Name of Expert: Dr. Deepak R. Raste Mobile No: 9428802319 Email: deepakraste@gmail.com Paper 303 Business Finance Unit: 3 Cost of capital and Financing Decision No. of Total Lectures: 2 Lecture No. First Lecture Name: Cost of Capital

Cost of Capital

Objectives: After studying this e lecture you will be able to learn:

- 1. Concept of cost of capital
- 2. Calculation of Cost of Equity Capital
- 3. Calculation of Cost of Preference capital
- 4. Calculation of Cost of Retained earnings
- 5. Calculation of Cost of Debt
- 6. Calculation of Weighted Average Cost of capital
- 7. Concept of Marginal Cost of Capital

Introduction:

There are three main finance decision namely Financing Decision, Investing Decision and Distribution Decision.

Let us see what is financing decision?

Financing decision refers to acquisition of required funds. A corporate entity can raise funds through issue of equity shares, Preference shares, Debentures or Bonds, borrowings of loan and by utilizing retained earnings. Every source of funds has its own cost which includes issue expenses, dividend on preference shares and interest on debt and even opportunity cost of retained earnings.

Now let us clarify what is Investing Decision?

Investing decision refers to employment of finance raised in the business for longer period of time. The decision of purchased of non current assets like plant and machinery, land and building, tools and equipment, furniture, vehicles, long term investments etc. is investing decision.

The third decision of distribution decision refers to how much profit to be distributed by way of dividend and how much profit should be retained in the business for future growth of the business.

Now Let us understand the Concept of cost of capital:

Cost of Capital is the rate of return that a firm must earn on its investments to maintain its market value. Cost of capital is the required rate of return on its investments which belongs to equity, debt and retained earnings. If a firm fails to earn return at the expected rate, the market value of the shares will fall and it will result in the reduction of overall wealth of shareholders.

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

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

According to James C. Van Horne, Cost of capital is "A cut-off rate for the allocation of capital to investment of projects. It is the rate of return on a project that will leave unchanged the market price of the stock".

A firm's return on investment must be at least equal to the cost of capital. Hence cost of capital is defined as the cut-off rate or target rate or hurdle rate or required rate of return. The finance manager must take careful decision of raising funds keeping in view its cost of capital because cost of capital affects earning capacity and value of the firm.

Cost of capital is based on certain assumptions which are closely associated to computation of the cost of capital. These assumptions are:

1. It is not a cost as such. It is merely a hurdle rate.

2. It is the minimum rate of return.

3. It consists of three important risks such as zero risk, business risk and financial risk.

After understanding the concept of cost of capital and financing decision let us see the relationship between these two.

As we discussed Financing decision is a decision of using a particular source of capital to raise fund. It is obvious that a wise financial manager will compare cost of capital of each alternative source of fund and the most cheapest source will be preferred to raise funds. The lower the Cost of capital, more margin for profit available for shareholders which consequently maximizes the wealth of shareholders and value of the firm.

Now let us understand how the Cost of Capital is calculated?

Computation of cost of capital consists of two important parts:

1. Measurement of specific costs

2. Measurement of overall cost of capital

Measurement of specific Costs refers to the cost of each specific sources of finance like: • Cost of equity • Cost of preference share • Cost of debt • Cost of retained earnings

Cost of Equity: Cost of equity capital is the rate at which investors discount the expected dividends of the firm to determine its share value. Conceptually the cost of equity capital (Ke) defined as the "Minimum rate of return that a firm must earn on the equity financed portion of an investment project in order to leave the market price of the shares unchanged".

Cost of equity can be calculated from the viewpoints of various approach such as:

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

Dividend Price (D/P) Approach: The cost of equity capital will be that rate of expected dividend which will maintain the present market price of equity shares.

Cost of equityKe=DNp

Where, Ke = Cost of equity capital, D = Dividend per equity share Np = Net proceeds per equity share

Now let us understand by an example: A company issues 1,00,000 equity shares of Rs. 10 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.

Let us first calculate Dividend per share , As rate of dividend is 25%, Dividend per share (D) = face value per share Rs. 10 x 25% =Rs. 2.5 per share.

