

## LESSON - 9

# COST OF CAPITAL

### Objectives

The objectives of this lesson are to explain :

- \* the concept of cost of capital
- \* the significance of cost of capital
- \* the computation of specific cost of capitals
- \* the computation of weighted average cost of capital

### STRUCTURE :

- 9.1 Introduction
- 9.2 Cost of capital
- 9.3 Importance of cost of capital
- 9.4 Classification of cost of capital
- 9.5 Determination of cost of capital
- 9.6 Computation of cost of debt
- 9.7 Cost of preference capital
- 9.8. Cost of equity capital
- 9.9 Cost of retained earnings
- 9.10 Cost of Rights Issue
- 9.11 Cost of convertible securities
- 9.12 Computation of weighted Average Cost of capital
- 9.13 Summary
- 9.14 Key words
- 9.15 Self Assessment Questions / Exercises
- 9.16 Further Readings

### 9.1 Introduction

It has been discussed in lesson - 4 that for evaluating capital investment proposals according to the sophisticated techniques like Net Present Value and Internal Rate of Return, the criterion used to accept or reject a proposal is the cost of capital. The cost of capital plays a significant role in capital budgeting decisions. In the present lesson the concept of cost of capital and the methods for its computation are explained.

### 9.2 Cost of Capital

The term cost of capital refers to the minimum rate of return a firm must earn on its investments. This is in consonance with the firm's overall objective of wealth maximisation. Cost of capital is a complex, controversial but significant concept in financial management.

The following definitions give clarity about the cost of capital.

Hampton J. : The cost of capital may be defined as " the rate of return the firm requires from investment in order to increase the value of the firm in the market place."

**James C. Van Horne :** The cost of capital is “a cut-off rate for the allocation of capital to investments of projects. It is the rate of return on a project that will leave unchanged the market price of the stock.”

**Solomon Ezra :** “Cost of Capital is the minimum required rate of earnings or the cut-off rate of capital expenditure.”

It is clear from the above definitions that the cost of capital is that minimum rate of return which a firm is expected to earn on its investments so that the market value of its shares is maintained. We can also conclude from the above definitions that there are three basic aspects of the concept of cost of capital :

- i) **Not a cost as such :** In fact the cost of capital is not a cost as such, it is the rate of return that a firm requires to earn from its projects.
- ii) **It is the minimum rate of return :** A firm's cost of capital is that minimum rate of return which will at least maintain the market value of the shares.
- iii) It comprises three components :

$$k = r_o + b + f$$

where,  $k$  = cost of capital;

$r_o$  = return at zero risk level;

$b$  = premium for business risk, which refers to the variability in operating profit (EBIT) due to change in sales.

$f$  = premium for financial risk which is related to the pattern of capital structure.

### 9.3 Importance of cost of capital

The cost of capital is very important in financial management and plays a crucial role in the following areas :

i) **Capital budgeting decisions :** The cost of capital is used for discounting cash flows under Net Present Value method for evaluating investment proposals. So, it is very useful in capital budgeting decisions.

ii) **Capital structure decisions :** An optimal capital structure is that structure at which the value of the firm is maximum and cost of capital is the lowest. So, cost of capital is crucial in designing optimal capital structure.

iii) **Evaluation of Financial Performance :** Cost of capital is used to evaluate the financial performance of top management. The actual profitability is compared to the expected and actual cost of capital of funds and if profit is greater than the cost of capital the performance may be said to be satisfactory.

iv) **Other financial decisions :** Cost of capital is also useful in making such other financial decisions as dividend policy, capitalisation of profits, making the rights issue, etc.

### 9.4 Classification of cost of capital

Cost of capital can be classified as follows :

i) **Historical Cost and Future Cost :** Historical costs are book costs relating to the past, while future costs are estimated costs. Future costs are more relevant than historical costs in financial decision-making, whereas historical costs act as guide for estimation of future costs.

ii) **Specific Costs and Composite Cost :** Specific cost is the cost of a specific source of capital, while composite cost is combined cost of various sources of capital. Composite cost, also known as the weighted average cost of capital, should be considered in capital structure and capital budgeting decisions.

