FINM3093 Investments

Lecture 4 Exercises

1. Consider the two (excess return) index model regression results for A and B:

   $R_A = 1\% + 1.2R_M$

   R-square = .576

   Residual standard deviation = 10.3%

   $R_B = -2\% + .8R_M$

   R-square = .436

   Residual standard deviation = 9.1%

   a. Which stock has more firm-specific risk?
   b. Which has greater market risk?
   c. For which stock does market movement explain a greater fraction of return variability?
   d. If r_f were constant at 6% and the regression had been run using total rather than excess returns, what would have been the regression intercept for stock A?

2. Suppose that the index model for stocks A and B is estimated from excess returns with the following results:

$$R_A = 3\% + .7R_M + e_A$$

$$R_B = -2\% + 1.2R_M + e_B$$

$$\sigma_M = 20\%;\ R\text{-square}_A = .20;\ R\text{-square}_B = .12$$

   1) What is the standard deviation of each stock?
   2) Break down the variance of each stock into its systematic and firm-specific components.
   3) What are the covariance and the correlation coefficient between the two stocks?
   4) What is the covariance between each stock and the market index?
   5) For portfolio P with investment proportions of .60 in A and .40 in B, rework Problems 1), 2) and 4).
   6) Rework Problem 5) for portfolio Q with investment proportions of .50 in P, .30 in the market index, and .20 in T-bills.

3. Consider the following table, which gives a security analyst's expected return on two stocks in two particular scenarios for the rate of return on the market:

Market Return	Aggressive Stock	Defensive Stock
5%	–2%	6%
25%	38%	12%

a. What are the betas of the two stocks?
b. What is the expected rate of return on each stock if the two scenarios for the market return are equally likely?
c. If the T-bill rate is 6% and the market return is equally likely to be 5% and 25%, draw the SML for this economy.
d. Plot the two securities on the SML graph. What are the alphas of each?
e. What hurdle rate should be used by the management of the aggressive firm for a project with the risk characteristics of the defensive firm's stock?

4. Assume that the risk-free rate of interest is 6% and the expected rate of return on the market is 16%.
   a. A share of stock sells for $50 today. It will pay a dividend of $6 per share at the end of the years. Its beta is 1.2. What do investors expect the stock to sell for at the end of the year?
   b. I am buying a firm with an expected perpetual cash flow of $1,000 but am unsure of its risk. If I think the beta of the firm is .5, when in fact the beta is really 1, how much more will I offer for the firm than it is truly worth?
   c. A stock has an expected rate of return of 4%. What is its beta?

5. Two investment advisers are comparing performance. One averaged a 19% rate of return and the other a 16% rate of return. However, the beta of the first investor was 1.5, whereas that of the second investor was 1.
   a. Can you tell which investor was a better selector of individual stocks (aside from the issue of general movements in the market)?
   b. If the T-bill rate was 6% and the market return during the period was 14%, which investor would be considered the superior stock selector?
   c. What if the T-bill rate was 3% and the market return was 15%?