

Problem 5

The following information is available in respect of a firm :

Capitalisation rate (K_e) = 0.10

Earnings per share (E) = ₹10

Assumed rate of return on investments (r) : (i) 15%, (ii) 10% and (iii) 8%.

Show the effect of dividend policy on the market price of shares, using Walter's model.
Dividend Pay-out ratio (D/P Ratio) : 0%, 25%, 50%, 75% and 100%.

Also state the optimum dividend pay-out ratio.



Solution :

According to Walter's Model, market price of a share, P is given by.

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

Where,

D = Dividend per share,

r = Rate of return on investment,

K_e = Capitalisation rate,

E = Earnings per share.

Situation 1 :

When $r = 15\%$ or 0.15 and $K_e = 0.10$

(i.e., $r > K_e \Rightarrow$ Growth Firm)

Value of Shares (Walter's Model) at different D/P Ratio :

D/P ratio = 0%

(i.e., Dividend per Share = zero)

$$P = \frac{0 + \frac{0.15}{0.10}(\text{₹}10 - 0)}{0.10}$$

$$= \text{₹} 150$$

D/P ratio = 25%

(i.e., Dividend per Share = ₹ 2.50)

$$P = \frac{\text{₹}2.50 + \frac{0.15}{0.10}(\text{₹}10 - \text{₹}2.50)}{0.10}$$

$$= \text{₹} 137.50$$

D/P ratio = 50%

(i.e., Dividend per Share = ₹ 5)

$$P = \frac{\text{₹}5 + \frac{0.15}{0.10}(\text{₹}10 - \text{₹}5)}{0.10}$$

$$= \text{₹} 125$$

D/P ratio = 75%

(i.e., Dividend per Share = ₹ 7.50)

$$P = \frac{\text{₹}7.50 + \frac{0.15}{0.10}(\text{₹}10 - \text{₹}7.50)}{0.10}$$

$$= \text{₹} 112.50$$

D/P ratio = 100%

(i.e., Dividend per Share = ₹10)

$$P = \frac{\text{₹}10 + \frac{0.15}{0.10}(\text{₹}10 - \text{₹}10)}{0.10}$$

$$= \text{₹} 100$$

► Interpretation :

From the above calculation, it is quite clear that the value of shares (P) is inversely related to the D/P ratio. As the pay-out ratio increases, the market value of shares declines. This is so, because the firm is a growth firm (where $r > K_e$) and is able to earn a return on investments (r) exceeding the required rate of return (K_e). The market value of shares (₹ 150) is highest when D/P ratio is zero, i.e. the firm retains its entire earnings. When all earnings are distributed, i.e. D/P ratio is 100%, then its market value shows the lowest price (₹ 100).

Situation 2 :

When $r = 10\%$ or 0.10 and $K_e = 0.10$

(i.e., $r = K_e \Rightarrow$ Normal firm).

Value of shares (Walter's Model) at different D/P Ratio :

D/P ratio = 0%

(Dividend per Share = zero)

$$P = \frac{0 + \frac{0.10}{0.10} (\text{₹}10 - 0)}{0.10}$$
$$= \text{₹} 100$$

D/P ratio = 25%

(Dividend per Share = ₹ 2.50)

$$P = \frac{\text{₹}2.50 + \frac{0.10}{0.10} (\text{₹}10 - \text{₹}2.50)}{0.10}$$
$$= \text{₹} 100$$

D/P ratio = 50%

(i.e., Dividend per Share = ₹ 5)

$$P = \frac{\text{₹}5 + \frac{0.10}{0.10} (\text{₹}10 - \text{₹}5)}{0.10}$$
$$= \text{₹} 100$$

D/P ratio = 75%

(Dividend per Share = ₹ 7.50)

$$P = \frac{\text{₹}7.50 + \frac{0.10}{0.10} (\text{₹}10 - \text{₹}7.50)}{0.10}$$
$$= \text{₹} 100$$

D/P ratio = 100%

(Dividend per Share = ₹ 10)

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

Interpretation :

Under this situation, when $r = K_e$, the market value of shares is constant irrespective of the D/P ratio. It is a matter of indifference whether the firm retains whole of the profits or distribute dividends. There is no optimum dividend policy. But this is a hypothetical situation; r and K_e cannot be the same. Moreover, Walter concludes that dividend policy does matter as a variable in maximising firm value.

Situation 3 :

When $r = 8\%$ or 0.08 and $K_e = 0.10$

(i.e., $r < K_e \Rightarrow$ Declining Firm)

Value of shares (Walter's Model) at different D/P Ratio :

D/P ratio = 0%

(Dividend per Share = zero)

$$P = \frac{0 + \frac{0.08}{0.10} (\text{₹}10 - 0)}{0.10}$$
$$= \text{₹} 80$$

D/P ratio = 25%

(Dividend per Share = ₹ 2.50)

$$P = \frac{\text{₹}2.50 + \frac{0.08}{0.10} (\text{₹}10 - \text{₹}2.50)}{0.10}$$
$$= \text{₹} 85$$

$$\text{D/P ratio} = 50\%$$

(i.e., Dividend per Share = ₹ 5)

$$P = \frac{\text{₹}5 + \frac{0.08}{0.10}(\text{₹}10 - \text{₹}5)}{0.10}$$
$$= \text{₹} 90$$

$$\text{D/P ratio} = 100\%$$

(Dividend per Share = ₹ 10)

$$P = \frac{\text{₹}10 + \frac{0.08}{0.10}(\text{₹}10 - \text{₹}10)}{0.10}$$
$$= \text{₹} 100$$

$$\text{D/P ratio} = 75\%$$

(Dividend per Share = ₹ 7.50)

$$P = \frac{\text{₹}7.50 + \frac{0.08}{0.10}(\text{₹}10 - \text{₹}7.50)}{0.10}$$
$$= \text{₹} 95$$

► Interpretation :

When the firm is a declining firm, where $r < K_e$, D/P ratio and the value of share are correlated positively. That is, when pay-out ratio increases, the market value of shares also increases and vice versa. The market value of share is maximum (₹ 100) when D/P ratio is 100%. So, under this situation, it is advisable to distribute the entire earnings as dividend to the shareholders.

Therefore, the optimum D/P Ratio is 100%.

Problem 5

The following information is supplied to you, about LK Ltd. :

Earnings of the company

₹ 15,00,000

Dividends paid

₹ 5,00,000

Number of issued shares

1,00,000

Price earnings ratio

10

Rate of return on investment (%)

15

- (i) Determine the theoretical market price of the share as per Walter's Model.
(ii) Are you satisfied with the current dividend policy of the firm? If not, what should be the optimal dividend payout ratio in this case? Find out the price of the share at that dividend payout ratio.

Solution

Calculation of theoretical Market Price :

Earnings per share (₹ 15,00,000 ÷ 1,00,000)

₹ 15

Dividend per share (₹ 5,00,000 ÷ 1,00,000)

₹ 5

$k_e = (1 + PE) = (1 + 10)$

0.10

Rate of Return (r)

0.15

$$P_0 = \frac{D}{k_e} + \frac{\frac{r}{k_e}(E - D)}{k_e} = \frac{₹ 5}{0.10} + \frac{0.15(15 - 5)}{0.10} = ₹ 200$$

As the rate of return of the firm is 15% and Equity Capitalization Rate is only 10%, the company is not following an optional dividend policy. In such situation, the market price of the share would be :

$$P_0 = \frac{D}{k_e} + \frac{\frac{r}{k_e}(E - D)}{k_e} = \frac{0}{0.10} + \frac{\frac{0.15}{0.10}(15 - 0)}{0.10} = ₹ 225$$