**iii) Explicit and Implicit Cost :** Explicit cost of any source of finance is the discount rate which equates the present value of cash inflows with the present value of cash outflows. It is the internal rate of return and is calculated with the following formula :

$$I_0 = \frac{C_1}{(I + K)^1} + \frac{C_2}{(I + K)^2} + \dots + \frac{C_n}{(I + K)^n}$$

$I_0$  = Net cash inflow received at zero point of time

$C$  = Cash outflow in the period concerned

$K$  = Explicit cost of capital

$n$  = Duration of time period

Implicit cost also known as the opportunity cost is the cost of the opportunity foregone in order to take up a particular project. For example, the implicit cost of retained earnings is the rate of return available to shareholders by investing the funds elsewhere.

**iv) Average Cost and Marginal Cost :** An average cost is the combined cost or weighted average cost of various sources of capital. Marginal cost of capital refers to the average cost of capital of new or additional funds required by a firm. It is the marginal cost which should be taken into consideration in investment decisions.

## 9.5 Determination of cost of capital

As stated already, cost of capital plays a very important role in making decisions relating to financial management. However, its determination is not an easy task. It involves the following problems.

### 9.5.1 Problems in determination of cost of capital :

- i) Conceptual controversy regarding the relationship between cost of capital and capital structure is a big problem.
- ii) Controversy regarding the relevance or otherwise of historic costs or future costs in decision making process.
- iii) Computation of cost of equity capital depends upon the expected rate of return by its investors. But the quantification of expectations of equity shareholders is a very difficult task.
- iv) Retained earnings has the opportunity cost of dividends foregone by the shareholders. Since different shareholders may have different opportunities for reinvesting dividends, it is very difficult to compute cost of retained earnings.
- v) Whether to use book value or market value weights in determining weighted average cost of capital poses another problem.

### 9.5.2 Computation of cost of capital :

Computation of cost of capital of a firm involves the following steps :

- i) Computation of cost of specific source of capital, viz., debt, preference capital, equity and retained earnings, and
- ii) Computation of weighted average cost of capital.



## 9.6 Cost of Debt ( $k_d$ )

Debt may be perpetual or redeemable debt. Moreover, it may be issued at par, at premium or at discount. The computation of cost of debt in each case is explained below.

### 9.6.1 Perpetual / irredeemable debt :

i) At par :

$$k_d = \text{Cost of debt before tax} = \frac{I}{P_0}$$

$k_d$  = Cost of debt;  $I$  = interest;  $P_0$  = net proceeds

$$k_d (\text{after-tax}) = \frac{I}{P} (1-t)$$

Where  $T$  = tax rate

#### Example : 1

i) A Ltd., issues Rs. 50,000 debentures of 8% at par. The tax rate is 50%. Determine the after tax cost of debt.

$$k_d (\text{before tax}) = \frac{\text{Rs. } 4000}{\text{Rs. } 50,000} \times 100 = 8\%$$

$$k_d (\text{after tax}) = k_d (\text{before tax}) \times (1 - T) = 8\% (1 - .5) = 4\%$$

ii) At premium or discount :

$$k_d (\text{before tax}) = \frac{I}{NP} \quad \text{where } I = \text{Interest}$$

$NP$  = net proceeds.

$$k_d (\text{after tax}) = \frac{I}{NP} (1-t)$$

#### Example : 2

i) B Ltd has Rs. 50,000, 8% debentures at a premium of 10%. The tax rate applicable to the company is 40%. Compute the after tax cost of debt.

$$\text{Answer : } k_d (\text{before - tax}) = \frac{I}{NP} = \frac{\text{Rs. } 4,000}{55,000} \times 100 = 7.27\%$$

$$k_d (\text{after-tax}) = \frac{I}{NP} (1-t) = \frac{\text{Rs. } 4,000}{55,000} \times (1 - .4) = 4.36\%$$

#### Example : 3

i) X Ltd has Rs. 1,00,000, 10% debentures issued at 5% discount. The tax rate is 40%. Compute the after tax cost of debt.

$$\text{Answer : } k_d (\text{before - tax}) = \frac{I}{NP} = \frac{\text{Rs. } 10,000}{\text{Rs. } 95,000} = 0.1053 \text{ or } 10.53\%$$

$$k_d (\text{after - tax}) = k_d (\text{before tax}) \times (1 - t) = 10.53 \times (1 - .4) = 10.53 \times .6 = 6.32\%$$

