Chapter 14

THE COST OF CAPITAL

COST OF CAPITAL

The cost of capital of any investment (project, business, or company) is the rate of return the suppliers of capital would expect to receive if the capital were invested elsewhere in an investment (project, business, or company) of comparable risk

- The cost of capital reflects expected return
- The cost of capital represents an opportunity cost

WEIGHTED AVERAGE COST OF CAPITAL (WACC)

$$WACC = w_E r_E + w_p r_p + w_D r_D (1 - t_c)$$

w_E = proportion of equity

r_E = cost of equity

w_p = proportion of preference

r_p = cost of preference

w_D = proportion of debt

r_D = pre-tax cost of debt

t_c = corporate tax rate

KEY POINTS

- Only three types of capital (equity; nonconvertible, noncallable preference; and nonconvertible, noncallable debt) are considered.
- Debt includes long-term debt as well as short-term debt.
- Non-interest bearing liabilities, such as trade creditors, are not included in the calculation of WACC.

COMPANY COST OF CAPITAL AND PROJECT COST OF CAPITAL

- The company cost of capital is the rate of return expected by the existing capital providers.
- The project cost of capital is the rate of return expected by capital providers for a new project the company proposes to undertake
- The company cost of capital (WACC) is the right discount rate for an investment which is a carbon copy of the existing firm.

COST OF DEBT

$$P_0 = \sum_{t=1}^{n} \frac{I}{(1 + r_D)^t} + \frac{F}{(1 + r_D)^n}$$

P_0 = current price of the debenture

I = annual interest payment

n = number of years left to maturity

F = maturity value

r_D is computed through trial-and-error. A very close approximation is:

$$r_D = \frac{I + (F - P_0)/n}{0.6P_0 + 0.4F}$$

ILLUSTRATION

Face value = 1,000

Coupon rate = 12 percent

Period to maturity = 4 years

Current market price = Rs.1040

The approximate yield to maturity of this debenture is :

$$r_D = \frac{120 + (1000 - 1040) / 4}{0.6 \times 1040 + 0.4 \times 1000} = 10.7 \text{ percent}$$

COST OF PREFERENCE

Given the fixed nature of preference dividend and principal repayment commitment and the absence of tax deductibility, the cost of preference is simply equal to its yield.

ILLUSTRATION

Face value : Rs.100

Dividend rate : 11 percent

Maturity period : 5 years

Market price : Rs.95

Approximate yield :

$$\frac{11 + (100 - 95) / 5}{0.6 \times 95 + 0.4 \times 100} = 12.37 \text{ percent}$$

COST OF EQUITY

- Equity finance comes by way of (a) retention of earnings and (b) issue of additional equity capital.
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APPROACHES TO ESTIMATE COST OF EQUITY

- Security Market Line Approach
- Bond Yield Plus Risk Premium Approach
- Dividend Growth Model Approach
- Earnings-Price Ratio Approach

SECURITY MARKET LINE APPROACH

$r_E = R_f + \beta_E [E(R_M) - R_f]$

r_E = required return on the equity of the company

R_f = risk-free rate

β_E = beta of the equity of the company

$E(R_M)$ = expected return on the market portfolio

Illustration

$R_f = 7\%, \quad \beta_E = 1.2, \quad E(R_M) = 15\%$

$r_E = 7 + 1.2 [15 - 7] = 16.6\%$

DIVIDEND GROWTH MODEL APPROACH

If the dividend per share grows at a constant rate of g percent.

$$P_0 = \frac{D_1}{r_E - g}$$

$$\text{So, } r_E = \frac{D_1}{P_0} + g$$

Thus, the expected return of equity shareholders, which in equilibrium is also the required return, is equal to the dividend yield plus the expected growth rate

EARNINGS-PRICE RATIO APPROACH

Cost of equity = E_1 / P_O

where E_1 = the expected EPS for the next year

P_O = the current market price

WACC

Source of Capital	*Proportion (1)*	*Cost (2)*	*Weighted Cost [(1) x (2)]*
Debt	**0.60**	**16.0%**	**9.60%**
Preference	**0.05**	**14.0%**	**0.70%**
Equity	**0.35**	**8.4%**	**2.94%**
			WACC = 13.24%

Exercise

- 1) Abascus Limited issued 15 year, 14 precent bonds five years ago. The bond which has a face value of Rs. 100 is currently selling for Rs. 108
- A) what is the pre-tax cost of debt?
- B) what is the after-tax cost of debt? (Assume a 35% tax rate)

- Q.2 Omega Enterprises issued 10 year, 9 precent preference shares four years ago. The preferences share which has a face value of Rs. 100 is currently selling for Rs. 92. What is the cost of preference shares?
- Q.3 Rao corporation has a target capital structure of 60% equity and 40% debt. Its cost of equity is 18% and its pre-tax cost of debt is 13%. If the relevant tax is 35%, what is Ro Corporations WACC?

