UNIT – III

COST OF CAPITAL

Meaning of Cost of Capital

Cost of capital is the rate of return that a firm must earn on its project investments to maintain its market value and attract funds.

Cost of capital is the required rate of return on its investments which belongs to equity, debt and retained earnings.

Definitions

The following important definitions are commonly used to understand the meaning and concept of the cost of capital.

According to the definition of John J. Hampton " Cost of capital is the rate of return the firm required from investment in order to increase the value of the firm in the market place".

According to the definition of Solomon Ezra, "Cost of capital is the minimum required rate of earnings or the cut-off rate of capital expenditure".

Cost of Equity Capital

- Dividend price (D/P) approach
- Dividend price plus growth (D/P + g) approach
- Earning price (E/P) approach

Dividend Price Approach

$$Ke = D/Np$$

Where,

Ke = Cost of equity capital

D = Dividend per equity share

Np = Net proceeds of an equity share

Exercise 1

A company issues 10,000 equity shares of Rs. 100 each at a premium of 10%. The company has been paying 25% dividend to equity shareholders for the past five years and expects to maintain the same in the future also. Compute the cost of equity capital. Will it make any difference if the market price of equity share is Rs. 175?

Solution

$$Ke = D/Np$$

$$= 25/ 100 \times 100$$

$$Ke = 22.72\%$$

If the market price of a equity share is Rs. 175.

$$Ke = D/ Np$$

$$= 25/175 \times 100$$

$$Ke = 14.28\%$$

(ii). Dividend Price Plus Growth Approach

$$Ke = \frac{D}{Np} + g$$

Where,

Ke = Cost of equity capital

D = Dividend per equity share

g = Growth in expected dividend

Np = Net proceeds of an equity share

Exercise 2

(a) A company plans to issue 10000 new shares of Rs. 100 each at a par. The floatation costs are expected to be 4% of the share price. The company pays a dividend of Rs. 12 per share initially and growth in dividends is expected to be 5%. Compute the cost of new issue of equity shares.

(b) If the current market price of an equity share is Rs. 120. Calculate the cost of existing equity share capital.

$$(a),\ Ke = \frac{D}{Np} + g \qquad Ke = \frac{12}{100 - 4} + 5 = 17.5\%$$

$$(b).\ Ke = \frac{12}{120} + 5 = 15\%$$

Exercise 3

The current market price of the shares of A Ltd. is Rs. 95. The floatation costs are Rs. 5 per share amounts to Rs. 4.50 and is expected to grow at a rate of 7%. You are required to calculate the cost of equity share capital.

Solution

Market price Rs. 95

Dividend Rs. 4.50

Growth 7%.

$$\text{(a), } Ke = \frac{D}{Mp} + g \qquad Ke = \frac{4.50}{95} + 0.07 = 11.73\%$$

(ii). Earning Price Approach

$$\text{(a)} \quad Ke = \frac{E}{Np}$$

Where,

Ke = Cost of equity capital

E = Earning per share

Np = Net proceeds of an equity share

Exercise 4

A firm is considering an expenditure of Rs. 75 lakhs for expanding its operations. The relevant information is as follows : Number of existing equity shares =10 lakhs Market value of existing share =Rs.100 Net earnings =Rs.100 lakhs Compute the cost of existing equity share capital and of new equity capital assuming that new shares will be issued at a price of Rs. 92 per share and the costs of new issue will be Rs. 2 per share.

Solution

Cost of existing equity share capital: $Ke = \frac{E}{Np}$

Earnings Per Share(EPS) = 100lakhs/ 10lakhs = Rs.10

Ke = 10/100 × 10 =10%

Ke =10 /92 - 2 × 100 = = 11.11%

1. The Market price of the share s Rs.140 and a company plan to pay a dividend of Rs. 9 per share. The growth in Dividend estimated at the rate of 10%. Find out the cost of equity capital. (April 2014)
2. Anand Ltd. Offer for public subscription equity share of Rs.10 each at a premium of 10%.

The company pays an underwriting commission of 5% on the issue price. The shareholders expect a dividend of 15%.

a). Calculate the cost of equity capital

(b). Calculate the cost of equity capital, if the market price of the share is Rs.20. (Nov 2016)

3. A Company issues equity shares of Rs.20 each at a premium of 10%. The company pays 5% of the price as Under writing Commission. The Expected rate of dividend is 20%. Find the cost of equity. What is the cost of equity if the market price is Rs.20.

4. The Current Market price of an Equity share of a company is Rs.85. The Current Dividend per share is Rs.4.25. In case the dividends are expected to grow at the rate of 7%, ascertain the cost of equity.

