

**3. Earning Price Ratio and Dividend Growth Model :** At the time of determining the cost of equity share capital under earning price ratio method, it is assumed that the dividend payout ratio of the company is 100% i.e., the entire earnings of the company is distributed among the shareholders. As a result of it, no part of the earnings remain undistributed i.e., the retention ratio is zero. But, sometimes it may be given in the problem that the dividend payout ratio is less than 100%, and if so, the amount of retained earnings must be given. In such a case, it is to be decided whether the retained earning yields the equal amount of the expected earnings to the shareholders or not.

- (i) If there is no retained earning or the retained earning yields equal to the expected earning of the shareholders, then—

$$K_e = \frac{E(1+g)}{P}$$

where, —

$K_e$  = Cost of equity share capital ;

$E$  = Earning per share ;

$P$  = Net selling price of each share, and

$g$  = Growth rate of Dividend.

- (ii) If the retained earning does not yield equal to the expected earning of the shareholders, then—

$$K_e = \frac{D}{P} + g$$

where, —

$E$  = Earning per share ;

$P$  = Net selling price of each share ;

$D$  = Dividend per share =  $E \times$  dividend payout ratio ; and

$g$  = Growth rate of Dividend = Retention ratio  $\times$  Rate of return on retained earning.

#### PROBLEM 1

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Financial Management

□ Example 1 : (a) The share capital of Servex Ltd. consists of 10,000 Equity Shares of ₹ 100 each. The company has earned ₹ 1,50,000 during the current financial year. Now the company wants to issue 2,000 new Equity Shares. If the growth rate of Dividend is 5% and floatation cost is 10%, find out the cost of Equity Share Capital of that company.

The company is divided into 10,000 Equity Shares of ₹ 100 each. The

• **Solution**  $\Rightarrow$

Let Earning per share = E, Net Selling Price of each share = P and Growth rate of Dividend = g.

$$\therefore E = ₹ \frac{1,50,000}{10,000} = ₹ 15$$

$$P = ₹ \{100 - (100 \times \frac{10}{100})\} = ₹ (100 - 10) = ₹ 90.$$

$$g = 5\% \text{ or, } 0.05.$$

Now, if ' $K_e$ ' be the cost of Equity Share Capital, then—

$$\begin{aligned} K_e &= \frac{E(1+g)}{P} \\ &= \frac{15(1+0.05)}{90} \\ &= \frac{15 \times 1.05}{90} = 0.175 \text{ or, } 17.5\%. \end{aligned}$$

Hence, required cost of Equity Share Capital is 17.5%.

**PROBLEM 2**

The share capital of Jindal limited is divided into 10000 equity shares of Rs. 100 each. The current market price of each share is Rs. 80. The company has earned Rs. 100000 during the current financial year. If the dividend pay out ratio is 60% and the rate of return on retained earning is 15%, determine the cost of Equity share capital of that company.

(b) Let, Dividend per share = D, Earning per share = E, Net Selling Price of each share = P and Growth rate of Dividend = g.

$$\therefore E = ₹ \frac{1,00,000}{10,000} = ₹ 10$$

$$D = \text{Earning per share} \times \text{Dividend Payout Ratio}$$

$$= ₹ 10 \times \frac{60}{100} = ₹ 6.$$

$$P = ₹ 80.$$

$$g = \text{Retention Ratio} \times \text{Rate of return on retained earning}$$

$$= 40\% \times 15\% = 0.06.$$

Now, if ' $K_e$ ' be the cost of Equity Share Capital, then—

$$\begin{aligned} K_e &= \frac{D}{P} + g \\ &= \frac{6}{80} + 0.06 \\ &= 0.075 + 0.06 = 0.135 \text{ or, } 13.5\%. \end{aligned}$$

Hence, required cost of Equity Share Capital is 13.5%.

### 6.1. Capital Assets Pricing Model, CAPM

The capital assets pricing model has been developed by Sharpe and Lintner in the year 1960. The expected rate of return to the investor can be determined with the help of this model. Again, the cost of capital (K) is the expected rate of return to the investors. So, the cost of equity share capital can be determined with the help of this model. According to the Capital Assets pricing model, —

$$R_s = R_f + \beta (R_m - R_f), \text{ where —}$$

$R_s$  = Expected rate of return to the investors, or Cost of Capital ;

$R_f$  = Riskfree rate of return ;

$R_m$  = Market rate of return ;

