

Answer to Question 2:

Market Value of Equity, $E = 800,000 * \$175.48 = \$140,384,000$

Market Value of Debt, $D = \$135.85 \text{ million} * 0.984 = \$133,676,400$

Market Value of Preferred Stock, $P = 500,000 * \$127.68 = \$63,840,000$

The Market Value of the Firm, $V = E + D + P = \$337,900,400$

The share of Equity, $E/V = \$140,384,000 / \$337,900,400 = 0.4155$

The share of Debt, $D/V = \$133,676,400 / \$337,900,400 = 0.3956$

The share of Preferred Stock, $P/V = \$63,840,000 / \$337,900,400 = 0.1889$

Now, we need to calculate the costs of these three instruments:

Cost of Common Equity, $r_E = 0.0784$

(using the dividend discount model with constant growth, $Re = (\text{Div1} / P_0) + g = (\$4.75 * (1 + 0.05) / \$175.48) + 0.05 = 0.0784$)

Cost of Debt, $r_D = 0.0515$

(in a financial calculator, enter $FV = \$1,000$, $PMT = \$50/2 = \25 , $N = 15 * 2 = 30$, $PV = -\$984$, Compute $I = 2.5772 * 2 = 5.15\% = 0.0515$)

Cost of Preferred Stock, $r_P = 0.07$

Finally, we can calculate the Weighted Average Cost of Capital using the formula,

$$WACC = \frac{E}{V} r_E + \frac{D}{V} r_D (1 - t) + \frac{P}{V} r_P$$

$$WACC = 0.4155 * 0.0784 + 0.3956 * 0.0515 * (1 - 0.35) + 0.1889 * 0.07 = 0.0590$$

The Discount rate = $5.90\% + 3.5\% = 9.40\%$