COST OF CAPITAL (MAF) - AA32

Concepts in Sources of Capital and Cost of Capital

Sources of Capital

All organizations need capital for their operations. Capital needed can be obtained by two ways:

1. Long Term Capital
2. Short Term Capital

In this subject area Long Term Capital is discussed. The fundamental rule is to finance a long term investment with Long Term Capital. Long Term Capital is needed to finance Non Current Assets which have a useful life of more than one year .Eg Purchase of a Plant and Machinery, purchase of a building etc.

Long term Capital	Source of Long Term Capital	Method of Obtaining
Equity Share Capital(Ordinary Share Capital)	Issue of Ordinary Shares	• At Initial Public Offer • Rights Issue • Share Option Schemes.
Preference Share Capital	Issue of Preference Shares	• At Initial Public Offer
Debt Capital	Debenture issue	• At Public Offer • Placements

Therefore, in raising Long Term Capital through these sources, the company has to pay a Return to Ordinary Share Holders, Preference Share Holders and Debt providers.

For each Sources of Capital, the return is called as follows:

Sources of Capital	Name of the Return
Ordinary Share Capital	Dividends
Preference Share Capital	Preference Dividends
Debt Capital	Loan Interest, Bond Interest, Debenture Interest

Therefore, in obtaining the Long Term Capital from Sources of Ordinary Shares, Preference Shares, Debentures and Debt Capital, the cost that a company has to pay as Dividends, Interest is called Cost of Capital. A company needs to calculate this Cost of Capital because the return that the company expects by investing the Long Term Capital should exceeds the Cost of Capital.

Therefore a Cost of Capital has two meanings:

1. The **rate of Return** (%) that investors expect to be paid for putting the funds into the company.
2. The **minimum rate of return** (%) that a company should make from its own investment

Therefore, the company uses this minimum rate of return as the discounting factor in investment appraisals.

For each sources of capital their respective cost of capital and the symbol used is give as follows,

Sources of Capital	Cost of Capital	Symbol
Ordinary share capital	Cost of equity	r_e
Preference share capital	Cost of preference Share capital	r_p
Debt Capital	Cost of Debt Capital	r_d

Cost of Capital	Options of estimating Cost of Capital	Assumptions in each option	Formula for Valuation
Cost of equity (Cost of Ordinary share capital)	Dividend Valuation Model Dividend Growth Model(Gordon's Growth Model) Capital assets pricing Model.(CAPM)	Pl see Note A. Pl see Note B.	$r_{e=\frac{d0}{p_0}}$ $r_{e=\frac{d_1}{p_0}}+g$ $r_e = R_f + \beta(R_m - R_f)$

Assumptions
Note A - Dividend valuation model
1. The current market price of share is equal to the present value of the future dividends.
2. A constant dividend is paid for perpetuity.
3. No tax payments.
4. No growth in dividends.
5. Total profit is paid out as dividends (No retention).
   $p_0 = Current\ market\ price\ of\ the\ share$
   $d_0 = Expected\ annual\ dividend\ per\ share$
   $r_e = Cost\ of\ equity$

Note B - Dividend growth model
1. The current market price of share is equal to the present value of the future dividends.
2. Dividend payment will grow at a constant rate for perpetuity.
   $p_0 = Current\ market\ price\ of\ the\ share$
   $d_0 = Expected\ annual\ dividend\ per\ share$
   $r_e = Cost\ of\ equity$
   $g = Dividend\ growth\ rate$

$$d_1 = Last\ annual\ dividend\ paid\ per\ share + dividend\ growth\ rate$$
$$d_0(1 + g)$$

Cost of Preference Share Capital

This is the rate of return required by the preference share holder.

Assumptions in valuation
1. The company will pay constant dividends to preference share holders.
2. There is no growth in dividend

A company may issue two categories of preference shares,
1. Irredeemable preference shares.
2. Redeemable preference shares.

Cost of Irredeemable Preference share.
The computation is same as the dividend valuation model. Therefore, the formula is

$$r_p = \frac{d}{p_0}$$

Where,
d = Annual preference dividend per preference share
p_0= Current market price per preference share (Ex- div price)
r_p=Cost of preference share capital

Cost of Redeemable Preference share.
Since the preference shares are redeemable, the share holder will receive the dividend payment until the year of redemption and the redemption amount to be paid to him. Therefore, IRR method is used to calculate the cost of redeemable preference share.

Cost of Debt Capital.