**Example :4**

Y Ltd issues Rs. 2,00,000, 9% debentures at a premium of 10%. The costs of floatation are 2%. The tax rate is 50%. Compute the after tax cost of debt.

$$\text{Answer : } k_d (\text{after - tax}) = \frac{I}{NP} (1-t) = \frac{\text{Rs. } 18,000}{\text{Rs. } 2,15,600} (1-0.5) = 4.17\%$$

$$[\text{net proceeds} = \text{Rs. } 2,00,000 + 20,000 - (\frac{2}{100} \times 2,20,000)]$$

**9.6.2 Redeemable debt :**

The debt repayable after a certain period is known as redeemable debt. Its cost is computed by using the following formula :

$$\text{i) Before - tax cost of debt} = \frac{I + \frac{1}{n}(P - NP)}{\frac{1}{2}(P + NP)}$$

I = interest; P = proceeds at par;

NP = net proceeds; n = No. of years in which debt is to be redeemed

$$\text{ii) After tax cost of debt} = \text{Before - tax cost of debt} \times (1 - t)$$

**Example :5**

A company issues Rs. 1,00,000 10% redeemable debentures at a discount of 5%. The costs of floatation amount to Rs. 3,000. The debentures are redeemable after 5 years. Compute before - tax and after - tax Cost of debt. The tax rate is 50%.

**Solution :**

$$\begin{aligned} \text{Before tax cost of debt} &= \frac{I + \frac{1}{n}(P - NP)}{\frac{1}{2}(P + NP)} \\ &= \frac{10,000 + \frac{1}{5}(1,00,000 - 92,000)}{\frac{1}{2}(1,00,000 + 92,000)} = \frac{10,000 + 1600}{96,000} = \frac{11,600}{96,000} = 12.08\% \end{aligned}$$

$$[NP = 1,00,000 - 5,000 - 3,000 = 92,000]$$

$$\text{After tax cost of debt} = \text{Before - tax cost} \times (1-t) = 12.08 \times (1-0.5) = 6.04\%$$

**9.7 Cost of Preference Capital ( $k_p$ )**

In case of preference shares dividends are payable at a fixed rate. However, the dividends are not allowed to be deducted for computation of tax. So, no adjustment for tax is required just like debentures, preference shares may be perpetual or redeemable. Further, they may be issued at par, premium or discount.

**9.7.1 Perpetual preference Capital :**

- i) If issued at par :  $K_p = \frac{D}{P}$

$K_p$  = Cost of preference capital

$D$  = Annual preference dividend

$P$  = Proceeds at par value

- ii) If issued at premium or discount :

$$K_p = \frac{D}{NP} \quad \text{Where NP = net proceeds.}$$

**Example : 6**

A company issues 10,000 10% preference shares of Rs. 10 each. Cost of issue is Rs. 2 per share. Calculate cost of preference capital, if these shares are issued (a) at par, (b) at 10% premium, and (c) at 5% discount.

**Solution :** Cost of preference capital,  $(K_p) = \frac{D}{NP}$

- a) When issued at par :

$$K_p = \frac{\text{Rs. } 10,000}{1,00,000 - 20,000} \times 100 = \frac{10,000}{80,000} \times 100 = 12.5\%$$

[Cost of issue = 10,000 x Rs. 2 = Rs. 20,000]

- b) When issued at 10% premium :

$$K_p = \frac{\text{Rs. } 10,000}{1,00,000 + 10,000 - 20,000} \times 100 = \frac{10,000}{90,000} \times 100 = 11.11\%$$

- c) When issued at 5% discount :

$$K_p = \frac{\text{Rs. } 10,000}{1,00,000 - 5,000 - 20,000} \times 100 = \frac{10,000}{75,000} \times 100 = 13.33\%$$

**9.7.2 Redeemable preference shares :** It is calculated with the following formula :

$$K_p = \frac{D + \frac{MV - NP}{n}}{\frac{1}{2}(MV + NP)}$$

Where,  $K_p$  = Cost of preference capital

$D$  = Annual preference dividend

$MV$  = Maturity value of preference shares

$NP$  = Net proceeds of preference shares

**Example : 7**

A company issues 1,00,000 10% preference shares of Rs. 10 each. Calculate the cost of preference capital if it is redeemable after 10 years.