Net proceeds per share = Face Value + Premium

= Rs. 10 + Rs. 1 (10% of Rs. 10 face

value)

=Rs. 11

The cost of equity capital of newly issued shares can be calculated as:

Ke=DNp

=*2.511*×100

= 22.73%

If the market price of an equity share of an existing company is Rs. 20,the cost of equity capital can be calculated as:

Dividend Price Plus Growth (D/P + g) Approach: The cost of equity is calculated on the basis of the expected dividend rate per share plus growth in dividend. It can be measured with the help of a formula:

$$Ke=DNp+g$$

Where, Ke = Cost of equity capital

D = Dividend per equity share

g = Expected Growth in dividend

Np = Net proceeds of an equity share

Now Let us understand with the help of an example:

A company plans to issue 1,00,000 new 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 initially and growth in dividends is expected to be 10%.

For calculating cost of new issue of equity sharelet us first calculate Dividend per share (D) and Net proceeds (Np) per share.

Dividend per share= Face value Rs. 10x10% rate of dividend

= Rs. 1 dividend per share

Net Proceeds per share = Rs. 10 face value – floatation cost Rs. 0.50 ie 5% of Rs. 10

Hence net proceeds per share= Rs. 9.50

Cost of equity, Ke=DNp+g

$$=19.5 \times 100 + 10\%$$

= 10.53 + 10

=20.53%

If the current market price of an existing listed company is Rs. 20

$$Ke = 120 \times 100 + 10\%$$

= 5+10
= 15%

Earning Price (E/P)Approach: Under this approach Cost of equity is based on the future earnings prospects of the equity. The formula for calculating the cost of equity according to this approach is:

$$Ke = ENp$$

Where, Ke = Cost of equity capital

E = Earning per share.

Earning per share can be derived as Total Earnings÷Total number of equity shares

Np = Net proceeds of an equity share

Let us understand calculation of cost of equity under Earning price Approach with the help of an example.

A company issued 1,00,000 equity shares of Rs. 10 each at a premium of Rs. 2 per share. Total earnings for the year was Rs. 5,00,000. Floatation cost per share is Rs. 1.

For calculating the cost of equity under this approach let us first calculate earning per share and net proceeds per share.

Earning per share (E)=Total Earnings ÷ Total no. of equity shares

 $= 5,00,000 \div 1,00,000$

= Rs. 5 per share

Net proceeds per share(Np) = Rs. 10 face value per share+ Rs. 2 premium- Rs. 1 floatation cost= Rs. 11 per share

Now cost of equity, $Ke = 511 \times 100$

= 45.45%

Apart from equity shares the other source of funds is debt. Debt refers to borrowed funds for a fixed period. During the fixed period interest is payable at specified rate and at the end of the period the debt is redeemed or repaid. Now let us discuss what is Cost of Debt and how it is calculated.

Cost of debt is the after tax cost of long-term borrowed funds. Debt may be issued at par, at premium or at discount.

Debt issued at par means, debt is issued at the face value of the debt without any premium or discount.

It may be calculated with the help of the following formula.

Kd = (1 - t) R

Where, Kd = Cost of debt capital t = Tax rate R = Debenture interest rate

If the debt is issued at premium or discount, the cost of debt is calculated with the help of the following formula.

$$\mathsf{Kd} = \frac{1}{Np} (1-t)$$

Where, Kd = Cost of debt capital

I = Annual interest payable

Np = Net proceeds of debenture

t = Tax rate

Let us understand with the help of an example.

(a) If A Ltd. issues Rs. 10,00,000, 8% debentures at par. The tax rate applicable to the company is 50%,

(b) If B Ltd. issues Rs. 1,00,000, 8% debentures at a premium of 10%. The tax rate applicable to the company is 60%,

(c) If C Ltd. issues Rs. 1,00,000, 8% debentures at a discount of 5%. The tax rate is 60%,

(d) If D Ltd. issues Rs. 10,00,000, 9% debentures at a premium of 10%. The costs of floatation are 2%. The tax rate applicable is 50%.

In all cases, we have to compute the after-tax cost of debt as the firm saves on account of tax by using debt as a source of finance.

