

- **Cost of Capital** to a firm is the minimum return, which the suppliers of capital require. In other words, it is a price of obtaining capital; it is a compensation for time and risk.

The cost of capital concept is of vital significance in the financial decision-making. It is used: (a) as a discount, or cut-off, rate for evaluating investment projects, (b) for designing the firm's debt-equity mix and (c) for appraising the top management's financial performance.

Firms obtain capital for financing investments in the form of equity or debt or both. Also, in practice, they maintain a target debt-equity mix. Therefore, the firm's cost of capital means the weighted average cost of debt and equity.

- **Cost of Debt** includes all interest-bearing borrowings. Its cost is the yield (return), which lenders expect from their investment. In most cases, return is equal to annual contractual rate of interest (also called coupon rate). Interest charges are tax deductible. Therefore, cost of debt to the firm should be calculated after adjusting for interest tax shield:

$$k_d(1 - T)$$

where k_d is before-tax cost of debt and T is the corporate tax rate.

- **Cost of Equity** Equity has no explicit cost, as payment of dividends is not obligatory. However, it involves an opportunity cost.

The opportunity cost of equity is the rate of return required by shareholders on securities of comparable risk. Thus, it is a price, which the company must pay to attract capital from shareholders.

In practice, shareholders expect to receive dividends and capital gains. Therefore, the cost of equity can be thought to include *expected* dividend yield and percentage capital gain:

$$k_e = \frac{\text{DIV}_1}{P_0} + g$$

where DIV_1 is the expected dividend per share, P_0 is the market price today and g is the expected dividend growth (capital gain). The dividend growth rate, g , can be calculated as the product of the firm's retention ratio and rate of return (ROE)

in case of a totally equity financed firm. It can also be approximated by the past growth in earnings per share or dividend per share.

A more objective method for calculating the cost of equity is provided by CAPM:

$$k_e = R_f + (R_m - R_f)\beta_j$$

where R_f is the risk-free rate equal to current yield on the Treasury bills or government bonds; $(R_m - R_f)$ is the market risk premium measured as average of historical returns of a long series; and β_j is the beta of the firm j .

- **Cost of Retained Earnings** When a company issues new share capital, it has to offer shares at a price, which is much less than the prevailing market price. Therefore, the cost of retained earnings will be less than the cost of new issue of equity.
- **Weighted Average Cost of Capital** Three steps are involved in calculating the firm's weighted average cost of capital (WACC). First, the component costs of debt and equity are calculated. Second, weights to the each component of capital are assigned according to the target capital structure. Third, the product of component costs and weights is summed up to determine WACC. The weighted

average cost of *new* capital is the weighted marginal cost of capital (WMCC). WACC for a firm, which has debt and equity in the capital structure, is given by the following formula:

$$WACC = k_0 = k_e \left(\frac{E}{E + D} \right) + k_d (1 - T) \left(\frac{D}{E + D} \right)$$

where k_e is the cost of equity, k_d is the cost of debt, T is the tax rate, D is debt and E is equity. The market value weights should be used in calculating WACC.

➤ **Divisional or Project's Cost of Capital** A firm may have several divisions or product lines with different risks. Therefore, the firm's WACC cannot be used to evaluate divisions or projects. The following procedure can be used to estimate the divisional or the project's cost of capital:

- Identify comparable or pure-play firms and determine their equity beta based on the market data
- Find the average equity beta, and unlever it as follows:

$$\beta_u = \beta_l \left(\frac{E}{V} \right)$$

- Determine the division's target capital structure, and relever the beta as follows:

$$\beta_l = \beta_u \left(\frac{V}{E} \right) = \beta_u \left(1 + \frac{D}{E} \right)$$

- This is division or project's levered or equity beta. Use CAPM to calculate the cost of equity. Calculate the after-tax cost of debt for the division or project.
- Use the target capital structure to calculate the division or project's WACC.