FINC460/FE312 - Midterm Exam

NAME: _____ SECTION: _____

1. Please do not open this exam until directed to do so.
2. This exam is 90 minutes long.
3. Please write your name and section number on the front of this exam, and on any examination books you use.
4. Please show all work required to obtain each answer. Answers without justification will receive no credit.
5. State clearly any assumptions you are making.
6. This is a closed book exam. No books or notes are permitted. Calculators are permitted. Laptops are permitted but you are only allowed to use Excel and a blank worksheet.
7. Brevity is strongly encouraged on all questions.
8. The exam is worth 115 points.
9. Relax, and good luck!

Hints:

1. *Think through problems before you start working. Draw pictures.*
2. *If you get stuck on part of a problem, go on to the next part. You may need to use answers from earlier parts of the question to calculate answers to the later parts. If you weren't able to solve the earlier part, assume something.*
3. *Remember, setting up the problem correctly will get you most of the points.*

Question 1 (40pts)

1. (8 points) You are working as a manager in a fund of funds. Your job is to identify promising hedge fund managers that outperform the market, and invest part of the funds assets with them. The rest of the fund's assets will be invested in an index fund that closely tracks the S&P 500. Which criterion would you use to select fund managers?

2. (8 points) Suppose that stocks with low price-to-earnings ratios had higher average returns than large stocks. This pattern violates the CAPM.

3. (8 points) Investors can easily increase their Sharpe ratio by borrowing money to invest in risky securities.

4. (8 points) If the market portfolio is efficient, investors care only about means and variances, and the average investor neither borrows nor lends, then the risk premium on the market portfolio is proportional to its variance and to the average coefficient of risk aversion across investors.

5. (8 points) Adding individual stocks to an already diversified portfolio will always increase the variance of the portfolio.

Question 2 (75pts)

You have the following information

Security	Expected Return	Beta	Standard Deviation	Market Capitalization
Risk-Free Asset	3%	-	-	
Market Portfolio	8%		10%	100b
Stock A		1.2	25%	20b
Stock B		1.4	40%	
Stock C		0.5	10%	

Answer the following set of questions. **For all parts of this question, assume the CAPM properly prices all assets.** You should assume that the risk-free rate is the same for borrowing or lending. For some of the questions you may need the answer to previous parts to solve them. If you do not have it, assume something and move on.

1. (10 points) What are the expected returns of Stocks A, B and C in equilibrium?

2. (10 points) What fraction of the total variance of stocks A, B and C is due to systematic – as opposed to idiosyncratic – risk?

3. (5 points) Assuming you have a risk aversion coefficient of 8, which combination of the five assets above should you hold? Specify the fraction of your wealth that you will put in each of the five assets.

4. Again assume that you have a risk aversion coefficient of 8. Now assume that you can only hold **one** of the three risky assets (A, B or C) in combination with the risk-free asset.

   (a) (5 points) Which of the three should you hold, and why? (Just specify A, B or C and explain).

   (b) (5 points) How would your answer change if your risk aversion coefficient were very large? (Specify A, B or C and explain)

   (c) (10 points) How much more would you be willing to pay – as a fraction of your wealth – to have access to all securities?

5. (15 points) What is the market capitalization of stocks B and C?

6. Assume that there are only two types of investors in the economy, types I and II, and that the total financial wealth of each of these two types is equal to 50b (and they have no other sources of wealth). The risk-aversion coefficient of the Type I investors is A_I, and of the Type II investors is A_{II}. Assume the type I investors have 25% of their wealth invested in the risk-free asset. Find:

   (a) (5 points) The fraction of their wealth that the Type I investors place in the market portfolio

   (b) (5 points) The fraction of their wealth that the Type II investors place in the market portfolio

   (c) (5 points) The coefficients A_I and A_{II}.

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