

DIVIDEND DECISIONS

BASIC CONCEPTS AND FORMULAE

1. Introduction

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. The dividend policy of the company should aim at achieving the objective of the company to maximise shareholder's wealth.

2. Practical Considerations in Dividend Policy

The practical considerations in dividend policy of a company are as below:

- (a) Financial Needs of the Company;
- (b) Constraints on Paying Dividends- Such as legal, liquidity, access to capital market and investment opportunities;
- (c) Desire of Shareholders; and
- (d) Stability of Dividends.

3. Forms of Dividend

Dividends can be divided into the following forms:

- (i) Cash Dividend; and
- (ii) Stock Dividend.

4. Theories on Dividend Policies

- (a) **Traditional Position:** Expounded by Graham and Dodd, the stock market places considerably more weight on dividends than on retained earnings. Expressed quantitatively in the following valuation model:

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

If E is replaced by (D+R) then,

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

- (b) **Walter Approach:** Given by Prof. James E. Walter, the approach focuses on how dividends can be used to maximise the wealth position of equity holders.

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 retained profits

R_c = Cost of Capital

E = Earnings per share

D = Dividend per share.

- (c) **Gordon Growth Model:** This theory also contends that dividends are relevant. This model explicitly relates the market value of the firm to dividend policy. The relationship between dividend and share price on the basis of Gordon's formula is shown as:

$$V_E = \frac{\hat{e} d_0 (1+g)}{\hat{e} k_e - g}$$

Where,

V_E = Market price per share (ex-dividend)

d_0 = Current year dividend

g = Constant annual growth rate of dividends

K_e = Cost of equity capital (expected rate of return)

- (d) **Modigliani and Miller (MM) Hypothesis:** This hypothesis states that 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. MM Hypothesis is primarily 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:

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

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

Piyush Loonker and Associates presently pay a dividend of Re. 1.00 per share and has a share price of Rs. 20.00.

- (i) *If this dividend were expected to grow at a rate of 12% per annum forever, what is the firm's expected or required return on equity using a dividend-discount model approach?*
- (ii) *Instead of this situation in part (i), suppose that the dividends were expected to grow at a rate of 20% per annum for 5 years and 10% per year thereafter. Now what is the firm's expected, or required, return on equity?*

Answer

- (i) **Firm's Expected or Required Return On Equity**

(Using a dividend discount model approach)

According to Dividend discount model approach the firm's expected or required return on equity is computed as follows:

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

Where,

K_e = Cost of equity share capital or (Firm's expected or required return on 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.

Now, $D_1 = D_0 (1 + g)$ or Rs. 1 (1 + 0.12) or Rs. 1.12, $P_0 =$ Rs. 20 and $g = 12\%$ per annum

$$\text{Therefore, } K_e = \frac{\text{Rs. 1.12}}{\text{Rs. 20}} + 12\%$$

Or, $K_e = 17.6\%$

- (ii) **Firm's Expected or Required Return on Equity**

(If dividends were expected to grow at a rate of 20% per annum for 5 years and 10% per year thereafter)

Since in this situation if dividends are expected to grow at a super normal growth rate g_s , for n years and thereafter, at a normal, perpetual growth rate of g_n beginning in the year $n + 1$, then the cost of equity can be determined by using the following formula:

$$P_0 = \sum_{t=1}^{S^n} \frac{\text{Div}_0 (1+g_s)^t}{(1+K_e)^t} + \frac{\text{Div}_{n+1}}{K_e - g_n} \cdot \frac{1}{(1+K_e)^n}$$

Where,

g_s = Rate of growth in earlier years.

g_n = Rate of constant growth in later years.

P_0 = Discounted value of dividend stream.

K_e = Firm's expected, required return on equity (cost of equity capital).

