JAMAL MOHAMED COLLEGE (Autonomous)

Accredited (3rd Cycle) with 'A' Grade by NAAC

(Affiliated to Bharathidasan University)

Tiruchirappalli - 620 020

PG & RESEARCH DEPARTMENT OF COMMERCE

(SF-MEN)

FINANCIAL MANAGEMENT

(20UCO6CC14)

COST OF CAPITAL

SINCE 1951

Dr. P. ANWAR BASHA

Assistant Professor of Commerce

Jamal Mohamed College (Autonomous)

Tiruchirappalli

COST OF CAPITAL

MEANING

It is the minimum rate of return the firm earns as its investment in order to satisfy the expectations of investors, who provide funds to the firm. Cost of capital is the measurement of the sacrifice made by the investors in order to the capital formation with a view to get a fair return on investment

DEFINITIONS

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".

COMPONENT OF COST OF CAPITAL

- Cost of debt
- Cost of preference share
- Cost of equity
- Cost of retained earnings

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 (Irredeemable) or redeemable.

COST OF PREFERENCE SHARE

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 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 approach
- Dividend price plus growth approach
- Earning price approach

COST OF RETAINED EARNINGS

Retained earnings is one of the sources of finance for investment proposal; it is different from other sources like debt, equity and preference shares. Cost of retained earnings is the same as the cost of an equivalent fully subscripted issue of additional shares, which is measured by the cost of equity capital.

SIGNIFICANCE OF THE COST OF CAPITAL

Designing the capital structure: The cost of capital is the significant factor in designing a balanced and optimal capital structure of a firm. While designing it, the management has to consider the objective of maximizing the value of the firm and minimizing cost of capital. Comparing the various specific costs of different sources of capital, the financial manager can select the best and the most economical source of finance and can designed a sound and balanced capital structure.

Capital budgeting decisions: The cost of capital sources as a very useful tool in the process of making capital budgeting decisions. Acceptance or rejection of any investment proposal depends upon the cost of capital. A proposal shall not be accepted till its rate of return is greater than the cost of capital. In various methods of discounted cash flows of capital budgeting, cost of capital measured the financial performance and determines acceptability of all investment proposals by discounting the cash flows.

Comparative study of sources of financing: There are various sources of financing a project. Out of these, which source should be used at a particular point of time is to be decided by comparing costs of different sources of financing. The source which bears the minimum cost of capital would be selected. Although cost of capital is an important factor in such decisions, but equally important are the considerations of retaining control and of avoiding risks.

Evaluations of financial performance: Cost of capital can be used to evaluate the financial performance of the capital projects. Such as evaluations can be done by comparing actual profitability of the project undertaken with the actual cost of capital of funds raise to finance the project. If the actual profitability of the project is more than the actual cost of capital, the performance can be evaluated as satisfactory.

Knowledge of firms expected income and inherent risks: Investors can know the firms expected income and risks inherent there in by cost of capital. If a firms cost of capital is high, it means the firms present rate of earnings is less, risk is more and capital structure is imbalanced, in such situations, investors expect higher rate of return.

Financing and Dividend Decisions: The concept of capital can be conveniently employed as a tool in making other important financial decisions. On the basis, decisions can be taken regarding dividend policy, capitalization of profits and selections of sources of working capital.

TYPES OF COST OF CAPITAL

➢ COST OF DEBT

Perpetual (Irredeemable)

Irredeemable debt is debt which is not redeemed during the life time of the company.

Cost of debt **before tax** can be calculated with the help of the following formula

$$K_{db} = I/NP$$

Where,

K_{db} = Cost of debt before tax.
I = Annual interest payable
NP= Net proceeds of the debenture
Net **proceeds** of the debenture can be calculated with the help of the following formula

a) When Debt is Issued at Par
NP = Face Value – Issued expenses
b) When Debt Issued at Premium
NP = Face Value + Premium – Issued expenses
c) When Debt Issued at Discount
NP = Face Value – Discount – Issued expenses

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

K_{da} = Before Tax (1-T)

Where,

K_{da} = Cost of debt after tax T = Tax
Before Tax (K_{db})

PROBLEM NO 1

(a) A Ltd. issues Rs. 1, 00,000, 8% debentures at par. The tax rate applicable to the company is 50%. Compute the cost of debt capital.

(b) 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.

(c) 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.

(d) 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.

Solution

at par.

K_{db} = I/NP
I = 1, 00,000 x 8/100 =8,000
NP = Face Value – Issued expenses
NP = 1, 00,000 – 0 = 1, 00,000
Kdb = 8,000/1, 00,000
K db = 0.08 or 8%

After Tax Cost of Debt

K da = K db(1-T)
K da = 0.08 (1 -50%)
K da = 0.08 (1 -0.5)
K da = 0.08 (0.5)
K da = 0.04 or 4%

at a premium of 10%

I = 1, 00,000 x 8/100 =8,000
NP = Face Value + Premium – Issued expenses
NP = 1, 00,000 +10 % (1, 00,000 x 10/100) – 0
NP = 100000 + 10,000
NP = 1, 10,000
Kdb = 8,000/1, 10,000
K db = 0.07272 or 7.272%

After Tax Cost of Debt

K da = K db(1-T)
K da = 0.07272 (1 -60%)
K da = 0.07272 (1 -0.6)
K da = 0.07272 (0.4)
K da = 0.0290 or 2.90%

at a discount of 5%.