$\beta$  = Beta coefficient by which the market risk is determined

here  $\beta = \frac{\text{Cov}(S_m)}{\sigma_m^2}$ , where —

$$\text{Cov}(S_m) = \frac{1}{n} \sum (R_s - \bar{R}_s)(R_m - \bar{R}_m) ;$$

$$\bar{R}_s = \frac{\sum R_s}{n} = \text{Average rate of expected return ;}$$

$$\bar{R}_m = \frac{\sum R_m}{n} = \text{Average rate of market return ; and}$$

$$\sigma_m^2 = \frac{1}{n} \sum (R_m - \bar{R}_m)^2 .$$

**Significance of  $\beta$  :**

- (i) If  $\beta = 1$  of a share, then the share is called Neutral Share. The meaning of  $\beta = 1$  is that the price of the share will be changed at the same rate as market index changes.
- (ii) If  $\beta > 1$  of a share, then the share is called Aggressive share. If  $\beta > 1$  of a share, the price of the share changes at higher rate than that of the changes in market index. Such type of share is also called Risky Share.
- (iii) If  $\beta < 1$  of a share, then the share is called Defensive Share. If  $\beta < 1$  of a share, the price of the share changes at low rate than that of the changes in market index. Such type of share is also called Less Risky Share.
- (iv) If  $\beta = 0$  of a share, then the share is called Riskfree share.

□ **Example 1 :** If the riskfree rate of return and the market rate of return of an investment are 12% and 16% respectively, calculate the cost of Equity Share Capital if (i)  $\beta = 1$  ; (ii)  $\beta = \frac{1}{4}$ , and (iii)  $\beta = \frac{3}{2}$ .

• **Solution** ⇒

Let  $R_f$  = Riskfree rate of return and  $R_m$  = Market rate of return.

∴  $R_f = 12\%$  and  $R_m = 16\%$ .

Now, we know that,—

$$R_s = R_f + \beta (R_m - R_f) \dots\dots\dots (i)$$

where,  $R_s$  = Cost of Equity Share.

(i) If  $\beta = 1$ , we get from (i)—

$$\begin{aligned} R_s &= 12\% + 1 (16\% - 12\%) \\ &= 12\% + 4\% \\ &= 16\%. \end{aligned}$$

(ii) If  $\beta = \frac{1}{4}$ , we get from (i),—

$$\begin{aligned} R_s &= 12\% + \frac{1}{4} (16\% - 12\%) \\ &= 12\% + 1\% = 13\%. \end{aligned}$$

(iii) If  $\beta = \frac{3}{2}$ , we get from (i),—

$$\begin{aligned} R_s &= 12\% + \frac{3}{2} (16\% - 12\%) \\ &= 12\% + 6\% = 18\%. \end{aligned}$$

## **H** Cost of Retained Earnings

The part of the distributable profit which is set aside without distributing among the shareholders in order to strengthen the financial position of the business, is called **Retained Earning**. This capital is also called **Internal Capital** because it is procured from the internal source of the business. How and why the cost of such capital is determined are discussed below :

### **H.1.** Meaning of Cost of Retained Earnings

A company does not generally distribute its entire amount of distributable profit among the shareholders as dividend. Every company retains a part of distributable profit as undistributed for the future expansion of its business. This part of the distributable profit is called **Retained Earnings**. If the retained earnings were distributed to the shareholders, they would have reinvested them after paying dividend tax in the similar risk related company by purchasing its equity shares, and as a result of it, they will get a return from such reinvestment. The rate of such return is known as **Cost of Retained Earnings**.

### **H.2.** Retained Earnings have no cost

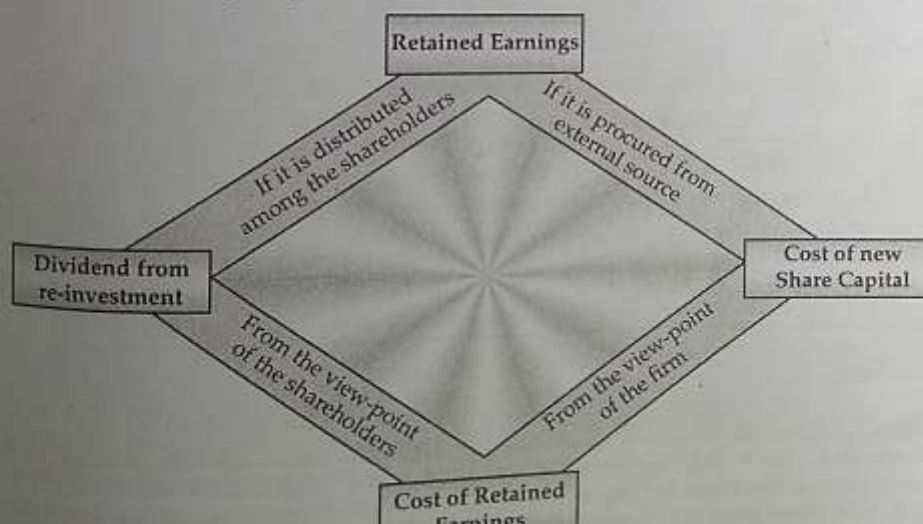
A firm does not have to pay any interest or dividend on its retained earnings. So, it apparently seems that the retained earnings have no cost. But this concept is not correct, because it will be seen that the retained earnings have cost whether it is considered from the view-point of the shareholders or firm. In order to explain this matter briefly, let us assume that the