Now,

$g_s = 20\%$ for 5 years, $g_n = 10\%$

Therefore,

$$P_0 = \sum_{t=1}^{S^5} \frac{D_0 (1+0.20)^t}{(1+K_e)^t} + \frac{\text{Div}_{5+1}}{K_e - 0.10} \cdot \frac{1}{(1+K_e)^5}$$

$$P_0 = \frac{1.20}{(1+K_e)^1} + \frac{1.44}{(1+K_e)^2} + \frac{1.73}{(1+K_e)^3} + \frac{2.07}{(1+K_e)^4} + \frac{2.49}{(1+K_e)^5} + \frac{2.49(1+0.10)}{K_e - 0.10} \cdot \frac{1}{(1+K_e)^5}$$

$$\text{or } P_0 = \text{Rs. } 1.20 (\text{PVF}_1, K_e) + \text{Rs. } 1.44 (\text{PVF}_2, K_e) + \text{Rs. } 1.73 (\text{PVF}_3, K_e) + \text{Rs. } 2.07 (\text{PVF}_4, K_e) + \text{Rs. } 2.49 (\text{PVF}_5, K_e) + \frac{\text{Rs. } 2.74 (\text{PVF}_5, K_e)}{K_e - 0.10}$$

By trial and error we are required to find out K_e

Now, assume $K_e = 18\%$ then we will have

$$\begin{aligned} P_0 &= \text{Rs. } 1.20 (0.8475) + \text{Rs. } 1.44 (0.7182) + \text{Rs. } 1.73 (0.6086) + \text{Rs. } 2.07 (0.51589) \\ &+ \text{Rs. } 2.49 (0.43710) + \text{Rs. } 2.74 (0.4371) \cdot \frac{1}{0.18 - 0.10} \\ &= \text{Rs. } 1.017 + \text{Rs. } 1.034 + \text{Rs. } 1.052 + \text{Rs. } 1.067 + \text{Rs. } 1.09 + \text{Rs. } 14.97 \\ &= \text{Rs. } 20.23 \end{aligned}$$

Since the present value of dividend stream is more than required it indicates that K_e is greater than 18%.

Now, assume $K_e = 19\%$ we will have

$$\begin{aligned}P_0 &= \text{Rs. } 1.20 (0.8403) + \text{Rs. } 1.44 (0.7061) + \text{Rs. } 1.73 (0.5934) + \text{Rs. } 2.07 (0.4986) \\&\quad + \text{Rs. } 2.49 (0.4190) + \text{Rs. } 2.74 (0.4190) \times \frac{1}{0.19 - 0.10} \\&= \text{Rs. } 1.008 + \text{Rs. } 1.016 + \text{Rs. } 1.026 + \text{Rs. } 1.032 + \text{Rs. } 1.043 + \text{Rs. } 12.76 \\&= \text{Rs. } 17.89\end{aligned}$$

Since the market price of share (expected value of dividend stream) is Rs. 20. Therefore, the discount rate is closer to 18% than it is to 19%, we can get the exact rate by interpolation by using the following formula:

$$K_e = \frac{r - (PV_s - PV_D)}{DPV} \times Dr$$

Where,

r = Either of two interest rates

PV_s = Present value of share

PV_D = Present value of dividend stream

Dr = Difference in value of dividend stream

DPV = Difference in calculated present value of dividend stream.

$$\begin{aligned}K_e &= \frac{18\% - (\text{Rs. } 20 - \text{Rs. } 20.23)}{\text{Rs. } 20.23 - \text{Rs. } 17.89} \times 0.01 \\&= \frac{18\% - (-\text{Rs. } 0.23)}{\text{Rs. } 2.34} \times 0.01 \\&= \frac{18\% + (\text{Rs. } 0.23)}{\text{Rs. } 2.34} \times 0.01 \\&= 18\% + 0.10\% \\&= 18.10\%\end{aligned}$$

Therefore, the firm's expected, or required, return on equity is 18.10%. At this rate the present discounted value of dividend stream is equal to the market price of the share.

