February 12, 2019

Exam: Midterm, 1.5 hours

Ivo Welch. UCLA Anderson Finance MFE 404, Winter 2018. February 12, 2019

READ THIS FIRST:

- Paraphernalia: One 3-by-5 inch index card (any notes on front and back that you wish). One calculator. No computers, notes, or textbooks allowed.
- You have 90 minutes to answer 29 questions on 9 pages, which is not a whole lot. If you do not know the answer, *just move on*.
- **If you do not put down your pen when the TA states you have to do so, then we may reduce your score and/or assign you a 0. Everyone is to follow the rules to the letter.**
- The number in parentheses in front of each question is the number of points.
- For a clearly wrong question, you can receive negative points. If you have no clue about the answer, you are probably better off leaving the answer blank. If you have some clue, give it your best shot. We will liberally subtract points for wrong answers—in particular, we do not like the idea of 3 different answers, one of which is correct, two of which are incorrect. So, if you show us two different solutions, you can at best only get half credit and more likely 0, unless you clearly outline assumptions that you have to make because my question is ambiguous. If you show us 2 wrong answers and 1 right answer, you will get negative points. The point is to stop you from wild-guessing or showering us, not to stop you from writing what you really know.
- Your *final answer* must be in the right units, so make sure to distinguish between raw numbers and percent, between dollars and dollars-squared, etc.
- We will try to give partial credit, so show your work.
- Write clearly. If we cannot understand what you mean, you lose. Generally, try to be concise. If you have the correct answer and an incorrect answer, you will get 0.
- If you believe a question is ambiguous, please make reasonable assumptions, and spell them out in your answer. The TA is not allowed to answer questions about specific questions. I may also deliberately include questions that cannot be answered. If you believe this is the case, please explain why you cannot answer a question.
- **Assume a perfect market, unless otherwise indicated.**
- You must turn in this exam itself together with your answers in it. Use only the blank rear of the pages for your calculations. We want to be able to check that you did the work in cases of doubt. Usually, we just ignore everything on the rear pages.

1. (1) What is your name and section (morning or afternoon)? Who sits to the left of you? Who sits to the right of you? (Yes, we do give points here, too.)

2. (0) What is the name of the corporation in Bladerunner?

3. (8) Write a computer program that calculates geometric and arithmetic rates of return for the two CRSP equal-weighted and value-weighted index series from 2000/01/01 to 2010/01/01. Note that you do not have to calculate the indexes themselves, but can use the CRSP series.

4. (4) Construct a valid (X)HTML table (proper openings and closings) that looks like this:

Person A	2	
Person B	0	1

5. (4) What is a short squeeze?

6. (4) Is no uncertainty a perfect-market assumption?

7. (4) A 1-year semi-annual 10% coupon bond promises to pay $100,000. The prevailing appropriate expected rate of return (cost of capital) on such bonds is 5%. What is its price?

8. (4) Is it easier to maintain an equal-weighted portfolio or a value-weighted portfolio?

9. (4) How would you arbitrage a situation in which there is a risk-free rate and another asset with an expected rate of return lower than the risk-free rate?

10. (4) What are the first interest and principal payments on a 5-year monthly level-payment loan with an coupon rate of 0.5% per month?

11. (4) How would a hedge fund maximize a Sharpe ratio even in the absence of any skill whatsoever?

12. (4) Stocks A and B have expected rates of return of 1% and 2% respectively, and standard deviations of 10% and 20%. Their returns have no correlation. If you invest 1/2 of your portfolio in A and 1/2 in B, what is your portfolio expected rate of return and standard deviation?

13. (4) A Falcon-9 rocket is carrying a communication satellite. The cost of capital for rockets is about 5%; for communication satellites, it is 20%. SpaceX has a 93% success rate. SpaceX's rocket cost $60 million. The comm satellite costs $300 million, and is expected to fail with a 1-in-10 probability every year. If it functions, it is expected to earn a net of $100 million in a year. Is this a positive NPV investment?

14. (4) What is the IRR of a project that costs $1, pays out $2, and then requires a cleanup cost of $10?

15. (4) When is it reasonable to consider stock returns to be independent draws in an event study?

16. (4) A bond will pay off either $100 with 90% probability or $90 with 10% probability, and offers a YTM of 3.1%. The risk-free rate of an equal-maturity Treasury bond is 2.1%. What do you know about the risk-aversion of its investors?

17. (4) Explain why an S&P 500 ETF (that is not paying out) is unlikely to appreciate at the same rate as the S&P 500, and assess reasonable magnitudes to these changes.

18. (4) Write down the CAPM. Make sure to get all the subscripts right.

19. (4) Why is it so important to have a perfect market?

20. (4) What are common remedies for investor disagreements?

21. (4) If the muni AAA rate is 2% and the corporate AAA rate is 2.5%, what is the implied tax rate?

22. (4) Given an example of a great bet and an example of an arbitrage, so that the great bet would vastly dominate the arb in most people's eyes.

23. (4) What is the evidence for superior trading performance?

24. (4) Explain how many year of returns you would expect to need in order to assess trading performance to be reasonable. Show your calculations.

25. (4) What mechanisms can help mitigate the “disagreement” market imperfection?

26. (4) What is the difference between transaction premia and liquidity premia?

27. (4) In the US, rank the desirability of earnings based on tax considerations for ordinary income, capital gains, dividends, and interest payments. What are the approximate Federal income tax rates this coming year for highest-bracket ordinary retail investors?

28. (4) What is a public-goods problem, like the Tragedy of the Commons?

29. (4) In a perfect market, can firms reduce their own risk by diversification? What happens if the CAPM holds?

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other course related comments are welcome. otherwise, use as scratch.