FINC460 - Midterm Exam

NAME: _____ SECTION: _____

1. Please do not open this exam until directed to do so.
2. This exam is 1 1/2 hours 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, except for a formula sheet. 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 110 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.*

Short questions (40pts)

Assess the validity of the following statements (True, False or Uncertain) and explain your answers. Each question is worth 8pts.

1. (5 points) An investor can increase her Sharpe Ratio by leveraging the mean-variance efficient portfolio with the risk-free asset.

2. (5 points) If the CAPM holds, then the expected return on any risky asset must be higher than the risk-free return.

3. (5 points) Value firms have higher average returns than growth firms. This represents the possibility of a risk-free profit at zero cost (an arbitrage).

4. (5 points) Even if the CAPM is wrong, all assets should have zero alpha with respect to the mean-variance efficient portfolio.

5. (5 points) The Black Litterman model assumes that the CAPM prices all assets.

Question 2 (75pts)

Assume the CAPM properly prices all assets. There are only 2 stocks in this economy: A and B. You have the following data available to you:

Security	Expected Return	Variance	Market Capitalization
Risk-Free Asset	1%	-	-
Market Portfolio			100b
Stock A	6%	4.5%	50b
Stock B	11%	9.0%	50b

The blank entries in the table are intentional! You should assume that the risk-free rate is the same for borrowing or lending.

Recall that portfolios on the **minimum-variance frontier** are those consisting *only* of risky assets which, for a given level of expected return, achieve the lowest possible level of volatility.

1. (5 points) Which of these assets (if any) lie on the capital allocation line?

2. (10 points) Draw the minimum-variance frontier (approximately). Which assets lie on the frontier?

3. (10 points) What are the weights w_A and w_B of the mean-variance efficient portfolio on assets A and B?

4. (10 points) Find the correlation between assets A and B.

5. (10 points) Find the expected return and standard deviation of the mean-variance efficient portfolio.

6. (10 points) An investor would like to invest 60% of her wealth into the mean-variance efficient portfolio. What is his implied risk aversion?

7. (10 points) Now, let's find a portfolio of A and B that has *zero* correlation with the mean-variance efficient portfolio. What are the weights w_A^0 and w_B^0?

8. (10 points) We will call this the *zero-beta* portfolio. What is the expected return of the zero-beta portfolio? Plot the location of the portfolio on the minimum-variance frontier.

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