- a) at par                      b) at 5% premium

**Solution :**

$$K_p = \frac{D + \frac{I}{n}(MV - NP)}{\frac{1}{2}(MV + NP)} \times 100$$

- a) Cost of preference capital, if redeemable at par :

$$K_p = \frac{Rs.1,00,000 + \frac{1}{10}(10,00,000 - 10,00,000)}{\frac{1}{2}(10,00,000 + 10,00,000)} \times 100 = \frac{Rs.1,00,000}{Rs.10,00,000} \times 100 = 10\%$$

- b) If redeemable at a premium of 5%  $K_p = \frac{Rs.1,00,000 + \frac{1}{10}(10,50,000 - 10,00,000)}{\frac{1}{2}(10,50,000 + 10,00,000)} \times 100$
- $$= \frac{Rs.1,00,000 + 5,000}{Rs.10,25,000} \times 100 = \frac{Rs.1,05,000}{Rs.10,25,000} \times 100 = 10.24\%$$

**9.8 Cost of Equity capital ( $K_e$ ) :**

Cost of equity is the expected rate of return by the equity shareholders. Some argue that, as there is no legal binding for payment, equity capital doesnot involve any cost. But it is not correct. Equity shareholders normally expect some dividend from the company while making investment in shares. Thus, the rate of return expected by them becomes the cost of equity. Conceptually, cost of equity share capital may be defined as the minimum rate of return that a firm must earn on the equity part of total investment in a project in order to leave unchanged the market price of such shares. For the determination of cost of equity capital it may be divided into two categories :

- i) external equity or new issue of equity shares.
- ii) retained earnings.

The cost of external equity can be computed as per the following approaches :

**9.8.1. Dividend Yield / Dividend Price Approach :** According to this approach, the cost of equity will be that rate of expected dividends which will maintain the present market price of equity shares. It is calculated with the following formula :

$$K_e = \frac{D}{NP} \quad (\text{For new equity shares})$$



$$\text{or } K_e = \frac{D}{MP} \quad (\text{For existing shares})$$

Where,  $K_e$  = Cost of equity

$D$  = Expected dividend per share

$NP$  = Net proceeds per share

$MP$  = Market price per share

This approach rightly recognises the importance of dividends. However, it ignores the impact of retained earnings on the market price of equity shares. This method is suitable only when the company has stable earnings and stable dividend policy over a period of time.

#### Example : 8

A company issues 10,000 equity shares of Rs. 100 each at a premium of 10%. The company has been paying 20% dividend to equity shareholders for the past five years and expects to maintain the same in the future also. Compute cost of equity capital. Will it make any difference if the market price of equity share is Rs. 150?

#### Solution :

$$K_e = \frac{D}{NP} = \frac{Rs.20}{Rs.110} \times 100 = 18.18\%$$

If the market price per share = Rs. 150.

$$K_e = \frac{D}{MP} = \frac{Rs.20}{Rs.150} \times 100 = 13.33\%$$

**9.8.2. Dividend Yield plus Growth in Dividend Method :** According to this method, the cost of equity is determined on the basis of the expected dividend rate plus the rate of growth in dividend. This method is used when dividends are expected to grow at a constant rate.

Cost of equity is calculated as :

$$K_e = \frac{D_1}{NP} + g \quad (\text{for new equity issue})$$

Where,

$D_1$  = expected dividend per share at the end of the year. [ $D_1 = D_0 (1+g)$ ]

$NP$  = net proceeds per share

$g$  = growth in dividends

Cost of equity for existing shares is calculated as :

$$\frac{D_1}{MP} + g$$

Where,

$MP$  = market price per share.



**Example : 9**

ABC Ltd plans to issue 1,00,000 new equity shares of Rs. 10 each at par. The floatation costs are expected to be 5% of the share price. The company pays a dividend of Rs 1. per share and the growth rate in dividends is expected to be 5%. Compute the cost of new issue of shares.

If the current market price of the share is Rs. 15, calculate the cost of existing equity share capital.

