**UNIT 5 - COST OF CAPITAL**

# INTRODUCTION

Cost of capital is an integral part of investment decision as it is used to measure the worth of investment proposal provided by the business concern. It is used as a discount rate in determining the present value of future cash flows associated with capital projects. Cost of capital is also called as cut-off rate, target rate, hurdle rate and required rate of return. When the firms are using different sources of finance, the finance manager must take careful decision with regard to the cost of capital; because it is closely associated with the value of the firm and the earning capacity of the firm.

## 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. 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 the shareholders.

## 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.

According to the definition of 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”.

According to the definition of **William and Donaldson**, “Cost of capital may be defined as the rate that must be earned on the net proceeds to provide the cost elements of the burden at the time they are due”.

# CLASSIFICATION OF COST OF CAPITAL

Cost of capital may be classified into the following types on the basis of nature and usage:

* + Explicit and Implicit Cost.
	+ Average and Marginal Cost.
	+ Historical and Future Cost.
	+ Specific and Combined Cost.

## Explicit and Implicit Cost

The cost of capital may be explicit or implicit cost on the basis of the computation of cost of capital.

Explicit cost is the rate that the firm pays to procure financing

Implicit cost is the rate of return associated with the best investment opportunity for the firm and its shareholders that will be forgone if the projects presently under consideration by the firm were accepted.

## Average and Marginal Cost

Average cost of capital is the weighted average cost of each component of capital employed by the company. It considers weighted average cost of all kinds of financing such as equity, debt, retained earnings etc.

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.

## Historical and Future Cost

Historical cost is the cost which as already been incurred for financing a particular project. It is based on the actual cost incurred in the previous project.

Future cost is the expected cost of financing in the proposed project. Expected cost is calculated on the basis of previous experience.

## Specific and Combine Cost

The cost of each sources of capital such as equity, debt, retained earnings and loans is called as specific cost of capital. It is very useful to determine the each and every specific source of capital.

The composite or combined cost of capital is the combination of all sources of capital. It is also called as overall cost of capital. It is used to understand the total cost associated with the total finance of the firm.

# IMPORTANCE OF COST OF CAPITAL

Computation of cost of capital is a very important part of the financial management to decide the capital structure of the business concern.

## Importance to Capital Budgeting Decision

Capital budget decision largely depends on the cost of capital of each source. According to net present value method, present value of cash inflow must be more than the present value of cash outflow. Hence, cost of capital is used to capital budgeting decision.

## Importance to Structure Decision

Capital structure is the mix or proportion of the different kinds of long term securities. A firm uses particular type of sources if the cost of capital is suitable. Hence, cost of capital helps to take decision regarding structure.

## Importance to Evolution of Financial Performance

Cost of capital is one of the important determine which affects the capital budgeting, capital structure and value of the firm. Hence, it helps to evaluate the financial performance of the firm.

## Importance to Other Financial Decisions

Apart from the above points, cost of capital is also used in some other areas such as, market value of share, earning capacity of securities etc. hence, it plays a major part in the financial management.

# COMPUTATION OF COST OF CAPITAL

Computation of cost of capital consists of two important parts:

1. Measurement of specific costs
2. Measurement of overall cost of capital

## Measurement of Cost of Capital

It refers to the cost of each specific sources of finance like:

* + Cost of equity
	+ Cost of debt
	+ Cost of preference share
	+ 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 unchanged the market price of the shares”.

Cost of equity can be calculated from the following approach:

* + Dividend price (D/P) approach
	+ Dividend price plus growth (D/P + g) approach
	+ Earning price (E/P) approach
	+ Realized yield approach.

## Dividend Price Approach

The cost of equity capital will be that rate of expected dividend which will maintain the present market price of equity shares.

Dividend price approach can be measured with the help of the following formula:

p

N

e

K = D

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

100

= 22.72%

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

K  D

e Np

 = $\frac{25}{175}100$ =14.28%

## Dividend Price Plus Growth 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 the following formula:

p

N

e

K  D  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

1. 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.
2. If the current market price of an equity share is Rs. 120. Calculate the cost of existing equity share capital

## Solution

1. Ke= D +g

Np

= 12 +5=17.5%

100  4

1. Ke= D + g

Np

= 12 +5%=15%

120

## 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%.

Ke =

 D + g

N p

## Earning Price Approach

= 4.50 × 100 + 7%

95

= 4.73% + 7% = 11.73%

Cost of equity determines the market price of the shares. It is based on the future earning prospects of the equity. The formula for calculating the cost of equity according to this approach is as follows.

p

N

 E

e

K

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 = E

Np

Earnings Per Share(EPS) = 100 lakhs

10 lakhs

Ke = 10 × 10

100

= 10%

= Rs.10

Cost of Equity Capital

Ke =

=

 E N P

 10

92  2

× 100

= 11.11%

## Realized Yield Approach

It is the easy method for calculating cost of equity capital. Under this method, cost of equity is calculated on the basis of return actually realized by the investor in a company on their equity capital.