Question 6

Sahu & Co. earns Rs. 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

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

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

$$\text{Market value of the share } P = \frac{1.80 + \frac{.20}{.10}(6 - 1.80)}{.10}$$

$$P = \frac{1.80 + 8.40}{.10}$$
$$p = \frac{1.80 + \frac{.20}{.10}(4.20)}{.10}$$

$$P = \text{Rs. } 102$$

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 7

X Ltd., has 8 lakhs equity shares outstanding at the beginning of the year 2003. The current market price per share is Rs. 120. The Board of Directors of the company is contemplating Rs. 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 Rs. 3.20 crores by the end of the year assuming net income for the year will be Rs. 1.60 crores?*

Answer

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

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

Where,

P_0 = Existing market price per share i.e. Rs. 120

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

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

K_e = Capitalisation rate i.e. 9.6%.

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

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

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

$$120 \times 1.096 = P_1 + 6.4$$

$$P_1 = 120 \times 1.096 - 6.4$$

$$= 125.12$$

(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:

Particulars	(Rs. in lakhs)	
	If dividend declared	If dividend not declared
Net Income	160	160
Less: Dividend paid	<u>51.20</u>	—

Strategic Financial Management

Retained earnings	108.80	160
Investment budget	<u>320</u>	<u>320</u>
Amount to be raised by issue of new shares (i)	<u>211.20</u>	<u>160</u>
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 8

Capital structure of Sun Ltd., as at 31.3.2003 was as under:

	<i>(Rs. in lakhs)</i>
Equity share capital	80
8% Preference share capital	40
12% Debentures	64
Reserves	32

Sun Ltd., earns a profit of Rs. 32 lakhs annually on an average before deduction of income-tax, which works out to 35%, and interest on debentures.

Normal return on equity shares of companies similarly placed is 9.6% provided:

- (a) Profit after tax covers fixed interest and fixed dividends at least 3 times.*
- (b) Capital gearing ratio is 0.75.*
- (c) Yield on share is calculated at 50% of profits distributed and at 5% on undistributed profits.*

Sun Ltd., has been regularly paying equity dividend of 8%.

Compute the value per equity share of the company.

Answer

Calculation of Profit after tax (PAT)

	Rs.
Profit before interest and tax (PBIT)	32,00,000
Less: Debenture interest (Rs. 64,00,000 × 12/100)	<u>7,68,000</u>
Profit before tax (PBT)	24,32,000
Less: Tax @ 35%	<u>8,51,200</u>

Profit after tax (PAT)		15,80,800
Less: Preference Dividend		
(Rs. 40,00,000 × 8/100)	3,20,000	
Equity Dividend (Rs. 80,00,000 × 8/100)	<u>6,40,000</u>	<u>9,60,000</u>
Retained earnings (Undistributed profit)		6,20,800

Calculation of Interest and Fixed Dividend Coverage

$$= \frac{\text{PAT} + \text{Debenture interest}}{\text{Debenture interest} + \text{Preference dividend}}$$

$$= \frac{15,80,800 + 7,68,000}{7,68,000 + 3,20,000} = \frac{23,48,800}{10,88,000} = 2.16 \text{ times}$$

Calculation of Capital Gearing Ratio

$$\text{Capital Gearing Ratio} = \frac{\text{Fixed interest bearing funds}}{\text{Equity shareholders' funds}}$$

$$= \frac{\text{Preference Share Capital} + \text{Debentures}}{\text{Equity Share Capital} + \text{Reserves}}$$

$$= \frac{40,00,000 + 64,00,000}{80,00,000 + 32,00,000} = \frac{1,04,00,000}{1,12,00,000}$$

$$= 0.93$$

Calculation of Yield on Equity Shares:

Yield on equity shares is calculated at 50% of profits distributed and 5% on undistributed profits:

	(Rs.)
50% on distributed profits (Rs. 6,40,000 × 50/100)	3,20,000
5% on undistributed profits (Rs. 6,20,800 × 5/100)	<u>31,040</u>
Yield on equity shares	<u>3,51,040</u>

$$\text{Yield on equity shares \%} = \frac{\text{Yield on shares}}{\text{Equity share capital}} \times 100$$

$$= \frac{3,51,040}{80,00,000} \times 100 = 4.39\% \text{ or, } 4.388\%.$$

Calculation of Expected Yield on Equity shares

Note: There is a scope for assumptions regarding the rates (in terms of percentage for every one time of difference between Sun Ltd. and Industry Average) of risk premium involved with respect to Interest and Fixed Dividend Coverage and Capital Gearing Ratio. The below solution has been worked out by assuming the risk premium as:

- (i) 1% for every one time of difference for Interest and Fixed Dividend Coverage.
- (ii) 2% for every one time of difference for Capital Gearing Ratio.
- (i) Interest and fixed dividend coverage of Sun Ltd. is 2.16 times but the industry average is 3 times. Therefore, risk premium is added to Sun Ltd. Shares @ 1% for every 1 time of difference.
- $$\begin{aligned}\text{Risk Premium} &= 3.00 - 2.16 (1\%) \\ &= 0.84 (1\%) = 0.84\%\end{aligned}$$
- (ii) Capital Gearing ratio of Sun Ltd. is 0.93 but the industry average is 0.75 times. Therefore, risk premium is added to Sun Ltd. shares @ 2% for every 1 time of difference.
- $$\begin{aligned}\text{Risk Premium} &= 0.75 - 0.93 (2\%) \\ &= 0.18 (2\%) \\ &= 0.36\%\end{aligned}$$

	(%)
Normal return expected	9.60
Add: Risk premium for low interest and fixed dividend coverage	0.84
Add: Risk premium for high interest gearing ratio	<u>0.36</u>
	<u>10.80</u>

Value of Equity Share

$$\begin{aligned}&= \frac{\text{Actual yield}}{\text{Expected yield}} \times \text{Paid-up value of share} \\ &= \frac{4.39}{10.80} \times 100 = \text{Rs. } 40.65\end{aligned}$$

Question 9

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 Rs. 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:

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

Price estimate after budget announcement:

$$P_0 = \frac{1.80 \times (1.05)}{(.07-.05)} = \text{Rs. } 94.50$$

Question 10

A Company pays a dividend of Rs. 2.00 per share with a growth rate of 7%. The risk free rate is 9% and the market rate of return is 13%. The Company has a beta factor of 1.50. However, due to a decision of the Finance Manager, beta is likely to increase to 1.75. Find out the present as well as the likely value of the share after the decision.

Answer

In order to find out the value of a share with constant growth model, the value of K_e should be ascertained with the help of 'CAPM' model as follows:

$$K_e = R_f + b (K_m - R_f)$$

Where,

K_e = Cost of equity

R_f = Risk free rate of return

b = Portfolio Beta i.e. market sensitivity index

K_m = Expected return on market portfolio

By substituting the figures, we get

$$\begin{aligned} K_e &= 0.09 + 1.5 (0.13 - 0.09) \\ &= 0.15 \text{ or } 15\% \end{aligned}$$

and the value of the share as per constant growth model is

$$P_0 = \frac{D_1}{(k_e - g)}$$

Where,

P_0 = Price of a share

D_1 = Dividend at the end of the year 1

K_e = Cost of equity

G = growth

$$P_0 = \frac{2.00}{(k_e - g)}$$

$$P_0 = \frac{2.00}{0.15 - 0.07}$$

$$= \text{Rs. } 25.0$$

However, if the decision of finance manager is implemented, the beta (b) factor is likely to increase to 1.75 therefore, K_e would be

$$\begin{aligned} K_e &= R_f + b (K_m - R_f) \\ &= 0.09 + 1.75 (0.13 - 0.09) \\ &= 0.16 \text{ or } 16\% \end{aligned}$$

The value of share is

$$P_0 = \frac{D_1}{(k_e - g)}$$

$$P_0 = \frac{2.00}{0.16 - 0.07}$$

$$= \text{Rs. } 22.22$$

Question 11

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

	Rs.
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 Rs. 42 by using Walter model?

