

If a question asks “why/explain”, you should give a full explanation that would convince a skeptic.

Name: _____
(also write your name on the back)

Finance 325: Quiz #4 – Solutions

December 2, 2010

1. You are looking into Yahoo.com as a potential investment. Below is a table with historical returns from the last 4 years. What is the expected return and standard deviation of Yahoo stock? Also give the 95% confidence interval of the expected stock return for Yahoo. (4 pts)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Yahoo.com	9%	12%	25%	-15%

$$E[r_e] = \frac{0.09 + 0.12 + 0.25 - 0.15}{4} = 0.0775 = 7.75\%$$

$$\sigma_e^2 = \frac{(0.09 - 0.0775)^2 + (0.12 - 0.0775)^2 + (0.25 - 0.0775)^2 + (-0.15 - 0.0775)^2}{4 - 1} = 0.027825$$

$$\sigma_e = \sqrt{\sigma_e^2} = \sqrt{0.027825} = 0.1668 = 16.68\%$$

95% confidence interval = mean \pm 2 σ

$$0.0775 + 2(0.1668) = 0.4111$$

$$0.0775 - 2(0.1668) = -0.2561$$

$$95\% CI [-0.2561, 0.4111]$$

2. Total risk can be divided into two components. List and define each component. Which type of risk is compensated by the market, and why? (3 pts)

Total risk can be divided into systematic and non-systematic risk. Systematic risk is the risk that cannot be diversified away; it is risk one must bear if one wants to own assets. Non-systematic risk is the risk that can be diversified away. This is the risk that affects only a subset of all assets, and therefore can be eliminated by holding other assets.

Because you can eliminate non-systematic risk on your own, the market does not compensate you for holding non-systematic risk. Only systematic risk is compensated by the market. Expected returns depend on the level of systematic risk of the investment.

3. Southwest Airlines is looking to expand beyond transporting people. They are thinking about buying United Parcel Service (UPS). Southwest Airlines has an equity beta of 0.847, and it has 35% debt in its capital structure. UPS has an equity beta of 0.487, and 20% debt in its capital structure. What discount rate should Southwest use to value this acquisition? The market return is 13% and the risk-free rate is 5%. (3 pts)

Since this is not simply a scale expansion of Southwest's existing business, we do not use Southwest's risk to calculate the discount rate. We will use UPS's beta. But since there is debt in the capital structure of UPS, we must adjust the equity beta in order to get an asset beta.

$$\beta_a = \beta_e \left(\frac{E}{D + E} \right) = 0.487 \left(\frac{0.8}{0.2 + 0.8} \right) = 0.3896$$

This is the measure of systematic risk of the assets of UPS. To convert this into a discount rate, we use the CAPM:

$$E[r_a] = 0.05 + 0.3896(0.13 - 0.05) = 0.0812$$

Thus, Southwest should use a discount rate of 8.12% to value this acquisition.