Cost of debentures for A Ltd. will be

(a) Kd =
$$\frac{1}{Np}(1-t)$$

= $\frac{8,000}{1,00,000}(1-0.5)$
= $\frac{8,000}{1,00,000}(0.5)$
= 4%

Cost of debentures for B Ltd. will be

(b) Kd =
$$\frac{1}{Np}(1-t)$$

N_p = Face value + Premium = 1,00,000 + 10,000
= 110000

$$=\frac{8,000}{1,10,000}(1-0.6)$$

$$=\frac{8,000}{1,10,000}(0.4)$$

= 2.91 %

Cost of debentures for C Ltd. will be

$$(c) Kd = \frac{1}{Np} (1-t)$$

Net proceeds Np will be Face value Rs, 1,00,000 - Discount Rs. 5,000

$$=\frac{8,000}{95,000}(1-0.6)$$

= 3.37%

Cost of debentures for D Ltd. will be

(d)Kda =
$$\frac{1}{Np}(1-t)$$

N_p = 10,00,000 + 10,000 - floatation cost
=11,00,000 - 2% of 11,00,000
= 11,00,000 - 22,000
= 10,78,000
= $\frac{90,000}{10,78,000}(1-0.5)$
= 4.17%

COST OF PERPETUAL DEBT AND REDEEMABLE DEBT:

The cost of perpetual debt is the rate of interest specified at the time of incurring debt or issuing the debentures. While cost of redeemable debt is calculated by the formula of:

$$\mathsf{Kdb} = \frac{I + 1/n(P - N_P)}{1/2(P + N_P)}$$

Where,

I = Annual interest payable P = Par value of debt Np = Net proceeds of the debenture n = Number of years to maturity Kdb = Cost of debt before tax. For calculating Cost of debt after tax the following formula is used Kda=kdb $_{x}$ (1-t) Where, Kda = Cost of debt after tax Kdb = Cost of debt before tax t = Tax rate Let see how it iscomputed. **Example:**A company issues Rs. 10,00,000 10% redeemable

Example:A company issues Rs. 10,00,000 10% redeemable debentures at a discount of 5%. The costs of floatation amount to Rs. 25,000. The debentures are redeemable after 8 years. calculate before tax and after tax. Cost of debt assuring a tax rate of 55%.

Kdb =
$$\frac{I + 1/n(P - N_{P})}{1/2(P + N_{P})}$$

= $\frac{1,00,000 + 1/8(10,00,000 - 9,25,000)}{1/2(10,00,000 + 9,25,000)}$
= $\frac{1,00,000 + 9375}{9,62,500}$
= 11.36%

After Tax Cost of Debt Kdb = Kda (1- t) =11.36 (1-0.55) =5.11%

COST OF PREFERENCE SHARE CAPITAL: Cost of preference share capital refers to the amount which is payable to the preference shareholders inform of dividend at a fixed rate. There are two types of preference shares irredeemable and redeemable. Cost of irredeemable preference share is calculated by formula of:

$$K_p = \frac{Dp}{Np}$$

Where,

Kp = Cost of preference share

Dp = Fixed preference dividend

Np = Net proceeds of an equity share

Cost of redeemable preference share is calculated in the following manner:

$$\mathsf{K}_{\mathsf{p}=}\frac{Dp + (P - Np)/n}{(P + Np)/2}$$

Where,

Kp = Cost of preference share

Dp= Fixed preference share

P = Par value of debt

Np = Net proceeds of the preference share

n = Number of maturity period.

Example: A company issues 20,000, 8% preference shares of Rs. 100 each. Cost of issue is Rs. 2 per share. Calculate cost of preference share capital if these shares are issued (a) at par, (b) at a premium of 10% and (c) at a discount of 6%.

Solution:

Cost of preference share capital
$$K_p = \frac{Dp}{Np}$$

(a) At par $= \frac{1,60,000}{20,000 - 40,000} X100 = 8.16\%$

(b)At a premium of 10% =
$$\frac{1,60,000}{20,00,000 + 2,00,000 - 40,000} X100$$

=7.40%
(c)At a discount of 6% = $\frac{1,60,000}{20,00,000 - 1,20,000 - 40,000} X100$
=8.69%

Let us see an Example of computing cost of redeemable preference share.

A Ltd. issues 10,000, 8% preference shares of Rs. 100 each redeemable after 8 years at a premium of 10%. The cost of issue is Rs. 2 per share. Calculate the cost of preference share capital.