Ke  PV*f*×D

Where,

Ke = Cost of equity capital.

PV*ƒ* = Present value of discount factor. D = Dividend per share.

## Cost of Debt

Cost of debt is the after tax cost of long-term funds through borrowing. Debt may be issued at par, at premium or at discount and also it may be perpetual or redeemable.

## Debt Issued at Par

Debt issued at par means, debt is issued at the face value of the debt. 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

## Debt Issued at Premium or Discount

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

Where,

I

Kd = Np (1 – t)

Kd = Cost of debt capital

I = Annual interest payable Np = Net proceeds of debenture

t = Tax rate

## Exercise 5

1. A Ltd. issues Rs. 10,00,000, 8% debentures at par. The tax rate applicable to the company is 50%. Compute the cost of debt capital.
2. B Ltd. issues Rs. 1,00,000, 8% debentures at a premium of 10%. The tax rate applicable to the company is 60%. Compute the cost of debt capital.
3. A Ltd. issues Rs. 1,00,000, 8% debentures at a discount of 5%. The tax rate is 60%, compute the cost of debt capital.
4. B 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%. Compute the cost of debt-capital.

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

## Solution

* 1. Kda = I (1–t)

 Np

(b) Np = Face Value + Premium = 1,00,000+10,000=1,10,000

= 8,000

1,10,000

= 8,000

1,10,000

= 2.91%

× (1 – 0.6)

× 0.6

(c) Kda = I

Np

(1 – t)

= 8,000 × (1 – t)

 95,000

= 3.37%

## Cost of Perpetual Debt and Redeemable Debt

It is the rate of return which the lenders expect. The debt carries a certain rate of interest.

Kdb =

I  1 / n(P  N p )n 1/ n(P  Np )/ 2

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.

Cost of debt after tax can be calculated with the help of the following formula:

K d a= K d b×(1–t)

Where,

Kda = Cost of debt after tax Kdb = Cost of debt before tax

t = Tax rate

## Exercise 6

A company issues Rs. 20,00,000, 10% redeemable debentures at a discount of 5%. The costs of floatation amount to Rs. 50,000. The debentures are redeemable after 8 years. Calculate before tax and after tax. Cost of debt assuring a tax rate of 55%.

## Solution

Kdb =

=

I  1/n (P  Np ) 1 2(P  Np)

20,00,000  1/8(20,00,000  18,50,000)

1 2(20,00,000  18,50,000)

Note Np = 20,00,000 – 10,00,000 – 50,000

2,00,000  18750

= 19,25,000

After Tax Cost of Debt Kdb

= 11.36%.

= Kda (1 – t)

=11.36 (1– 0.55)

=5.11%.

## Cost of Preference Share Capital

Cost of preference share capital is the annual preference share dividend by the net proceeds from the sale of preference share.

There are two types of preference shares irredeemable and redeemable. Cost of redeemable preference share capital is calculated with the help of the following formula:

p

N

 Dp

p

K

Where,

Kp = Cost of preference share Dp = Fixed preference dividend

Np = Net proceeds of an equity share

Cost of irredeemable preference share is calculated with the help of the following formula:

p

(P  N )/2

 Dp  ( P  N p )/n

p

K

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.

## Exercise 7

XYZ Ltd. 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) of a debentures of 6%.

## Solution

D

Cost of preference share capital Kp = p

N

1. Kp =

p

 1,60,000

20,00,000  40,000

×100

= 8.16%

(b) Kp = 1,60,000 20,00,000  2,00,000  40,000

= 7.40%

× 100

I Kp = 1,60,000 ×100

20,00,000  1,20,000  40,000

= 1,60,000 ×100

18,40,000

= 8.69%

## Exercise 8

ABC Ltd. issues 20,000, 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.

p

(P  N )/2

 Dp  ( P  N p )/n

p

K

= 1,60,000  1/8 (22,00,000  19,60,000)

1/ 2(22,00,000  19,60,000)

= 1,60,000  30,000

20,80,000

= 9.13%

where Dp = 20,000×100×8%=1,60,000

P = 20,00,000+2,00,000 =22,00,00

Np = 20,00,000 – 40,000 =19,60,000

n = 8 years

## Exercise 9

ABC Ltd. issues 20,000, 8% preference shares of Rs. 100 each at a premium of 5% redeemable after 8 years at par. The cost of issue is Rs. 2 per share. Calculate the cost of preference share capital.

## Solution

p

(P  N )/2

 Dp  ( P  N p )/n

p

K

= 1,60,000  1/8 (20,00,000  20,60,000)

1/2 (20,00,000  20,60,000)

= 1,60,000 – 7,500

20,30,000

= 7.51%

where Dp = 20,000×100×8%=1,60,000 P = 20,00,000

n = 8 years

Np = 20,00,000 + 10,00,000 – 40,000 =20,60,000