**Solution :**

$$\text{Cost of new equity shares} = (K_e) = \frac{D}{NP} + g$$

$$K_e = \frac{1}{(10 - .50)} + 0.05 = \frac{1}{9.5} + 0.05$$

$$= 0.1053 + 0.05$$

$$= 0.1553 \text{ or } 15.53\%$$

$$\text{Cost of existing equity shares : } K_e = \frac{D}{MP} + g$$

$$K_e = \frac{1}{Rs.15} + 0.05 = 0.0667 + 0.05 = 0.1167 \text{ or } 11.67\%.$$

**9.8.3. Earnings Yield Method :** According to this approach, the cost of equity is the discount rate that capitalises a stream of future earnings to evaluate the shareholdings. It is calculated by taking earnings per share (EPS) into consideration. It is calculated as :

$$i) \quad K_e = \frac{\text{Earnings per share}}{\text{Net proceeds}} = \frac{EPS}{NP} \text{ [For new shares]}$$

$$ii) \quad K_e = \frac{EPS}{MP} \text{ [for existing equity]}$$

**Example : 10**

XYZ Ltd is planning for an expenditure of Rs. 120 lakhs for its expansion programme. No. of existing equity shares are 20 lakhs and the market value of equity share is Rs. 60. It has net earnings of Rs. 180 lakhs.

Compute the cost of existing equity share capital and the cost of new equity capital assuming that new shares will be issued at a price of Rs. 52 per share and the costs of new issue will be Rs. 2 per share.

**Solution :**

$$a) \quad \text{Cost of existing equity} = (K_e) = \frac{EPS}{MP}$$

$$\text{Earnings per share (EPS)} = \frac{1,80,00,000}{20,00,000} = Rs. 9$$

$$\therefore K_e = \frac{9}{60} = 0.15 \text{ or } 15\%$$

$$\text{b) Cost of new equity capital : } (K_e) = \frac{EPS}{NP} = \frac{9}{52-2} = \frac{9}{50} = 0.18 \text{ or } 18\%$$

**9.8.4. Realised Yield Method :** One of the major limitations of using dividend yield or earnings yield methods is that it is not possible to estimate future dividends and earnings correctly. To remove this drawback, realised yield method may be used. This method takes into account the actual rate of return realised in the past. The dividend received in the past and the gain realised at the time of sale of shares should be considered for the calculation of the average rate of return. This approach gives fairly good results in case of companies with stable dividends and growth record.

### 9.9 Cost of Retained Earnings ( $K_r$ ) :

Retained earnings refer to undistributed profits of a firm. Out of the total earnings, firms generally distribute only a part of them in the form of dividends and the rest will be retained within the firms. Since no dividend is required to be paid on retained earnings, some people feel that 'retained earnings carry no cost'. But this approach is not appropriate. Retained earnings has the opportunity cost of dividends foregone by the investors. The rate of return that could have been earned by investors by investing dividends in alternative investments becomes cost of retained earnings. Hence, shareholders expect a return on retained earnings at least equal to cost of equity.

$$\therefore K_r = K_e = \frac{D}{NP} + g$$

However, while calculating cost of retained earnings, two adjustments should be made : a) Income - tax adjustment as the shareholders are to pay some income tax out of dividends, and b) adjustment for brokerage cost as the shareholders should incur some brokerage cost while investing dividend income. Therefore, after these adjustments, cost of retained earnings is calculated as :

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

Where,  $K_r$  = cost of retained earnings

$K_e$  = cost of equity

$t$  = rate of tax

$b$  = cost of purchasing new securities or brokerage cost.

#### Example :11

A firm's cost of equity ( $K_e$ ) is 18%, the average income tax rate of shareholders is 30% and brokerage cost of 2% is expected to be incurred while investing their dividends in alternative securities. Compute the cost of retained earnings.

$$\begin{aligned} \text{Solution : Cost of retained earnings} &= (K_r) = K_e (1-t) (1-b) = 18 (1-.30) (1-.02) \\ &= 18 \times .7 \times .98 = 12.35\% \end{aligned}$$

### 9.10 Cost of Rights Issue

Rights issue is an invitation to the existing shareholders to subscribe for further shares to be issued by a company. A right simply means an option to buy certain securities at a certain privileged price which is considerably below the market price. It is generally felt that the cost of rights issue would be different from the

cost of direct issue. But for two reasons, the real cost of rights issue would be the same as the cost of direct issue of shares to the public.

