Whitman College
Econ 358
Final Exam
May 13, 2010

Write all answers in your blue book. **Show all of your work.** The exam ends at 11:20.

1. Consider Fisher's simple savings model, as described in class. This is a two-period pure exchange economy with one non-durable and divisible consumption good at each date. There are many non-identical consumers endowed with positive quantities of the goods, and nothing else.

(a) (15pts) Consider a particular individual with endowment $Y_1 > 0$ at date 1 and $Y_2 > 0$ at date 2. Let r be the equilibrium interest rate between date 1 and date 2. Suppose this person wishes to borrow at the current market interest rate. Draw a budget line and set of indifference curves for this person. Label his date 1 and date 2 endowments. Let c^*_1 stand for his consumer equilibrium quantity of date 1 consumption, and c^*_2 stand for his consumer equilibrium quantity of date 2 consumption. Label c^*_1 and c^*_2 on your graph. Indicate in red on your graph how much he wishes to borrow.

(b) (15pts) Suppose that at date 1, before the individual is about to borrow, the credit market in this economy stops working, so that no one can borrow or lend. On your graph from part (a), show the amounts the individual would consume and the indifference curve he would be on, when there is no credit market. Label his consumer equilibrium quantities c'_1 and c'_2. How does the collapse of the credit market affect the utility this individual can achieve?

2. (20pts) Suppose your boss announces that a particular project has an internal rate of return of 5%. He now asks you to tell him whether the project should be undertaken. What should you tell him?

3. (20pts) Suppose that a particular project would require spending $2400 now in order to produce a good now and in each of the next sixteen years. The good would sell for a price of $200 now. The price would rise each year at the annual rate of inflation, which is 6.0%. There are no other costs of benefits to the project. The annual nominal interest rate is 8.1%. What is the net present value of the project?

4. (a) (5pts) Define the diversification effect.

(b) (15pts) Write out the formula for the standard deviation of a portfolio composed of Security A and Security B. Use your formula to show that if the correlation between A and B is equal to 1, then the diversification effect does not hold.

(c) (5pts) Explain why the diversification effect does not hold when the correlation between A and B is equal to 1.

5. Suppose that the Capital Asset Price Model assumptions hold. The expected return on the market portfolio is 13%. The risk-free rate of return is 5%. The variance of the market portfolio is 0.04. The following securities are part of the market portfolio.

Security	Standard deviation	Covariance with the market portfolio
A	0.30	0.04
B	0.15	0.02
C	0.35	0.06
D	0.06	-0.01

A firm is privately considering undertaking an investment project. Management has instructed those who know about the potential project to keep that information confidential until next week. The project has a standard deviation of 0.15 and a covariance with the market portfolio of 0.02. The project would provide the following expected benefits and costs.

	Expected Benefits	Expected Costs
0	$0	$200,000
1	100,000	0
2	100,000	0
3	100,000	0

The price of the firm's stock is currently $14.20. The firm has 100,000 shares of stock outstanding.

(a) (25pts) What is the net present value of the project?

(b) (15pts) Suppose that the strong form of the Efficient Markets Hypothesis holds. What exactly will happen to the price of a share of the firm's stock when the firm announces the project? Explain your reasoning.

(c) (15pts) Suppose that the semi-strong form of the Efficient Markets Hypothesis holds, but the strong form does not. What exactly will happen to the price of a share of the firm's stock when the firm announces the project? Explain your reasoning.

6. Suppose that the Capital Asset Pricing Model assumptions hold, with the exception that there is a regulation. That regulation forbids leverage, i.e. it forbids anyone from using borrowed funds to buy risky securities.

(a) (5pts) Draw a graph of the feasible set of risk and return for individually risky securities.

(b) (10pts) On your graph from part (a), indicate in red the efficient set of risk and return for someone who can lend at the risk free rate, and can own risky securities, but cannot use borrowed funds to buy risky securities.

7. (a) (5pts) A proposition is a statement that if certain assumptions hold, then a particular conclusion follows. State Modigliani-Miller Proposition I.

Use the following information to answer parts (b)-(d). Suppose that the Modigliani–Miller assumptions hold. Consider a firm that pays 6% interest on its debt. The market value of that debt is $450,000. The firm has 100,000 outstanding shares of stock. The price of a share of stock is $7.50. The firm's expected annual profits before interest are $120,000.

(b) (5pts) Show the firm's balance sheet.

(c) (15pts) What is the expected return on the firm's stock?

(d) (10pts) If this firm issued enough debt to buy back and retire half of its outstanding shares of stock, without changing its operations, what would be the expected return on the firm's stock?