

Quiz 2 Solutions

Security Analysis - Finance 40610
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Fall Semester 2006

Instructions: Please answer all of the questions completely and show all of your work. You may use a formula sheet and a calculator. The quiz is worth 25 points.

1. (5 points) You are performing a discounted cash flow valuation of a Mexican firm using (nominal) cash flows denominated in Pesos. As a first step in your analysis, you are trying to determine the appropriate risk-free rate to use in your cost of capital calculations. Given the information below, what risk-free rate should you use?

Government Bond	Yield	Rating	Default Spread	Inflation Forecast
10-yr U.S. Government Treasury Bond	4.6%	AAA	0.0%	2.6%
10-yr Mexican Government Peso Bond	8.7%	Baa	1.3%	5.4%

The key here is that we want the risk-free rate to be currency matched (so that it incorporates Peso inflation expectations) and free of default risk. There are several ways we can estimate the risk-free rate in this example. First, we could take the yield on the Mexican Peso Bond and subtract the default spread, giving:

$$8.7\% - 1.3\% = 7.4\%$$

Second, we could start with the yield on the U.S. Government T-Bond and add the difference between \$U.S. and Peso inflation expectations, giving:

$$4.6\% + (5.4\% - 2.6\%) = 7.4\%$$

Finally, we could start with the \$U.S. real rate of 2% (4.6% - 2.6%) and add the forecast of Peso Inflation, giving:

$$2.0\% + 5.4\% = 7.4\%$$

2. (6 points) The current level of the S&P 500 Index 1,315. You expect the aggregate payout on the index next year to be approximately 3.1% of the current index value. Assuming a stable long-term growth rate of 6% and a risk-free rate equal to the 10-year Treasury Yield of 4.6%, calculate the implied equity premium in the U.S. market.

$$R = g + \frac{\text{Dividend}_{t+1}}{\text{Current Value}} = 0.06 + \frac{(0.031)(1315)}{1315} = .06 + .031 = 9.1\%$$

$$\text{Implied Equity Premium} = 9.1\% - 4.6\% = 4.5\%$$

3. (14 points) You are performing a discounted cash flow valuation for a new biotechnology firm. The market value of the firm's debt is \$500 million, the market value of the firm's equity is \$1,750 million, and the firm's marginal tax rate is 35%.

a) (6 points) You have unlevered the betas of each firm in the biotech industry and the average of these unlevered betas is 1.25. Assuming this industry average is a reasonable approximation of the unlevered beta for your firm, calculate the levered beta for your firm (i.e., the equity beta).

$$\beta_L = \left(1 + \frac{D(1-T)}{E}\right) \beta_U = \left(1 + \frac{500(1-.35)}{1750}\right) 1.25 = 1.482$$

b) (8 points) Using the equity beta you estimated in part (a), calculate the weighted average cost of capital (WACC) for your firm. Assume a market risk premium of 4.8%, a risk-free rate of 4.6%, and a pre-tax cost of debt for the firm of 8.5%.

$$K_e = R_f + \beta(\text{MktRiskPremium}) = 4.6\% + 1.482(4.8\%) = 11.714\%$$

$$\begin{aligned} \text{WACC} &= \left(\frac{E}{D+E}\right) K_e + \left(\frac{D}{D+E}\right) K_d(1-T) \\ &= \left(\frac{1750}{500+1750}\right) 11.714\% + \left(\frac{500}{500+1750}\right) 8.5\%(1-.35) = 10.339\% \end{aligned}$$