Answer

	Rs. in lakhs
Net Profit	30
Less: Preference dividend	12
Earning for equity shareholders	18
Therefore earning per share	18/3 = Rs. 6.00
Cost of capital i.e. (K_e)	
(Assumed)	16%

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

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

Here $D = 6x$; $E = \text{Rs. } 6$; $r = 0.20$ and $K_e = 0.16$ and $P = \text{Rs. } 42$

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

$$\text{Or, Rs. } 42 = 37.50X + 46.875 (1 - x)$$

$$= 9.375x = 4.875$$

$$x = 0.52$$

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

Question 12

The following information pertains to M/s XY Ltd.

Earnings of the Company	Rs.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 X Y 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 = Rs.5
D	=	Dividend per share = Rs.3
r	=	Return earned on investment = 15%
K _e	=	Cost of equity capital = 12%

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

$$= \text{Rs.}52.08$$

- (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:

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

Question 13

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

When dividends are paid

$$100 = (5 + P_1) / (1 + 0.10)$$

Therefore, $P_1 = \text{Rs.} 105/-$.

Value of firm

$$= \text{Rs.} ([50,000/- + 7,50,000/- / 105/-] \times 105/-) - 10,00,000/- + 5,00,000/- / 1.10$$

$$= \text{Rs.} (60,00,000/- - 5,00,000/-) / 1.10$$

$$= \text{Rs.} 50,00,000/-$$

When dividend is not paid

$$100 = 1 / 1.1 \times P_1$$

Therefore, $P_1 = \text{Rs.} 110/-$.

Value of firm

$$= \text{Rs.} ([50,000/- + (5,00,000/- / 110/-) \times 110/-] - 10,00,000/- + 5,00,000/-) / 1.10$$

$$= \text{Rs.} (60,00,000/- - 5,00,000/-) / 1.10$$

$$= \text{Rs.} 50,00,000/-$$

M.M. Approach indicates that the value of the firm in both the situations will be the same.

Question 14

The following information is supplied to you:

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

- (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?

Answer

- (i) The EPS of the firm is Rs.10 (i.e., Rs.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 Rs.1,50,000 among 20,000 shares, giving a dividend per share of Rs.7.50. The value of the share as per Walter's model may be found as follows:

$$\begin{aligned} P &= \frac{D}{K_e} + \frac{(r/K_e)(E - D)}{K_e} \\ &= \frac{7.50}{.08} + \frac{(.10/.08)(10 - 7.5)}{.08} \\ &= \text{Rs.132.81} \end{aligned}$$

The firm has a dividend payout of 75% (i.e., Rs.1,50,000) out of total earnings of Rs.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

$$\begin{aligned} P &= \frac{D}{k_e} + \frac{(r/K_e)(E - D)}{K_e} \\ &= \frac{0}{.08} + \frac{(.10/.80)(10 - 0)}{.08} \\ &= \text{Rs.156.25} \end{aligned}$$

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

- (ii) The P/E ratio at which the dividend policy will have no effect on the value of the share is such at which the k_e would be equal to the rate of return, r , of the firm. The K_e would be 10% ($=r$) at the P/E ratio of 10. Therefore, at the P/E ratio of 10, the dividend policy would have no effect on the value of the share.
- (iii) If the P/E is 8 instead of 12.5, then the k_e which is the inverse of P/E ratio, would be 12.5 and in such a situation $k_e > r$ and the market price, as per Walter's model would be

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

= Rs.76

Question 15

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 Rs. 100. It expects a net profit of Rs. 2,50,000 for the year and the Board is considering dividend of Rs. 5 per share.

