Ch. 10 The Cost of Capital

Topics

- Weighted Average Cost of Capital (WACC)

Cost of Capital

- Cost of Capital: The return the firm's investors could expect to earn if they invested in securities with comparable degrees of risk.
  - The cost of capital is the discount rate used in calculating the NPV of investment projects and is the minimum acceptable rate of return when compared to the internal rate of return (IRR).
- Capital Structure: The firm's mix of long term financing and equity financing.

Cost of Capital and Capital Structure

- When only equity is financing a business, the CAPM may be used to calculate the company cost of capital.
- When debt securities finance a portion of assets, the cost of capital is a weighted average of the returns demanded on the debt and equity securities.
- Taxes are an important consideration in the company cost of capital because interest payments are deducted from income before tax is calculated.

  After-tax cost of debt

  = pretax cost × (1 – tax rate) = $r_{debt} \times (1 - T_c)$

Weighted Average Cost of Capital

$$WACC = \left(\frac{\text{Debt}}{\text{Value of Firm}}\right) \times r_{debt} \times (1 - T_c) + \left(\frac{\text{Equity}}{\text{Value of Firm}}\right) \times r_{equity}$$

Weighted average cost of capital (WACC): The expected rate of return on a portfolio of all the securities of the firm and the discount rate for the NPV evaluation of new investments of similar risk.

- **Three Steps** to Calculating WACC:

1. Calculate the value of each security as a proportion of the firm's market value.
2. Determine the required rate of return on each security.
3. Calculate a weighted average of these required returns.

Weighted Average Cost of Capital

$$WACC = \left(\frac{D}{V}\right) \times r_d \times (1 - T_c) + \left(\frac{E}{V}\right) \times r_e$$

Example

A firm has issued debt, preferred stock and common stock. The market value of these securities are $4mil, $2mil, and $6mil, respectively. The required returns are 6%, 12%, and 18%, respectively. Determine the WACC.

- Step 1: Firm Value =
- Step 2: Required returns are given.
- Step 3: WACC =

Measuring Capital Structure

- In estimating WACC, do not use the Book Value of securities. Book Values often do not represent the true market value of a firm's securities.
- In estimating WACC, use the Market Value of the securities.
  - Market Value of Bonds: PV of all coupons and par value discounted at the current interest rate.
    r_d = YTM
  - Market Value of Equity: Market price per share multiplied by the number of outstanding shares.
    r_e = CAPM = $r_f + \beta \times [r_M - r_f]$

Interpreting the WACC

- The cost of capital is determined by average risk of a company's assets and operations.
  - The cost of capital is applicable as a discount rate only on projects with the average risk of the business.
  - The project cost of capital depends on project risk, not the company cost of capital.
  - Investment projects under consideration with higher or lower risk than average business risk should be discounted with rates above or below the WACC.
  - ➔ The project cost of capital is a risk-adjusted minimum acceptable rate of return used as a discount rate on a specific project.