Solution:

$$\begin{split} \kappa_{p=} \frac{Dp + (P - Np)/n}{(P + Np)/2} \\ \text{where Dp} &= 10,000 \times 100 \times 8\% = 80,000 \\ P &= 10,00,000 + 1,00,000 = 11,00,000 \\ \text{Np} &= 10,00,000 - 20,000 = 9,80,000 \\ \text{n} &= 8 \text{ years} \end{split}$$

 $=\frac{80,000 + (11,00,000 - 9,80,000)/8}{(11,00,000 + 9,80,000)/2}$

= <u>95,000</u> = <u>10,40,000</u>

Now let see the Cost of Retained Earnings: When company invests profits retained in the business it utilizes that part of profit which is not distributed amongst the shareholders hence it does not involve any explicit cost in terms of dividend or interest payment as involved in other sources of income but it does have a cost which is measured as the return the shareholder had forgone by not investing his share of earnings elsewhere.

K = K (1 - t) (1 - b)

Where, Kr=Cost of retained earnings Ke=Cost of equity t=Tax rate b=Brokerage cost

Let see an example: A firm's Ke (return available to shareholders) is 10%, the average tax rate of shareholders is 30% and it is expected that 2% is brokerage cost that

shareholders will have to pay while investing their dividends in alternative securities. What is the cost of retained earnings?

Solution

Cost of Retained Earnings, Kr = Ke(1 - t)(1 - b)

Where, Ke = rate of return available to shareholders

t = tax rate

So,

b = brokerage cost Kr = 10% (1-0.5) (1-0.02)= $10\% \times 0.5 \times 0.98$

= 4.9%

The next topic of our discussion is Weighted Average Cost of Capital: Weighted average cost of capital which is also referred as combined or composite cost of capital is the weighted average of the specific costs of different sources of capital where each source of capital is assigned a weight according to its relative share in capital structure of the company.

The computation of the overall cost of capital (Ko) involves certain steps.

(a) Assigning weights to specific costs.

(b) Multiplying the cost of each of the sources by the appropriate weights.

(c) Dividing the total weighted cost by the total weights. The overall cost of capital can be calculated with the help of the following formula;

Ko= Kd Wd + Kp Wp + Ke We + Kr Wr

Where, Ko = Overall cost of capital

- Kd = Cost of debt
- Kp = Cost of preference share
- Ke = Cost of equity
- Kr = Cost of retained earnings

Wd= Percentage of debt of total capital

Wp = Percentage of preference share to total capital

We = Percentage of equity to total capital

Wr = Percentage of retained earnings

Weighted average cost of capital is calculated with the help of formula also:

$$\mathsf{K}_{\mathsf{w}} = \frac{\sum XW}{\sum W}$$

Where,

Kw = Weighted average cost of capitalX = Cost of specific sources of financeW = Weight, proportion of specific sources of finance.

Example: The following is the capital structure of a company

Debentures of Rs. 100 each	10,00,000	
Red. Preference shares of Rs. 100 each	4,00,000	
Equity shares of Rs. 10 each	15,00,000	

The market price of the sources is as follows:

a) Market price of Debenture is Rs.105

b) Market price of Preference share is Rs.120

c) Market price of Equity shares is Rs. 20

The specific cost of each of it is as follow:

Source of capital	Specific cost (%)
Debenture	5
Preference share	10
Equity	15

Solution:

Source of capital	Amount	Cost(%)	Weighted cost (XW)
Debenture	10,00,000	5	50,000
Preference share	4,00,000	10	40,000
Equity	15,00,000	15	2,25,000
	∑W=29,00,000		∑XW=3,15,000

Weighted Average cost of capital $K_w = \frac{\sum XW}{\sum W}$

 $=\frac{3,15,000}{29,00,000}\times100$ =10.86%

Last topic of today's session is Marginal Cost of Capital: Marginal cost is the weighted average cost of new finance raised by the company. It is the additional cost of capital when the company goes for further raising of finance.

Summary

To we discussed what are financial decision, What is cost of capital, what is relationship between financing decision and cost of capital and how the cost of capital is calculated for various sources of funds.