M Ltd. requires to raise Rs. 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

$$100 = \frac{1}{1.10}(\text{Rs.}5 + P_1)$$

$$110 = \text{Rs.}5 + P_1$$

$$P_1 = 105$$

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

$$\text{Rs.}5,00,000 - (2,50,000 - 1,25,000)$$

$$\text{Rs.}5,00,000 - 1,25,000 = \text{Rs.}3,75,000$$

- (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) × Rs.105 = Rs.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
Rs.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) × Rs.110
= Rs.30,00,030

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

Question 16

T Ltd. has promoted an open-ended equity oriented scheme in 1999 with two plans – Dividend Reinvestment Plan (Plan-A) and a Bonus Plan (Plan-B); the face value of the units was Rs.10 each. X and Y invested Rs.5,00,000 each on 1.4.2001 respectively in Plan-A and Plan-B, when the NAV was Rs.42.18 for Plan A and Rs.35.02 for Plan-B, X and Y both redeemed their units on 31.3.2008. Particulars of dividend and bonus declared on the units over the period were as follows:

Date	Dividend	Bonus	NAV	
		Ratio	Plan A	Plan B
15.9.2001	15	-	46.45	29.10
28.7.2002	-	1 : 6	42.18	30.05
31.3.2003	20	-	48.10	34.95
31.10.2003	-	1 : 8	49.60	36.00

Dividend Decisions

15.3.2004	18	-	52.05	37.00
24.3.2005	-	1 : 11	53.05	38.10
27.3.2006	16	-	54.10	38.40
28.2.2007	12	1 : 12	55.20	39.10
31.3.2008	-	-	50.10	34.10

You are required to calculate the annual return for X and Y after taking into consideration the following information :

- (i) Securities transaction tax @ 2% on redemption.
- (ii) Liability of capital gains to income tax
 - (a) Long-term capital gain-exempt; and
 - (b) Short-term capital gains at 10% plus education cess at 3%.

Answer

X: Plan A

$$\text{Unit acquired} = \frac{500,000}{42.18} = 11,854$$

Date	Units held	Dividend %	Dividend Amount	Reinvestment Rate	New Units	Total Units
01.04.00						11,854
15.09.01	11,854	15	17,781	46.45	383	12,237
31.03.03	12,237	20	24,474	48.10	509	12,746
15.03.04	12,746	18	22,943	52.05	441	13,187
27.03.06	13,187	16	21,099	54.10	390	13,577
28.02.07	13,577	12	16,292	55.20	295	13,872
31.03.08	Redemption 13,872 × 50.10				Rs.	694,987
	Less: STT 0.2 %					<u>1,390</u>
						693,597
	Less: Short-term capital gains					<u>-</u>
	Net proceeds					693,597

Strategic Financial Management

	Less: Cost of acquisition		<u>500,000</u>
	Total Gain	Rs.	<u>193,597</u>
CVAF			
	r, 8		6.936
Annual Return			27.67%
$\frac{\text{Y : Plan B}}{\text{Units acquired}} = \frac{500,000}{35.02} = 14,278$			
Date	Units held	Bonus Ratio	Total Units
01.04.00			14,278
28.07.02	14,278	1 : 6	16,658
31.10.03	16,658	1 : 8	18,740
24.03.05	18,740	1 : 11	20,444
28.02.07	20,444	1 : 12	22,148
31.03.08	Redemption 22,148 × 34.10		Rs. 755,247
	Less: STT 0.2 %		<u>1,510</u>
			753,737
	Less: Short-term capital gains		<u>-</u>
	Net proceeds		753,737
	Less: Cost of acquisition		<u>500,000</u>
	Total Gain	Rs.	<u>253,737</u>
CVAF r, 8			7.5374
Annual Return			29.29 %