Cost of Debt

- Debt Issued at Par
- Debt Issued at Premium
- Debt Issued at or Discount

Debt Issued at Par

$$Kd = (1 - t) R$$

Where,

Kd = Cost of debt capital

t = Tax rate

R = Debenture interest rate

COST OF DEBT

Cost of Irredeemable Debt

Problem : 1. A company issue 12% Irredeemable debenture of Rs.50,00,000. The company is in 50% tax bracket. Calculate the cost of debt (before as well as after tax) if the debenture are issued at (i).Par (ii). 5% Discount and (iii). 10%.

Solution :

(i). Issued at Par :

I = 50,00,000 x 12/100 = Rs.6,00,000

Np = 50,00,000

Before-tax cost

$$(Kd) = I / Np = Rs.6,00,000 / 50,00,000 = 0.12 \text{ (or) } 12\%$$

After -tax cost

$$(Kd) = \frac{I}{Np}(1 - t) = \frac{Rs.6,00,000}{Rs.50,00,000}(1 - 0.50) = \frac{Rs.6,00,000}{Rs.50,00,000}(0.50) = 0.06 \text{ (or) } 6\%$$

(ii). Issued at 5% discount:

I = 50,00,000 x 12/100 = Rs.6,00,000

Discount = 50,00,000 x 5/100 = 2,50,000

Np = 50,00,000 – 2,50,000 = Rs.47,50,000

Before-tax cost

$$(Kd) = I / Np = Rs.6,00,000 / 47,50,000 = 0.1263 \text{ (or) } 12.63\%$$

(ii). Issued at 5% discount:

After -tax cost

I = 50,00,000 x 12/100 = Rs.6,00,000

Discount = 50,00,000 x 5/100 = 2,50,000

Np = 50,00,000 – 2,50,000 = Rs.47,50,000

After -tax cost

$$(Kd) = \frac{I}{Np}(1-t) = \frac{Rs.6,00,000}{Rs.47,50,000}(1-0.50) = \frac{Rs.6,00,000}{Rs.47,50,000}(0.50) = 0.0632\% \text{ (or) } 6.32\%$$

(ii). Issued at 10% Premium:

Before-tax cost

(Kd) = I/ Np = Rs.6,00,000/55.50,000 = 0.1091 (or) 10.91%

I = 50,00,000 x 12/100 = Rs.6,00,000

Premium = 50,00,000 x 10/100 = 5,00,000

Np = 50,00,000 + 5,00,000 = Rs.55,00,000

After -tax cost

$$(Kd) = \frac{I}{Np}(1-t) = \frac{Rs.6,00,000}{Rs.55,50,000}(1-0.50) = \frac{Rs.6,00,000}{Rs.55,50,000}(0.50) = 0.0545\% \text{ (or) } 5.45\%$$

Cost of Redeemable Debt

Problem :2

A company issue 10 years 8% debentures at Rs.90 (face value Rs.100). The marginal of interest applicable to the company is 50%. Calculate cost of debt after tax.

Solution :

Before-tax cost

$$Kd\ (\text{Before Tax}) = \frac{I + (P - NP)/n}{(P + NP)/2} = \frac{8 + (100 - 90)/10}{(100+90)/2} = \frac{9}{95} = 0.095 \text{ or } 9.5\%$$

I = 100 x 8/100 = 8

Np = 100, P = 90

N = 10

After -tax cost

$$(Kd) = \frac{I}{Np}(1 - t) = \frac{8}{Rs.90}(1 - 0.50) = \frac{8}{Rs.90}(0.50) = 0.095\% \text{ (or) } 9.5\%$$

Problem : 3. A firm issues 11% debentures of Rs.10,00,000 payable at the end of 10^{th} year in lump sum. It allowed 2% commission to brokers. The tax rate being 50%. Find out the cost of Debt.

Solution :

Solution :

Before-tax cost

$$K_d = \frac{I + (P - NP)/n}{(P + NP)/2}$$

$$K_d = \frac{1{,}10{,}000 + (10{,}00{,}000 + 9{,}80{,}000)/2}{(10{,}00{,}000 + 9{,}80{,}000)/2}$$

$$= 0.1131 \text{ (or) } 11.31\%$$

I = 10,00,000 x 11/100 = 1,10,000

P = 10,00,000

Communication = 10,00,000 x 2/100 = 20,000

NP = 10,00,000,- 20,000 = 9,80,000

P = 10,00,000

After -tax

$$(K_d) = \frac{I}{Np}(1 - t) = \frac{1{,}10{,}000}{Rs.9{,}80{,}000}(1 - 0.50) = \frac{1{,}10{,}000}{Rs.\ 9{,}80{,}000}(0.50) = 0.0566\% \text{ (or) } 5.66\%$$

Problem : 3

A Company issue 5,000 12% debenture of Rs. 100 each at a discount of 5% commission payable is Rs. 25,000. Debenture are payable after 5 years. Calculate the cost of debenture after tax assuming tax 50%. (April 2012, April 2016).

