0.60 = 0.06

Accordingly dividend will also get changed and to calculate this, first we shall calculate previous retention ratio (b_1) and then EPS assuming that rate of return on retained earnings (r) is same.

With previous Growth Rate of 7.5% and r =10% the retention ratio comes out to be:

0.075 =b_1 X 0.10

b_1 = 0.75 and payout ratio = 0.25

With 0.25 payout ratio the EPS will be as follows:

$$\frac{3.36}{0.25} = 13.44$$

With new 0.40 (1 – 0.60) payout ratio the new dividend will be

D_1 = 13.44 X 0.40 = 5.376

Accordingly new K_e will be

$$K_e = \frac{5.376}{146} + 6.0\%$$

or, K_e = 9.68%

Alternatively

EPS with 6% growth rate instead of 7.5%.

$$13.44 \times \frac{1.06}{1.075} = 13.25$$

With new 0.40 (1 – 0.60) payout ratio the new dividend will be

D_1 = 13.25 X 0.40 = 5.30

Accordingly new K_e will be

$$K_e = \frac{5.30}{146} + 6.0\%$$

or, K_e = 9.63%

Question 26

X Ltd. is a Shoes manufacturing company. It is all equity financed and has a paid-tip Capital of ₹ 10,00,000 (₹ 10 per share)

X Ltd. has hired Swastika consultants to analyse the future earnings. The report of Swastika consultants states as follows:

(i)   The earnings and dividend will grow at 25% for the next two years.

(ii) Earnings are likely to grow at the rate of 10% from 3rd year and onwards.

(iii) Further, if there is reduction in earnings growth, dividend payout ratio will increase to 50%.

The other data related to the company are as follows:

Year	EPS (₹)	Net Dividend per share (₹)	Share Price (₹)
2010	6.30	2.52	63.00
2011	7.00	2.80	46.00
2012	7.70	3.08	63.75
2013	8.40	3.36	68.75
2014	9.60	3.84	93.00

You may assume that the tax rate is 30% (not expected to change in future) and post tax cost of capital is 15%.

By using the Dividend Valuation Model, calculate

(i) Expected Market Price per share

(ii) P/E Ratio.

Answer

(a) The formula for the Dividend valuation Model is

$$P_0 = \frac{D_1}{K_e - g}$$

K_e = Cost of Capital

g = Growth rate

D_1= Dividend at the end of year 1

On the basis of the information given, the following projection can be made:

Year	EPS (₹)	DPS (₹)	PVF @15%	PV of DPS (₹)
2015	12.00 (9.60 x 125%)	4.80 (3.84 x 125%)	0.870	4.176
2016	15.00 (12.00 x 125%)	6.00 (4.80 x 125%)	0.756	4.536
2017	16.50 (15.00 x 110%)	8.25* (50% of ₹ 16.50)	0.658	5.429
				14.141

*Payout Ratio changed to 50%.

After 2017, the perpetuity value assuming 10% constant annual growth is:

D_1= ₹ 8.25 × 110% = ₹ 9.075

Therefore P_o from the end of 2017

$$\frac{₹\,9.075}{0.15 - 0.10} = ₹\,181.50$$

This must be discounted back to the present value, using the 3 year discount factor after 15%.

	₹
Present Value of P_0 (₹ 181.50 × 0.658)	119.43
Add: PV of Dividends 2015 to 2017	14.14
Expected Market Price of Share	133.57

(b) P/E Ratio

$$\text{P/E Ratio} = \frac{\text{Expected Market Price of Share } (P_1)}{\text{EPS}}$$

$$= \frac{₹\,133.57}{₹\,9.60} = ₹\,13.91$$

Question 27

Rahim Enterprises is a manufacturer and exporter of woolen garments to European countries. Their business is expanding day by day and in the previous financial year the company has registered a 25% growth in export business. The company is in the process of considering a new investment project. It is an all equity financed company with 10,00,000 equity shares of face value of ₹ 50 per share. The current issue price of this share is ₹ 125 ex-divided. Annual earning are ₹ 25 per share and in the absence of new investments will remain constant in perpetuity. All earnings are distributed at present. A new investment is available which will cost ₹ 1,75,00,000 in one year's time and will produce annual cash inflows thereafter of ₹ 50,00,000. Analyse the effect of the new project on dividend payments and the share price.

Answer

(i) Let us first compute the Cost of Equity $k_e = \dfrac{D}{P} = \dfrac{25}{125} = 20\%$

(ii)   Current Earning = ₹ 25 x 10,00,000 = ₹ 2,50,00,000

The new project can be financed by retaining ₹ 1,75,00,000 of ₹ 2,50,00,000 earning next year, reducing dividend payment to ₹ 75,00,000 or

$$\frac{₹75,00,000}{10,00,000} = ₹\,7.50 \text{ per share}$$

(iii) In the following years, dividend will increase due to the cash generated by the new project. Dividend per share in year 2 shall be:

$$\frac{₹2,50,00,000 + ₹50,00,000}{10,00,000} = ₹\,30 \text{ per share}$$

(iv) The new share price can be calculated by finding the Present Value of the revised dividend payments:

$$P = \frac{₹7.50}{1.20} + \frac{₹30.00}{0.20} \times \frac{1}{1.20} = ₹\,131.25 \text{ per share}$$