Financial Management: Cost of Capital

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Meaning of Cost of Capital

The cost of capital is an opportunity cost of making a specific investment. It is the rate of return required to be paid to investor for making investment. Whenever, the finance manager collects capital from different sources he is required to pay a cost or return to the owner of each source of fund, this payment from the part of business to the investors of fund is termed cost of capital for the business.

Component Cost and Weighted Average Cost of Capital (WACC)

Component Cost of Capital

A company collects long term capital from different sources. For each source it pays a return to its investor. This cost payable to each of the sources is known as component cost of capital. Following are the possible components of capital:

1. Equity Capital
2. Preference capital
3. Debt
4. Retained earnings

Weighted Average Cost of Capital (WACC)

The above component's cost of capital is available in the capital structure of the company in different proportion constituting the total capital of the company. On the basis of the proportion (also known as weight) of each component and its respective cost, the average cost of capital is computed. This average cost of capital is known as Weighted Average Cost of Capital (WACC). It is this weighted average cost of capital which is the opportunity cost or the minimum required rate of return or the discount rate attributable to the overall capital of the company.

Significance of Weighted Average Cost of Capital

1. WACC gives an idea about the opportunity of cost of overall capital in the capital structure.
2. With the help of the WACC the decision acceptability decision of a given project is taken.
3. It is helpful in optimizing the capital structure of the company.
4. WACC is also helpful in overcoming the risk factors involved in capital budgeting.
5. WACC guides the company in profit planning and maximizing the interest of shareholders.

Computation of components' Cost of Capital

Cost of Debt

Debt is a fixed cost fund. The rate of interest on debt is mentioned. For the business employing debt into its capital structure, the benefit of tax is available. This benefit is adjusted in the rate of interest payable on debt fund. The tax adjustment since is beneficial for the company, the effective cost of capital after tax tends to fall. Another thing we need to incorporate in the cost of debt is its duration. It means we should know whether the debt is perpetual or redeemable after a period of time.

Cost of Irredeemable or perpetual debt

$K_d = I \times (1-t)/P$ or NP

Where,
K_d =after tax cost of debt
I= the rate of interest payable on debt
t= the tax rate
P = Price, NP= Net Proceed

Question 1

X Ltd issues 15 percent irredeemable debentures of 100 each. Tax rate is 35 percent. Determine after tax cost of debt assuming it is issued at (a) face/par value, (b) 10 percent premium and (c) 10 percent discount.

Solution

When issued at face/par value:

K_d = I x (1-t)/P = 15 x (1-0.35)/100 =15x0.65/100 = 9.75/100 = 9.75% (Answer)

When issued at 10 percent premium:

K_d = I x (1-t)/NP = 15 x (1-0.35)/100+10 =15x0.65/110 =9.75/110 =8.86% (Answer)

When issued at discount:

K_d = I x (1-t)/NP = 15 x(1-0.35)/100-10 =15 x0.65/90 =9.75/90 = 10.83% (Answer)

Cost of Redeemable or Perpetual Debt

$K_d = [I \times (1-t) + (RV- NP)/n]/(RV+NP)/2$

Where,

K_d =after tax cost of debt

I= the rate of interest payable on debt

t= the tax rate

RV = Redeemable Value

NP= Net Proceed

n=No. of years after which the debt is payable

Question 2

A Ltd issues 15% debentures with par value of 100. The debentures are payable after 7 years at face value. The expenses involved in the issue of debentures are 3% of face value. Tax rates are 35%. You are required to calculate the cost of debentures.

Solution:

$K_d = [I \times (1-t) + (RV- NP)/n]/(RV+NP)/2$

$= [15 \times (1-0.35) + (100-97)/7]/(100+97)/2$

$= [(15x0.65)+0.43]/197/2$

$= 10.18/98.5$

$=10.33\%$ (Answer)

Cost of Preference Share Capital

Preference share capital is owners' capital with the difference from equity capital that in preference share rate of dividend is fixed. Preference share capital may be redeemable and irredeemable. The computation of preference share capital is done as follows:

Computation of Irredeemable Preference Share Capital

$K_p = D/NP$

Where,

K_p=cost of preference share

D=Dividend payable on preference share

NP= Net proceed

Question 1

X Ltd issues 12 percent perpetual preference shares with the par value of 150 each. Compute the cost of preference shares.

Solution:

K_p= D/NP = 18/150 =0.12 or 12% (Answer)

Question 2

A Ltd issues 14 percent irredeemable preference shares with the face value of 200. The flotation cost is 5 percent. Compute the cost of preference shares.