I = 1, 00,000 x 8/100 =8,000
NP = Face Value – Discount – Issued expenses
NP = 1, 00,000 - 5 % (1, 00,000 x 5/100) – 0
NP = 100000 - 5,000
NP = 95,000

Kdb = 8,000/95,000
K db = 0.0842 or 8.42%

After Tax Cost of Debt

K da = K db(1-T)
K da = 0.0842 (1 -60%)
K da = 0.0842 (1 -0.6)
K da = 0.0842 (0.4)
K da = 0.0336 or 3.36 %

at a premium of 10%

I = 10, 00,000 x 9/100 =90,000
NP = Face Value + Premium – Issued expenses
NP = 10, 00,000 +10 % (10, 00,000 x 10/100) – 2% (11, 00,000 x 2/100)
NP = 10, 00,000 + 1, 00,000 – 22,000
NP = 10, 78,000

Kdb = 90,000/10, 78,000
K db = 0.08348 or 8.348%

After Tax Cost of Debt

K da = K db(1-T)
K da = 0.08348 (1 -50%)
K da = 0.08348 (1 -0.5)
K da = 0.08348 (0.5)
K da = 0.04174 or 4.174%

Redeemable

Redeemable debt refers to debt which is to be redeemed after the stipulated period.
Cost of debt **before tax** can be calculated with the help of the following formula

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

Where,

I = Annual interest payable
NP= Net proceeds of the debenture
P = Par value of debt
n = Number of years to maturity

PROBLEM NO 2

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

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

I = 20, 00,000 x 10/100 = 2, 00,000
P = 20, 00,000
NP = Face Value – Discount – Issued expenses
NP = 20, 00,000 – 5 %(20, 00,000x5/100) – 50,000
NP = 20, 00,000 – 1, 00,000 – 50,000
NP = 1,85,0000
n = 8 years

$$Kdb = \frac{2,\,00,000+(20,00,000-1850000)/8}{(20,\,00,000+1850000)/2}$$

$$Kdb = \frac{200000+(150000)/8}{(3850000)/2}$$

$$Kdb = \frac{200000 + 18750}{1925000}$$

$$Kdb = \frac{218750}{1925000}$$

Kdb = 0.1136 or 11.36%

After Tax Cost of Debt

K da = K db(1-T)
K da = 0.1136 (1 -55%)
K da = 0.1136 (1 -0.55)
K da = 0.1136 (0.45)
K da =0.05112 or 5.11%

➢ COST OF PREFERENCE SHARE

Cost of **redeemable** preference share capital is calculated with the help of the following formula:

$$K_p = DP/NP$$

Where,

K_p = Cost of preference share
DP = Fixed preference dividend
NP = Net proceeds of the preference share

PROBLEM NO 3

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) at a Discount of 6%.

Solution

$$Kp = DP/NP$$

at par

DP = 20,000 x 100 = 20, 00,000 x 8/100 = 1, 60,000
NP = Face Value – Issued expenses
NP = 20, 00,000 – (20,000x2= 40,000)
NP = 1960000

Kp = 1, 60,000/1960000
KP = 0.0816 or 8.16%

at a premium of 10%

DP = 20,000 x 100 = 20, 00,000 x 8/100 = 1,60,000
NP = Face Value + Premium – Issued expenses
NP = 20, 00,000 + 10 %(2000000 x 10/100) – (20,000x2= 40,000)
NP = 200000 + 200000- 40000
NP =2160000

KP = 1, 60,000/2160000
KP = 0.0740 or 7.40%

at a Discount of 6%.

DP = 20,000 x 100 = 20, 00,000 x 8/100 = 1, 60,000
NP = Face Value – Discount – Issued expenses
NP = 20, 00,000 + 6 %(2000000 x 6/100) – (20,000x2= 40,000)
NP = 200000 -120000- 40000
NP = 1840000

KP = 1, 60,000/1840000
KP = 0.0869 or 8.69%

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

$$K_p = \frac{DP + (P-NP)/n}{(P+NP)/2}$$

Where,

K_p = Cost of preference share
DP= Fixed preference share
P = Par value
NP = Net proceeds of the preference share
n = Number of maturity period

PROBLEM NO 4

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.