Solution:

After -tax cost

$$Kd\ (After\ Tax) = \frac{I}{NP}(1-t) = \frac{Rs.60,000}{Rs.4,75,000}(1.-0.50) = = 0.063\ (Or)\ 6.3\%$$

Before-tax cost

$$Kd\ (Before\ Tax) = \frac{I + (P - NP)/n}{(P + NP)/2}$$

$$Kd = \frac{Rs.\ 60,000 + (Rs.5,00,000 - Rs.4,75,000)/5}{(Rs.5,00,000 + Rs.4,75,0000)/2} =$$

$$= 0.13 \text{ or } 13\%$$

I = 5,000 x 100 = 5,00,000 x12/100 = Rs.60,000.

NP = Rs.5,00,000 – Rs. 25,000 = Rs.4,75,000

t = 50.

P = Rs.5,00,000

Problem : 4

A firm issues debentures of Rs. 1, 00,000 and realizes Rs.98,000 after allowing 2% commission to brokers. The debentures carry an interest rate of 10%. The debentures are due for maturity at the end of the 10th year. Tax rate is 55%. You are required to calculate the effective cost of debt after tax and before tax.

Solution :

Before-tax cost

$$Kd = \frac{I + (P - NP)/n}{(P + NP)/2} = \frac{10{,}000 + (1{,}00{,}000 - 98{,}000)/10}{(1{,}00{,}000 + 98{,}000)/2}$$

$$= 0.1030 \text{ or } 10.30\%$$

I = 1,00,000 x 10/100 = Rs.10,000.

NP = 98,000

t = 55.

P = Rs.1,00,000

$$Kd \text{ (After Tax)} = \frac{I}{NP}(1 - t) = \frac{Rs.10,000}{Rs.98,000}(1. - 0.55) = 0.0459 \text{ or } 4.5\ \%$$

Cost of preference share (Kp)

- ✓ Cost of Irredeemable preference share
- ✓ Cost of Redeemable preference share

Problem : 4

A company issue 10,000, 10% preference share of Rs. 100 each. Cost of issue is Rs. 2 per share. Calculate cost of preference capital if share issued at par.

Solution

$$Kp = \frac{Dp}{Np} = \frac{1,00,000}{9,80,000} = 0.1020 \text{ or } 10.20\%$$

Dp = 10,000 X 100 = 10,00,000 X 10/100 = 1,00,000

Np = 10,00,000 – 20,000 = 9,80,000

Problem :5.

A Company issue 9% Preference share of Rs. 100 each at a premium of Rs.5 per share. The issue expenses per share come to Rs.3. Calculate cost of preference share.

Solution

$$Kp = \frac{Dp}{Np} = \frac{Rs.9}{Rs.102} = 0.088 \text{ or } 8.82\ \%$$

Np = Rs.100 + Rs. 5 = Rs.105 – 3 = Rs.102

Problem ; 6

A company has 10% redeemable preference share of Rs.1,00,000 redeemable at the end of the 10th year from the year of their issue. The underwriting costs came to 2%. Calculate the cost of preference share capital.

Solution

$$KP = \frac{D + (P - NP)/n}{(P + NP)/2}, \quad \frac{10,000 + (1,00,000 - 98,000)/10}{(1,00,000 + 98,000)/2} = \frac{Rs.10,200}{Rs.99,000} = 0.1030 \text{ or } 10.30\ \%$$

Problem: 7. Alpha Ltd. Issues 10% Redeemable preference share of Rs. 100 each, redeemable after 10 years. The flotation costs are 5% of the nominal value. Compute the effective cost to the company, if the issue is made at (a) Par (b) a premium of 5% and (c). at a discount of 5%.

Solution :

(a) Issued at Par :

$$KP = \frac{D + (P - NP)/n}{(P + NP)/2}, = \frac{10 + (100 - 95)/10}{(100 + 95)/2} = \frac{10.5}{98.5} = \mathbf{0.106 \text{ or } 10.65\%}$$

(b) Issued at 5% Premium:

$$KP = \frac{D + (P - NP)/n}{(P + NP)/2}, \frac{10 + (105 - 99.75)/10}{(100 + 99.75)/2} \frac{10.53}{99.87} = \mathbf{0.105 \text{ or } 10.54\%}$$

(c) Issued at 5% Discount:

$$KP = \frac{D + (P - NP)/n}{(P + NP)/2}, \frac{10 + (95 - 90.25)/10}{(95 + 90.25)/2} \frac{10.47}{92.63} = \mathbf{0.1130\ 11.30\%}$$