- Q.4 Unix Limiteds equity beta is 1.2. The market risk premium is 7% and the risk free rate is 10%. Unix has a debt equity ratio of 2:3. Its pre-tax cost of debt is 14%. If the tax rate is 35%, what is the WACC?
- Q.5 Amar corporations WACC is 12% and its tax rate is 35%. Amar's pre-tax cost of debt is 14% and its debt equity ratio is 1:1. Th risk-free rate is 11% and the market risk premium is 8%. Wat is the beta of Amar's equity?

- Q. 6 Suman corporation manufactures speciality chemicals. Its debt-equity ratio is 0.8. Its WACC is 15% and its tax rate is 30%.
- A) If Suman's cost of equity is 20%, what is its pre-tax cost of debt?
- B) If Suman can issue debt at an interest rate of 13%, what is its cost of equity?

- Q.7 Mehta Ltd. WACC is 11% and its tax rate is 35%. Mehta's pre-tax cost of debt is 10% and its debt-equity ratio is 0.6:1. The risk free rate is 8% and the market risk premium is 7%. What is beta of Mehta's equity?

- Q. 7 soln
- =0.6/1.6 * 10% * (1-0.35) + (1.0/1.6 *re) = 11%
- RE = 13.7%
- = 8+ B*7 = 13.7%
- B = 0.814

Answer

- Q.1 a 12.60 b 8.19
- Q.2 10.85%
- Q.3 14.18%
- Q.4 14.68%
- Q. 5 0.49

Factors Affecting the Weighted Average Cost of Capital :

Factors outside a Firm's control:

1. The Level of Interest rates: If interest rates in the economy rise, the cost of debt to firms increases and vice versa. Interest rates also have similar bearing on the cost of preference and cost of equity.
2. Market Risk Premium: The market risk premium reflects the perceived riskiness of equity stocks and investor aversion of risk. The market risk premium affects the cost of equity directly and the cost of debt indirectly (through a substitution effect)
3. Tax Rates: The tax policy of the Government has a bearing on cost of capital. The corporate tax rate has a direct impact on the cost of debt as used in the weighted average cost of capital. The capital gains tax rate relative to the rate an ordinary income has an indirect effect on the cost of equity relative to cost of debt.

Factors Affecting the Weighted Average Cost of Capital :

Factors within Firm's Control:

1. Investment Policy: If a firm plans to invest in assets similar to those currently used, then its marginal cost of capital would be more or less the same as its current cost of capital. On the other hand, if the riskiness of its proposed investments is likely to be very different from the riskiness of its existing investments, its marginal cost of capital should reflect the riskiness of the proposed investments.
2. Capital structure policy: Firm can change its capital structure and such a change is likely to affect the cost of capital because the post – tax cost of debt is lower than the cost of equity.
3. Dividend Policy: The dividend policy of a firm may affect its cost of equity.

EXE Ltd. has the following capital structure as an 31st March, 2000:

10% Debentures	300000
9% Preference Shares	200000
Equity Shares of ₹ 100 each	500000
Total	1000000

The equity shares of the company are quoted at ₹ 102 and the company is expected to declare a dividend of ₹ 9 per share for the year.

Required:

a. Assuming the tax rate applicable to the company to be 50%, calculate the cost of capital.
b. Assuming that the company can raise additional term loan at 12% for ₹ 500000 to finance an expansion, calculate the revised weighted cost of capital. The company's assessment is that it will be in a position to increase dividend from ₹ 9 per share to ₹ 10 per share, but the business risk associated with the new financing may bring down market price from ₹ 102 to ₹ 96 per share.

[Ans: 7.71% ; 7.67%]

Calculate the marginal cost of capital from the following:

Equity	400 lacs
Internal generation	200 lacs
12% Preference shares	100 lacs
13% Debentures	800 lacs
12% cash credit from banks	700 lacs
Current Liabilities	300 lacs
	2500 lacs

The required after – tax rate of return on equity is 18% and on internal cash generation is 15%. The tax rate is 40%.

(Ans: rd = 7.8%; WACC – 11.76%)