- i) the shareholder who is not interested in the rights issue, sells his right and obtains cash. Then he has the old shares plus the money obtained from selling the rights.
- ii) otherwise, the shareholder exercises his right and acquires the new shares, in addition to the old shares.

Thus, the present wealth of the shareholder in both the cases remains the same.

### 9.11 Cost of Convertible Securities :

Convertible securities or debentures are another type of instruments for mobilisation of debt capital. In this case the debentureholder is entitled to full or a part of the value of the debenture being converted into equity shares. The price at which the debenture is convertible into equity share is known as "conversion price". This conversion price is declared at the time of the issue of debentures itself.

When the bondholder exercises his option of conversion, he enjoys two benefits - interest on bonds till the date of conversion and increased market value of the shares at the time of conversion. Hence, the cost of convertible securities is taken to be that rate of discount which equates the after-tax interest and the expected market value of the share at the end of the option period, with the current market value of bond.

This is calculated with the help of following formula :

$$P_o = \sum_{t=1}^n \frac{I(1-t)}{(1+K_c)^t} + \frac{P_n(CR)}{(1+K_c)^n}$$

Where,

$P_o$  = Current market value of debenture

$I$  - Interest

$t$  = tax rate

$K_c$  = Rate of discount or cost of convertible security.

$n$  = no. of years at the end of which conversion takes place.

$CR$  = conversion ratio or the no. of shares the bond - holder gets on conversion.

### 9.12 Wegtred Average Cost of Capital ( $K_o$ ) :

It is the average of the costs of various sources of financing. It is also known as composite or overall or average cost of capital.

After computing the cost of individual sources of finance, the weighted average cost of capital is calculated by putting weights in the proportion of the various sources of funds to the total.

Weighted average cost of capital is computed by using either of the following two types of weights :

- 1) Market value
- 2) Book Value

Market value weights are sometimes preferred to the book value weights as the market value represents the true value of the investors. However, market value weights suffer from the following limitations :

- i) market values are subject to frequent fluctuations.
- ii) equity capital gets more importance, with the use of market value weights.



moreover, book values are readily available.

average cost of capital is computed as follows :

$$K_w = \frac{\sum xw}{\sum W}$$

Where,  $K_w$  = weighted average cost of capital

$x$  = cost of specific source of finance

$w$  = weights (proportions of specific sources of finance in the total)

The following steps are involved in the computation of weighted average cost of capital :

- i) multiply the cost of each source with the corresponding weight.
- ii) add all these weighted costs so that weighted average cost of capital is obtained.

### Example : 12

From the following capital structure and after - tax cost for different sources of funds, compute the weighted average cost of capital of a firm

Source of funds	Amount	After - tax cost of capitals
Equity capital	4,50,000	0.14
Retained earnings	1,50,000	0.13
Preference share capital	1,00,000	0.10
Debentures	3,00,000	0.05
	<u>10,00,000</u>	

### Solution :

Computation of weighted average cost of capital

Sources of funds (1)	Amount (2) (Rs.)	Proportion (3)	After - tax (4)	Weighted cost (5) (3 x 4 = 5)
Equity capital	4,50,000	.45	14%	6.30
Retained Earnings	1,50,000	.15	13%	1.95
Preference capital	1,00,000	.10	10%	1.00
Debentures	3,00,000	.30	5%	1.50
Total	<u>10,00,000</u>			<u>10.75</u>

∴ Weighted average cost of capital = 10.75%

**Example :13**

Following are the details regarding the capital structure of a company :

<i>Source of funds</i>	<i>Book Value</i>	<i>Market Value</i>	<i>Secific cost of capital</i>
Debentures	Rs. 4,00,000	Rs. 3,80,000	5%
Preference Capital	Rs. 1,00,000	Rs. 1,10,000	8%
Equity Capital	Rs. 6,00,000	Rs. 12,00,000	13%
Retained Earnings	Rs. 2,00,000		9%
<b>Total</b>	<b>13,00,000</b>	<b>16,90,000</b>	

You are required to determine the weighted average cost of capital using (i) book value weights, (ii) market value weights.