This is the rate of return required by the providers of Debt Capital.
This can be analyzed in two ways,
1. Cost of debt capital with no market value. Calculated by ,
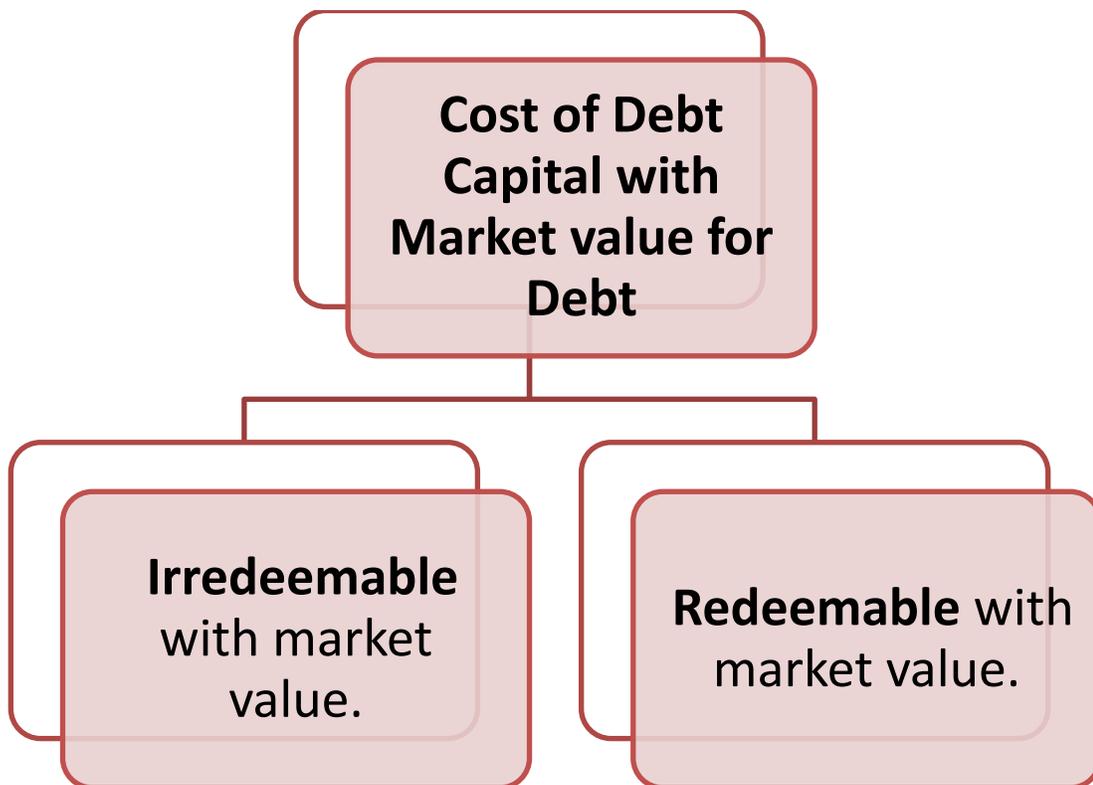$$r_d = k(1 - t)$$
Where,
r_d= Cost of Debt
K = Annual interest per debt
t = Corporate tax rate

2. Cost of debt capital with market value

Cost of Debt Capital with Market value for Debt

Irredeemable with market value.

Redeemable with market value.

It is calculated by,

$$r_d = \frac{k(1-t)}{p_0}$$

r_d= Cost of Debt
K = Annual interest per debt
t = Corporate tax rate
p_0= market value per debenture

It is calculated by IRR method

1. **If the company is assessing the cost of debt capital,**

   Cash outflows are,
     1 interest paid.
     2 redemption of debenture.
   Cash inflows are,
     1 Issue of debenture.

2. **If the investor is assessing the cost of debt capital,**
   Cash outflows are,
     1 purchase of debenture.
   Cash inflows are,
     1 interest received.
     2 redemption of debenture.

WACC – This is the combined rate of return of the debt and equity capital. A project may be financed by either by equity or debt or both. Therefore WACC is the average cost of

sources of finance where each source of finance is weighted by the total sources of capital.

WACC is computed as follows,

$$WACC = \left(r_e * \frac{E}{E+P+D} \right) + \left(r_p * \frac{P}{E+P+D} \right) + \left(r_p * \frac{D}{E+P+D} \right)$$

Method of Weighing WACC.

- **Book value method –** Here the book value of all sources of capital is taken.
- **Market value method-** Here the market value of all sources of capital is taken except for retained earnings. Retained Earnings value is not taken for calculation.

Assumptions in WACC.
1. The capital structure of an entity will remain unchanged.
2. Any new capital investment will have a similar risk profile to existing investments.