Solution:

K_p= D/NP =28/190=0.1474 or 14.74% (Answer)

Question 3

SR Ltd is planning to issue 14 percent perpetual preference shares with the face value of 100. Flotation cost is estimated to be 4 percent. Compute the cost of preference shares if they are issued:

1. at face value;
2. at premium of 10 percent;
3. at discount of 5 percent;

Solution:

If preference shares are issued at face value:

K_p= D/NP =14/96=0.1458 or 14.58% (Answer)

If preference shares are issued at 10 percent premium:

K_p= D/NP = 14/100-4+10 =14/106=0.1321 or 13.21% (Answer)

If preference shares are issued at 10 percent discount:

K_p= D/NP = 14/100-4-5 =14/91=0.1538 or 15.38% (Answer)

Computation of Redeemable Preference Share Capital

$K_p = [D+(RV-NP)/n]/(RV+NP)/2$

Where,

K_p= Cost of redeemable preference shares

D=Dividend payable on preference share

RV= Redeemable Value

NP= Net Proceeds

n = No. of years

Question 1

A Company issues 1,00,000, 10 percent preference shares of 100 each redeemable after 10 years. The cost of issue is 10 percent. Find out the cost preference shares if they are:

1. Issued at par and redeemable at par;
2. Issued at par and redeemable at 10 percent premium
3. Issued at 8 percent discount and redeemable at 10 percent premium

Solution:

If the preference shares are issued at par and redeemable at par

K_p= [D+(RV-NP)/n]/(RV+NP)/2

=[10+(100-90)10]/(100+90)/2 =[10+1]/190/2 =11/95=0.1158

=or 11.58% (Answer)

If the preference shares are issued at par and redeemable at 10 percent premium:

K_p= [D+(RV-NP)/n]/(RV+NP)/2

= [10+(110-90)/10]/(110+90)/2 =[10+2]/100=12/100=0.12 or 12% (Answer)

If the preference shares are issued at 8 percent discount and redeemable at 10 percent premium:

K_p= [D+(RV-NP)/n]/(RV+NP)/2

= [10+(110-82)/10]/(110+82)/2 =(10+2.8)/96 =0.1333 or 13.33% (Answer)

Cost of Equity Capital and Cost of Retained Earnings

Equity capital is owners' capital. The entire profit after tax (PAT) earned by the business at the end of the year is considered to belong to equity shareholders. Since, companies take a decision to distribute a part of this profit to shareholders as dividend and rest of the profits are retained internally in the business. Retained earnings belong to shareholders. Company can issue fresh capital or use internal retained earnings to finance its projects. Under both the methods cost of capital is same.

Approaches to calculate cost of equity

Following approaches are used to calculate the cost of equity capital:

Dividend capitalization approach: Under this method, dividend distributable to shareholders becomes the basis for calculating the cost of equity capital.

K_e= D/NP or MP

Where,

K_e= Cost of equity

D= Dividend per share distributable to shareholders

NP= Net proceed

MP= Market price of the share

Question 1

ABC Ltd is issues 12,000 equity shares at a discount of 10 percent. The par value of the share is 100. Flotation cost in the issue of equity shares is 10 percent. The company is expected to pay a dividend of 8 per share. Calculate the cost of equity share.

Solution

K_e= D/NP or MP = 8/100-10-10 =8/80 = .01 or 10% (Answer)

Earnings capitalization approach

According to this approach the cost of equity capital is calculated on the basis of earning per share (EPS) and current market price or the net proceed.

K_e= EPS/NP or MP

Where,

Ke = Cost of Equity

EPS= Earnings per share

NP= Net proceed

MP= Current market price of share

Question 2

Y Co. Ltd is currently earning 15 percent operating profit on its share capital of 20 lakh. Face value of each share is 200. The company is interested to go for an expansion programme for which it needs an additional share capital of 10 lakh. Company issues these additional shares with 10 percent premium and incurs 5 percent flotation cost. You are required to calculate the cost of equity capital after the additional share capital assuming that rate of earning of the co. is unaffected.

Solution:

Cost of Capital before the additional issue:

K_e=EPS/NP or MP =30/200+20-10 =30/210=0.1429 or 14.29% (Answer)

Working Notes:

Calculation of EPS:

Operating Profits= 20+10 =30x0.15=4.5lakh

No. of equity shares=30,00,000/200=15,000

EPS=Operating profits/No. of Equity shares=4,50,000/15,000= 30

Calculation of Net Proceeds (NP):

Face Value+ Premium- Flotation Cost =200+20-10= 210

Question 3

A firm is currently earning 50 lakh and its share selling at a market price of 140. The firm has 1,00,000 shares outstanding. Compute the cost of equity.

