

Whitman College
Econ 358
Exam 3
April 23, 2010

Write all answers in your bluebook. **Show all** of your work. The exam ends at 10:50.

1. Consider a pair of securities A and B, each of which is risky. Consider also a security G that is riskless.

(a) (5pts) What does it mean that security A is risky?

(b) (10pts) Write the formula for the variance of a portfolio composed of A, B and G. Indicate which, if any, of the terms in this formula has a value of zero.

(c) (15pts) True or false? A portfolio composed of A and G exhibits a diversification effect. Explain your answer, including a definition of the diversification effect.

2. (20pts) Assume the following situation. A portfolio is composed of equal proportions of N securities. All of the securities in the portfolio have the same variance, and every pair of securities has the same covariance as any other pair. Suppose a colleague asks you whether owning five different securities provides adequate diversification in this situation. Thoroughly explain your answer, with reference to helpful equations and a helpful graph.

3. Use the following information to answer questions (a)-(e) below. Suppose that the Capital Asset Pricing Model (CAPM) assumptions hold.

The standard deviation of the market portfolio (M) is 0.25.

The expected return of the market portfolio is 0.13.

The standard deviation of Security A is 0.30.

The standard deviation of Security B is 0.15.

The covariance of Security A with B is 0.005.

The covariance of Security A with M is 0.02.

The covariance of Security B with M is 0.01.

The risk-free rate is 0.03.

(a) (20pts) Graph the Capital Market Line. On your graph, carefully indicate Security A, Security B, M, and the feasible set of risky securities.

(b) (5pts) Max spends \$1000 on the risk-free asset, \$90 on Security A, \$150 on Security B, \$200 on Security C and \$300 on Security D. Nathaniel spends \$4000 on the risk-free asset, and \$45 on Security A. How much does Nathaniel spend on Security D?

(c) (10pts) Suppose someone was willing to put up with a standard deviation of 0.05, but no higher. What portfolio would this person hold? What expected return would this portfolio have?

(d) (10pts) The CAPM assumes there are no regulations, including no limits on the amount of leverage that can be used. For instance, a financial firm could borrow \$900 million at the risk free rate and combine it with \$100 million of their own funds, using the total to buy risky securities. What is the expected return of the resulting portfolio?

In an April 21, 2010 *Wall Street Journal* article entitled “Debt ‘Masking’ Under Fire,” Tom McGinty, Kate Kelly and Kara Scannell report that “Excessive borrowing by [investment] banks is widely considered to be one of the causes of the financial crisis, leading to bank runs in 2008 on firms including Bear Stearns and Lehman Brothers... Tuesday’s [House Committee on Financial Services] hearing focused on a recent report by a bankruptcy examiner that found that Lehman Brothers had... hidden its true debt levels before its collapse...”

(e) (5pts) Consider the financial firm in part (d). What incentive would it have to hide its true debt levels? Be as specific as you can in your answer.