Questions and Solutions related to the topic.

Q1.The following information is related to JT Company PLC (JT) as at 31st December 2015:
- Issued share capital of JT is Rs.500 million and it comprises with 1,000,000 ordinary shares. JT is a quoted company and its current share price is Rs. 250/-. The dividend paid for the current year was Rs. 40/- per share and growth rate of annual dividend payment is 5%.
- The retained earnings of JT were Rs.100 million.
- JT has issued irredeemable preference shares for a value of Rs. 150 million. This consists of 500,000 preference shares and annual dividend per share is Rs. 25/-. The last traded price of a preference share was Rs.250/-.
- Irredeemable, non-quoted long term borrowings of JT were Rs.150 million with annual interest rate of 17%. The company pays income tax at the rate of 28% per annum on its profits.

- Compute the following:
  - (i)   Cost of ordinary share capital.
  - (ii)   Cost of preference share capital.
  - (iii)   Cost of debt.
  - (iv)   Weighted average cost of capital (WACC)at market values
- State two(02) assumptions in WACC as the discounting factor in investment appraisals .

Solution

(i) **Cost of ordinary share capital**. (That is re)

Dividend per share is Rs40/=.   (do=Rs40/=)

Market price of a share is Rs 250 =. (Po=Rs250/)

Growth rate is 5% p.a   (g=5%)

Accordingly,

$d1=do+g$

   $=40+5\%$

$re=d1/po + g$

 $= (40+5\%)/250+5\%$

$=$ 16.8%   +5%

$=$ 21.8%

(ii) **Cost of preference share capital**.

These Preference shares are irredeemable.
Therefore, the formula should be $rp=d/po$

Accordingly, d=Rs25/00, po =Rs250/00

$Rp = 25/250$

   $=10\%$

Cost of debt.
These debt are irredeemable with no market value.

Therefore, the formula is $rd =k(I-t)$
          17% (1 -28%) = 12.24% (t=28%,interest rate =17%

(iv) WACC.

	Market value	weight	Cost of Capital	WACC
Ordinary Share Capital				
1,000,000 * 250 =	250 Mn	48%	21.8%	10.46%
Preference Share Capital				
500,000 * 250 =	125Mn	24%	10%	2.40%
DEBT =	150Mn	28%	12.24%	3.42%
	525Mn	100		16.28%

        WACC=16.28%

(b)Assumptions
      1. The capital structure of an entity will remain unchanged.
      2. Any new capital investment will have a similar risk profile to existing investments.

Q2. Tandy plc.a quoted company in the Colombo Stock Exchange provides the following information :

(1) Tandy PLC has 100 million ordinary voting shares currently trading at Rs.25 per share. Dividend is paid at Rs.1.60 per share.

(2) The company has 5 million debentures listed in the Colombo Stock Exchange with a par value of Rs.100/- per debenture. These debentures are redeemable in 3 years and the debentures were issued at an interest rate of 15% per annum. The debentures are currently trading at Rs.95/= per debenture.

The tax at the rate of 28% per annum on its profits.

Calculate,
(a) Cost of Ordinary Share Capital.
(b) Cost of Debenture Capital.
(c) Weighted Average Cost of Capital (WACC) using the Market Value.

Solution

(a) Cost of ordinary share capital. (That is re)

Dividend per share is Rs1.60/=.   (do=Rs1.60/=)

Market price of a share is Rs 25 =. (Po=Rs25/)

Accordingly,

$re=do/po$

   $=1.60/25$

   $=$ 0.064

   $=$ $\underline{6.4\%}$

(b)Cost of Debenture Capital (Company approach)

Year	Description	Cash flow Rs	DF@8%	Discounted Cash flow	DF@6%	Discounted Cash flow
1	Issue of Debenture	95	1	95	1	95
1-3	Interest paid	(10.8)	2.575	(27.81)	2.671	(28.84)
3	Redemption at year 3	(100)	0.793	(79.3)	0.839	(83.9)
				(12.11)		(17.74)

Annual Interest rate for the Debenture = Rs100*15%(1-28%)

= Rs10.8

IRR =8% - $\underline{(-12.11)}$ *2%
                (-12.11-(-17.74)

  =8%- $\underline{-12.11}$ *2%
              5.64

  =$\underline{12.29\%}$

(Investor approach)

Year	Description	Cash flow Rs	DF@8%	Discounted Cash flow	DF@6%	Discounted Cash flow
1	Purchase of Debenture	(95)	1	(95)	1	(95)
1-3	Interest received	10.8	2.575	27.81	2.671	28.84
3	Redemption at year 3	100	0.793	79.3	0.839	83.9
				12.11		17.74

IRR =8% - $\dfrac{12.11}{12.11-17.74}$ *2%

=8%- $\dfrac{12.11}{-5.64}$ *2%

=12.29%

(C) Weighted Average Cost of Capital (WACC) using the Market Value.