Solution:

K_e= EPS/NP or MP = 50/140=0.3571 or 35.71% (Answer)

Dividend Capitalization and Growth Rate Approach

Computation of cost of capital on the basis of fixed dividend may not appropriate as the dividend over the years tend to grow. The growth in dividend may be constant rate or may grow over the years. Whatever is the case, with the given growth rate the cost of capital would be calculated as follows:

K_e= D/NP or MP +G

Where,

K_e=Cost of equity

D=dividend payable

NP = Net Proceed

G= Growth Rate

Question 4

Equity share of a company is currently selling for 100. It wants to finance its capital expenditure of 20 lakh either by retaining earnings or by selling new shares. If company wants to sell the shares, the issue price would be 95. The expected dividend next year is 4.75 per share and it is expected to grow at 6 percent perpetually. Calculate the cost of equity capital internally and externally.

Solution:

Cost of equity internally means that the project is being financed by internally through the retention of earnings. In that case, the dividend would be divided by market price and growth rate would be added to find out the cost of equity capital.

K_e= D/MP+G = 4.75/100+0.06 =0.0475+0.06= 0.1075 or 10.75% (Answer)

Cost of equity externally means that the project is being financed through the issue of share capital and not through the retention of earnings. In that case, the dividend would be divided by net proceed and then growth rate would be added to find out the cost of capital.

K_e= D/MP+G = 4.75/95+0.06 =0.05+0.06= 0.11 or 11% (Answer)

Cost of Retained Earnings

Retained earnings are available within the company in the form reserves after distributing dividends to the shareholders. Retained earnings represent cumulative earnings of a business firm since its' inception. The same retained earnings are plowed back into the firm's growth by becoming a part of its' capital structure. Retained earnings are also known as capitalized profits. The cost of retained earnings is the opportunity cost of shareholders and is calculated same as we calculate the cost of retained earnings.

K_{re}= D/MP+G

Where,

K_{re}= Cost of Retained Earnings

D= Dividend payable on shareholders

G= growth rate in the dividend

Question 1

Company X has 10 lakh of retained earnings. It has a projected dividend of 6.75 per share next year and the growth rate in dividend is 7 percent. The market price of share is 150. What would be the cost of retained earnings?

Solution:

K_{re}= D/MP+G =6.75/150+.07 =.045+.07=0.115 or 11.5% (Answer)

Calculation of Weighted Average Cost of Capital (WACC)

Weighted Average Cost of Capital (WACC) is aggregated average cost of the entire capital structure of a given concern. WACC is calculated by multiplying the specific cost of a component with its respective weight then all these amounts are added up, the resulting figure is WACC.

$WACC= W^1C^1+W^2C^2+W^3C^3+…..W^n C^n$

Where,

WACC= Weighted Average Cost of Capital

$W^1, W^2, W^3 … W^n$ =Weights of different Component's of Capital

$C^1, C^2, C^3 … C^n$ = Costs of different Component's of Capital

Cost of Capital: Component & WACC

Question 1:

Hindustan Chemicals Limited has its capital structure consisting of Equity, preference and debt capital detailed as below:

1. Equity share Capital:

6,00,000 equity shares of Rs. 10 each. The current market price of share is Rs. 24. During the current year, the company has declared a dividend of Rs. 6 per share.

2. Preference share capital:

14% preference shares of Rs. 10 each aggregating Rs. 30,00,000. The company has received only 95% of the face value of preference shares after deducting issue expenses.

3. Debenture Capital

13% 50,000 debentures of Rs 100 each amounting to 50,00,000

The company's corporate tax rate is at 40%. The growth in dividends on equity shares is expected at 5%. You are required to calculate:

a) Cost of capital if each component
b) WACC of the company.

Solution: Computation of Components' Costs and Weighted Average Cost of Capital (WACC)

Cost of Equity:

$$Ke = \frac{D}{MP} + \text{Growth Rate}$$

Where:

Ke= cost of equity capital

D= dividend paid by the company

MP= market price of equity share

Growth rate = % growth in profit and dividend

Therefore, cost of equity is calculated as:

Ke= 6/24+0.0=.25+.05=.3 or 30% (Answer)

Cost of preference share capital

Kp= D/NPx100

Where,

Kp= Cost of preference share

D=Dividend payable on preference share

NP= Net Proceed

Therefore, Cost of Preference share is:

Kp= D/NPx 100

=1.4/9.5 x100 =14.74% (Answer)

Cost of Debenture

Kd= I (1-t)

Where,

Kd= Cost of debt after tax

I= Rate of Interest on debt

t=Rate of tax

Therefore, cost of debt is:

Kd=13x(1-0.4)= 13x0.6=7.8% (Answer)

Weighted Average Cost of Capital

Capital	Amount ( )	Weight (%)	Cost of Capital (CC)	WACC (w x cc)
Equity Capital	60,00,000	42.86	0.30	12.86
14% Preference Share Capital	30,00,000	21.43	0.1474	3.16
15% Debentures	50,00,000	35.71	.078	2.78
Total	1,40,00,000	100		18.8