Solution

$$K_p = \frac{DP + (P-NP)/n}{(P+NP)/2}$$

DP = 20,000 x 100 = 20, 00,000 x 8/100 = 1, 60,000
P = Face Value + Premium
P = 20, 00,000+2, 00,000 =22, 00,000
NP = Face Value – Issued expenses
NP = 20, 00,000 – (20000 x2=40,000) =19, 60,000
n= 8 years

$$KP = \frac{160000 + (2200000 - 1960000)/8}{(2200000+1960000)/2}$$

$$Kp = \frac{160000 + (240000)/8}{4160000/2}$$

$$KP = \frac{160000+ 30000}{2080000}$$

$$KP = \frac{190000}{2080000}$$

KP = 0.0913 or 9.13%

➢ COST OF EQUITY

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:

$$Ke = D/NP \quad (OR) \quad Ke = D/MP$$

Where,

Ke = Cost of equity capital
D = Dividend per equity share
NP = Net proceeds of an equity share
MP = Market price of an equity share

PROBLEM NO 5
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
D = 100 x 25/100 = Rs 25
NP = Face Value + Premium – Issued expenses
NP = 100 + 10% (100 x 10/100 = 10)- 0
NP = 100 + 10 = 110
Ke = 25/110 = 0.2272 or 22.72%

Ke = D/MP
D = 100 x 25/100 = Rs 25
MP = Rs 175
Ke = 25/175 = 0.1428 or 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:

$$Ke = D/NP + g \quad (OR) \quad Ke = D/MP + g$$

Where,

Ke = Cost of equity capital
D = Dividend per equity share
g = Growth in expected dividend
NP = Net proceeds of an equity share
MP = Market price of an equity share

PROBLEM NO 6

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%.

a) 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

Solution

a) Compute the cost of new issue of equity shares.

$$Ke = D/NP + g$$

D = Rs 12
NP = Face value – Issued expenses
NP = 100 – 4% (100 x 4/100 = 4)
NP = 100 – 4 = 96
g = 5%

$$Ke = 12 / 96 + 5\%$$
$$Ke = 0.125 + 0.05$$
$$Ke = 0.175 \text{ or } 17.5\%$$

b) Compute the cost of existing equity share capital

$$Ke = D/MP + g$$

D = Rs 12
MP = Rs 120
g = 5%

$$Ke = 12 / 120 + 5\%$$
$$Ke = 0.10 + 0.05$$
$$Ke = 0.15 \text{ or } 15\%$$

Earning Price Approach

Cost of equity determines the market price of the shares. It is based on the future earnings prospects of the equity.

The formula for calculating the cost of equity according to this approach is as follows.

$$Ke = E/ NP \quad (OR) \quad Ke = E/ MP$$

Where,
Ke = Cost of equity capital
E = Earning per share
NP = Net proceeds of an equity share
MP = Market price of an equity share

PROBLEM NO 7

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

i) Compute the cost of existing equity share capital.

ii) Compute 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

i) Cost of existing equity share capital:

$$Ke = E/MP$$

Earnings per share (E) = Profit after tax / No of shares
E= 100, 00,000/10, 00,000 = Rs 10
MP= Rs 100
Ke = 10/100 = 0.10 Or 10%

ii) Cost of Equity Capital
E = Rs 10
NP = Face value – Issued expenses
NP = 92 – 2 = 90
Ke = 10/90 = 0.1111 Or 11.11%

➢ COST OF RETAINED EARNINGS

Cost of retained earnings can be calculated with the help of the following formula:

$$Kr = Ke (1-T) (1-B)$$

Where,
Kr =Cost of retained earnings
Ke =Cost of equity
T =Tax rate
B =Brokerage cost

PROBLEM NO 8

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 10% (OR) 0.10
t = tax rate 30% (OR) 0.30
b = brokerage cost 2% (OR) 0.02
So,

$Kr = 10\% (1–30\%) (1–2\%)$
$Kr = 0.10 (1- 0.30) (1- 0.02)$
$Kr = 0.10 (0.7) (0.98)$
$Kr = 0.0686$ (OR) 6.86%

WEIGHTED AVERAGE COST OF CAPITAL

The weighted average cost of capital (WACC) is the average rate that a business pays to finance its assets. It is calculated by averaging the rate of all of the company's sources of capital (both debt and equity), weighted by the proportion of each component.

PROBLEM NO 9

From the following particulars relating to the capital structure of Bee Ltd, calculate the overall cost of capital, using i) Book value weights ii) Market Value weights.

Sources of funds	Book Value (Rs)	Market Value (Rs)	After tax (%)
Equity Share Capital	45,000	90,000	14
Preference Capital	10,000	10,000	10
Debentures	30,000	30,000	8
Retained Earnings	15,000	-----	13

Solution

Computation of Weighted Average Cost of Capital

Book value weights

Sources of funds	Amount (Rs)	Proportion (w)	After tax (%) (x)	Weighted cost in % (w) x (x)
Equity Share Capital	45,000	45,000/100000 =0.45	14	6.30
Preference Capital	10,000	10,000/100000 =0.10	10	1.00
Debentures	30,000	30,000/100000 =0.30	8	2.40
Retained Earnings	15,000	15,000/100000 =0.15	13	1.95
Total	**1,00,000**			**11.65**

Computation of Weighted Average Cost of Capital

Market value weights

Sources of funds	Amount (Rs)	Proportion (w)	After tax (%) (x)	Weighted cost in % (w) x (x)
Equity Share Capital	90,000	90,000/130000 = 0.692	14	9.69
Preference Capital	10,000	10,000/130000 = 0.077	10	0.77
Debentures	30,000	30,000/130000 = 0.231	8	1.85
Retained Earnings	----	----	----	-----
Total	**1,30,000**			**12.31**