EXERCISES

Question 1

CMC plc has an all-common-equity capital structure and has 200,000 shares of £2 par value equity shares outstanding. When CMC's founder, who was also its research director and most successful inventor, retired unexpectedly to the South Pacific in late 2009, CMC was left suddenly and permanently with materially lower growth expectations and

relatively few attractive new investment opportunities. Unfortunately, there was no way to replace the founder's contributions to the firm. Previously, CMC found it necessary to plough back most of its earnings to finance growth, which averaged 12% per year. Future growth at a 5% rate is considered realistic; but that level would call for an increase in the dividend payout. Further, it now appears that new investment projects with at least the 14 % rate of return required by CMC's shareholders ($k_e = 14\%$) would amount to only £800,000 for 2010 in comparison to a projected £2,000,000 of net income. If the existing 20% dividend payout were continued, retained earnings would be £16,00,000 in 2010, but, as noted, investments that yield the 14 % cost of capital would amount to only £800,000.

The one encouraging thing is that the high earnings from existing assets are expected to continue, and net income of £20,00,000 is still expected for 2010. Given the dramatically changed circumstances, CMC's board is reviewing the firm's dividend policy.

- (a) Assuming that the acceptable 2010 investment projects would be financed entirely by earnings retained during the year, calculate DPS in 2010, assuming that CMC uses the residual payment policy.
- (b) What payout ratio does your answer to part (a) imply for 2010?
- (c) If a 60% payout ratio is adopted and maintained for the foreseeable future, what is your estimate of the present market price of the equity share? How does this compare with the market price that should have prevailed under the assumptions existing just before the news about the founder's retirement? If the two values of P_0 are different. Comment on why?
- (d) What would happen to the price of the share if the old 20% payout were continued? Assume that if this payout is maintained, the average rate of return on the retained earnings will fall to 7.5% and the new growth rate will be

$$\begin{aligned} G &= (1.0 - \text{Payout ratio}) \times (\text{ROE}) \\ &= (1.0 - 0.2) (7.5\%) = (0.8) (7.5\%) = 6.0\% \end{aligned}$$

(Answer: (a) $\text{DPS} = £6 = D_1$ (b) 60% (c) £ 66.67 (d) If the payout ratio were continued at 20%, even after internal investment opportunities had declined, the price of the stock would drop to £25 rather than to £66.67.)

Question 2

Zumo & Co. is a watch manufacturing company and is all equity financed and has paid up capital Rs.10,00,000 (Rs.10 per shares)

Strategic Financial Management

The other data related to the company is as follows:

Year	EPS (Rs.)	Net Dividend per share (Rs.)	Share Price (Rs.)
2004	4.20	1.70	25.20
2005	4.60	1.80	18.40
2006	5.10	2.00	25.50
2007	5.50	2.20	27.50
2008	6.20	2.50	37.20

Zumo & Co. has hired one management consultant, Vidal Consultants to analyze the future earnings and other related item for the forthcoming years.

As per Vidal Consultant's report

- (1) The earnings and dividend will grow at 25% for the next two years.
- (2) Earnings are likely at rate of 10% from 3rd year and onwards.
- (3) Further if there is reduction in earnings growth occurs dividend payout ratio will increase to 50%

Assuming the tax rate as 33% (not expected to change in the foreseeable future) calculate the estimated share price and P/E Ratio which analysts now expect for Zumo & Co., using the dividend valuation model.

You may further assume that post tax cost of capital is 18%.

(Answer: Expected Market Price of Share Rs. 53.34 and PE Ratio= 8.6)

Question 3

Truly Plc presently pay a dividend of £ 1.00 per share and has a share price of £ . 20.00.

- (i) If this dividend were expected to grow at a rate of 12% per annum forever, what is the firm's expected or required return on equity using a dividend-discount model approach?
- (ii) Instead of this situation in part (i), suppose that the dividends were expected to grow at a rate of 20% per annum for 5 years and 10% per year thereafter. Now what is the firm's expected, or required, return on equity?

(Answer: (i) $K_e = 17.6\%$ (ii) $K_e = 18.10\%$)