shareholders do not have to pay any dividend tax or they do not have to bear any brokerage cost for purchasing the shares. Now the matter is discussed below from the view-point of the shareholders and firm :

- (i) **From the view-point of the shareholders :** If a company distributed its retained earnings among the shareholders, then the shareholders would purchase more new shares of that company out of the dividend received by them. As a result of it, they would get dividend on these new shares at the same rate as they are earning on their existing shares. Naturally, the shareholders expect same rate of dividend on retained earnings as they get on their existing shares. This expectation is the cost of retained earnings. So, it can be said that the cost of retained earnings is equivalent to the cost of equity share capital.
- (ii) **From the view-point of the firm :** If there is retained earnings in the hand of a firm, then it gets the advantage of using additional capital. Now, if the firm is required to procure such additional capital from external source by issuing new shares, then it has to pay dividend also on such new share at the same rate as is paid on existing share capital. Thus, the firm has to bear the cost for issuing the new shares. But the firm is not required to issue new shares for using the retained earnings. So, the cost of new share is equivalent to the opportunity cost of the retained earnings. Thus, it can be said that the cost of the retained earnings is equivalent to the cost of equity share capital.

On the basis of above discussion, it can be said that the concept of retained earnings have no cost, is not correct, it must have cost. The cost of retained earnings are shown below with the help of the following diagram :



### H.3. Cost of Retained Earnings is less than the Cost of Equity Share Capital

If a company distributes its retained earnings among the shareholders then they can purchase equity shares of a similar risk related company by that very dividend. As a result of it, they get equivalent amount of dividend on these new shares as received on their existing shares. So, naturally, the shareholders expect an equivalent amount of dividend to the existing shares on the retained earnings. So, this expectation is the cost of retained earnings. Thus, it can be said that the cost of retained earnings is equivalent to the cost of equity share capital, i.e. —

$$K_r = \frac{D}{P} + g \text{ [ where } K_r = \text{cost of retained earnings ]}$$

But if the retained earnings are distributed among the shareholders, then the shareholders will have to pay income tax on the dividend so received by them from the retained earnings. After paying the tax, if they use the residual money for purchasing new shares of a similar risk related company, then they will have to bear some brokerage costs. As a result, it will not be possible to invest equivalent amount of dividend. So, their investment in new shares will be low with compare to dividend received. If the rate of income tax is 't' and brokerage cost is 'B', then the cost of retained earnings will be —

$$K_r = \left( \frac{D}{P} + g \right) (1 - t) (1 - B)$$

$$\text{or, } K_r = K_e (1 - t) (1 - B) \left[ \because \frac{D}{P} + g = K_e \right]$$

Here  $0 < t < 1$  and  $0 < B < 1$ . So,  $K_r < K_e$  i.e., the cost of retained earnings will be lower than the cost of equity share capital. It can be mentioned in this context that — as neither any personal income tax nor any brokerage cost is required to be paid for the retained earnings, the cost of retained earnings is equal to the cost of equity share capital.

#### H.4. Formula for determining the Cost of Retained Earnings

If  $K_r$  be the cost of retained earnings, then —

$$K_r = E (1 - t) (1 - B)$$

where —

E = Shareholders' expected rate of dividend or Dividend yield ratio

$$\therefore E = \frac{\text{Dividend per share}}{\text{Market Price of Each share}}$$

t = Shareholders' personal rate of income tax

B = Brokerage cost to shareholders

**Note :** We know that the expected rate of return to the shareholders is equivalent to the cost of equity share capital. So, the above formula can also be written as —

$$K_r = K_e (1 - t) (1 - B)$$

$$\text{or, } K_r = \left( \frac{D}{P} + g \right) (1 - t) (1 - B) \left[ \because K_e = \frac{D}{P} + g \right]$$

Equity Shares.