	Market value	weight	Cost of Capital	WACC
Ordinary Share Capital				
100,000,000 * 25 =	2500 Mn	84%	6.4%	5.37%
Debenture 5mn*95=	475Mn	16%	12.29%	1.96%
	2975Mn	100		7.33%

WACC=7.33%

Q3

A company is considering to raise Rs 100mn debt capital for a project. It can obtain a bank loan with a interest of 15% p.a. or offer irredeemable debentures of Rs 100/=each at the interest rate of 13%p.a.The market price of debenture is Rs 95/= .(ignore tax)

Compute Cost of Debt for bank loan and debenture? Which one is the cheapest?

Solution

Cost of Debt for bank loan   is 15% without tax.(as tax is ignored)
Cost of debenture is   13/95*100 =13.68%(formular is $re= k/po$ where $k=13, po=Rs\ 95/=$)
Cheapest is to select the issue of debentures.

Q4

State the factors to be considered in long term funding source?
Solution
1. Financial risk
2. Legal restrictions
3. Dilution of ownership
4. **Cost of Funding**

Q5

PT company plc considering a project investment of Rs200mn has paid a dividend of Rs 30/- per share and dividends are expected grow at 15%.Current market price of a PT PLC share is Rs 600/-.
The shareholders fund as at 31st December 2015 is as follows:

Stated Capital 1,000,000 ordinary shares to the amount of Rs 500mn
Retained Earnings to the amount of   Rs 100mn
Share holders'' fund   Rs600mn

A 5 year bank loan could be obtained at the rate of 15% p.a. (ignore tax)

Calculate Cost of Ordinary Share Capital ,Cost of Bank Loan and WACC at Market value method and at book value method?

Solution

Cost of ordinary share capital. (That is re)
         Dividend per share is Rs30/=.   (do=Rs30/=)
         Market price of a share is Rs 600 =. (Po=Rs600/)
         Growth rate is 15% p.a   (g= 15%)

         Accordingly,
         d1=do+g
          =30+ 15%
         re=d1/po + g
          =(30+ 15%)/600+15%
       =   *5.75%   +15%*
       =   *20.75%*

Cost of Bank Loan
Cost of bank loan is 15% (*rd=k(1-t)* where *t* is tax ignored, *k* is interest rate of 15%)

WACC at Market value

	Market value	weight	Cost of Capital	WACC
Ordinary Share Capital				
1,000,000 * 600 =	600 Mn	75%	20.75%	15.56%
Bank Loan	200Mn	25%	15%	3.75%
	800Mn	100		19.31%

      WACC=19.31%

The market price of a share of Rs 600/- includes the retained earnings value too.Therefore, retained earnings amount of Rs 100 mn should be ignored and should not be taken into calculation of WACC at market value method.

WACC at Book value

	Book value	weight	Cost of Capital	WACC
Ordinary Share Capital				
1,000,000 * 500 =	500 Mn	63%	20.75%	13.07%
Retained Earnings	100 mn	12%	20.75%	2.49
Bank Loan	200Mn	25%	15%	3.75%
	800Mn	100		19.31%

WACC=19.31%

Points to note
- Write the formula correctly for cost of Equity, cost of debt, WACC. Then substitute the figures correctly.
- Formulas need to solve with mathematical knowledge. Therefore, be thorough with Maths.
- In Loan Interest, Debenture interest calculations take the tax component into calculations.
.
- Do not forget to put the + sign before the growth rate in the Cost of Equity formula.
- When dividend growth rate is given then apply the dividend growth % to calculate the Cost of equity capital..
- Practice past papers since similar type of questions was repeatedly tested in every exam.
- Be mindful about using (+) / (-) and the arithmetical accuracy.
- Have a sound knowledge regarding the theoretical aspects of Sources of Capital and Cost of Capital.
- Practice past papers - Therefore, go through the past papers of at least 5 years.
- Use the discount table given in the Question Paper.

Points to note in Cost of Debenture Capital Calculations

- When the debentures are redeemable, it is required to use the IRR method to compute cost of debt.
- The value of debenture in the year "0" should be the Market Value of the Debenture.
- Interest income should be based on par value.
- At redemption year ,the par value of the debenture should be shown.