Cost of Capital Practice Problems

1. Why is it that, for a given firm, that the required rate of return on equity is always greater than the required rate of return on its debt?

   The required rate of return on equity is higher for two reasons:
   - The common stock of a company is riskier than the debt of the same company.
   - The interest paid on debt is deductible for tax purposes, whereas dividends paid on common stock are not deductible.

2. The Mountaineer Airline Company has consulted with its investment bankers and determined that they could issue new debt with a yield of 8%. If Mountaineer’s marginal tax rate is 39%, what is the after-tax cost of debt to Mountaineer?

   \[
   r_d^* = 0.08 (1 - 0.39) = 0.0488 \text{ or } 4.88\%
   \]

3. The Blue Dog Company has common stock outstanding that has a current price of $20 per share and a $0.50 dividend. Blue Dog’s dividends are expected to grow at a rate of 3% per year, forever. The expected risk-free rate of interest is 2.5%, whereas the expected market premium is 5%. The beta on Blue Dog’s stock is 1.2.

   a. What is the cost of equity for Blue Dog using the dividend valuation model?

      \[
      r_e = \left( \frac{\$0.50(1 + 0.03)}{\$20} \right) + 0.03 = 0.05575 \text{ or } 5.575\%
      \]

   b. What is the cost of equity for Blue Dog using the capital asset pricing model?

      \[
      r_e = 0.025 + (0.05) 1.2 = 0.025 + 0.06 = 8.5\%
      \]

4. Gaggle Internet, Inc. is evaluating its cost of capital under alternative financing arrangements. In consultation with investment bankers, Gaggle expects to be able to issue new debt at par with a coupon rate of 8% and to issue new preferred stock with a $2.50 per share dividend at $25 a share. The common stock of Gaggle is currently selling for $20.00 a share. Gaggle expects to pay a dividend of $1.50 per share next year. Market analysts foresee a growth in dividends in Invest stock at a rate of 5% per year. Gaggle’s marginal tax rate is 35%.

   \[
   r_d^* = 0.08 (1 - 0.35) = 0.52 \text{ or } 5.2\%
   \]

   \[
   r_p = \frac{\$2.50}{\$25} = 10\%
   \]

   \[
   r_e = \frac{\$1.50}{\$20} + 5\% = 7.5\% + 5\% = 12.5\%
   \]

   a. If Gaggle raises capital using 45% debt, 5% preferred stock, and 50% common stock, what is Gaggle’s cost of capital?

      \[
      WACC = [0.45 (0.052)] + [0.05 (0.10)] + [0.50 (0.125)]
      WACC = 0.0234 + 0.005 + 0.0625 = 0.0909 = 9.09\%
      \]

   b. If Gaggle raises capital using 30% debt, 5% preferred stock, and 65% common stock, what is Gaggle’s cost of capital?

      \[
      WACC = [0.30 (0.052)] + [0.05 (0.10)] + [0.65 (0.125)]
      WACC = 0.0156 + 0.005 + 0.08125 = 0.10185 = 10.185\%
      \]