**Solutions :**

i) Computation of weighted average cost of capital using book value weights :

<i>Source of funds (1)</i>	<i>Amount (2) (Rs.)</i>	<i>Proportion (3)</i>	<i>After-tax cost (4)</i>	<i>weighted cost (5) (3 x 4 = 5)</i>
Debentures	4,00,000	0.31	5%	1.55
Preference capital	1,00,000	0.08	8%	0.64
Equity Capital	6,00,000	0.46	13%	5.98
Retained earnings	2,00,000	0.15	9%	1.35
<b>Total</b>	<b>13,00,000</b>	<b>1.00</b>		<b>9.52</b>

Weighted average cost of capital = 9.52%

ii) Computation of weighted average cost of capital by using market value weights :

<i>Sources of funds</i>	<i>Amount (Rs.)</i>	<i>Proportion</i>	<i>After - tax cost of capital</i>	<i>Weighte cost of capital (3 x 4 = 5)</i>
Debentures	3,80,000	0.23	5%	1.15
Preference capital	1,10,000	0.07	8%	0.56
Equity capital	9,00,000	0.53	13%	6.89
Retained earnings	3,00,000	0.17	9%	1.53
<b>Total</b>	<b>16,90,000</b>	<b>1.00</b>		<b>10.13</b>

Weighted average cost of capital = 10.13%

Notes : market value of equity and retained earnings is determined in the proportion of their book values.

$$\therefore \text{market value of equity} = 12,00,000 \times \frac{6}{8} = 9,00,000$$

$$\text{market value of retained earnings} = 12,00,000 \times \frac{2}{8} = 3,00,000$$

### 9.13 Summary

Cost of capital is the minimum rate of return a firm must earn on its investments. It is a complex, controversial but a significant concept in financial management. It plays a crucial role in all the financial decisions.

Computation of cost of capital involves i) computation of specific cost of capitals, and ii) weighted average cost of capital. In this lesson, we have learned the computation of cost of specific capitals, viz., equity, preference retained earnings and debt and also the weighted average cost of capital.

### 9.14 Key Words :

**Cost of capital :** The minimum rate of return, the firm must earn on its investments to maintain the market value of its shares.

**Bonds :** Long term instruments of debt capital.

**Coupon rate :** The stated rate of interest on debentures or bonds.

**Flotation costs :** The costs incurred in issuing of securities. Ex : brokerage, underwriting commission etc.

### 9.15 Self Assessment Questions / Exercises

1. What is cost of capital ? Explain the significance of cost of capital in financial decisions.
2. What is cost of capital? Explain the components of cost of capital.
3. Critically examine the different approaches for computing cost of equity.
4. What is weighted average cost of capital? Explain how it is computed.
5. Assuming that the firm pays tax at 50% rate, compute the after - tax cost of capital in the following cases :

- i) a 8.5% preference share sold at par
- ii) a perpetual bond sold at par, coupon rate of interest being 7 per cent
- iii) a ten-year 8 per cent, Rs. 1000 per bond sold at Rs. 950 less 4 per cent underwriting commission.
- iv) a Preference share sold at Rs. 100 with 9 per cent dividend, redeemable at Rs. 110 in five years.
- v) a common share selling at a current market price of Rs. 120 and paying a current dividend of Rs. 9 per share which is expected to grow at a rate of 8 per cent.
- vi) a common share of a company is selling for Rs. 50. The earnings per share is Rs. 7.50, of which sixty per cent is paid in dividends. The company reinvests retained earnings at a rate of 10 per cent.

(Hint : growth rate (g) = br; where b = retention ratio and r = return on reinvestment).

[Ans : i) 8.5%; ii) 3.5% iii) 4.36%; iv) 10.5% v) 16.1% vi) 13%]



6. From the details given below, calculate the overall cost of capital of a firm using (a) book value weights, and (b) market value weights :

<i>Sources of capital</i>	<i>Book value</i> (Rs.)	<i>Market value</i> (Rs.)	<i>After - tax-cost of capital</i> (%)
Equity share capital (Rs. 10 each)	4,50,000	9,00,000	14
Retained earnings	1,50,000		13
Preference capital	1,00,000	1,00,000	10
Debentures	3,00,000	3,00,000	5

- [Ans : weighted average cost of capital :  
 a) at book value weights : 10.75%  
 b) market value weights : 11.44%.]

### 9.16 Further Readings

Van Horne, James C. : Financial Management

Khan M.Y. and Jain P.K. : Financial Management

Prasanna Chandra : Financial Management.

Bhalla V.K. : Financial Management.

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