Finance Review

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January 9, 2017

1. What is the most interesting financial news in the last week?

2. What do you have to *assume* if you want use most modern finance (the law of one price [the time-value of money and NPV, IRR, CAPM, Options Pricing, etc]? [Ch1-2]

3. What is a Perfect Market [Ch1-2]

4. Does the Law-of-One-Price hold if the market is not perfect? [Ch1-2]

5. The nominal rate is 10%. Inflation is 5%. What is the real rate? Be exact.

6. You will be paid \$100 in 5 years for sure. What is the present value of this \$100 today if the interest rate is 10% and the inflation rate is 3%?

7. A biotech firm has a drug in development that will allow you to sell your firm to Pfizer for \$10 billion next year if the drug works out. Thus, there is only one time-unit left. Assume your boss wants you to use the CAPM. Your firm has a beta of 2, the risk-free rate is 3% per year, and the market risk premium is 4% per year. What do you think this firm is worth?

8. Unsubsidized Stafford federal student loans are fixed interest 25-year loans. Like most loans, interest is compounded monthly. For 2015-2016, they quote an interest rate of 5.8% for graduate studies. After graduation, you have a 6-month no-payment grace period to find a job. The term is 25 years. Assume you graduate with \$110,000 in debt. How much should your monthly payment be?

9. What is your principal balance after the first payment?

10. In December 2015, the Tesla website listed the cost of a Model S 70D with RWD, Autopilot, and rear-facing seats list on their website at \$75,500 + 10% sales tax = \$1,200 destination fee + DMV registration. With 10,000 miles, the estimated lease payment was claimed \$826/mo (plus Ca sales tax) plus a \$4,021 effective down payment (incl. \$5k down, \$809 first month, \$695 acq fee, \$513 sales tax, \$551 registration fee). If you find this confusing, like I did, you go to the Tesla store to get the cash flows: for both the lease and buy, \$2,500 down. If you lease, you then pay \$5,194 upon delivery; if you buy, \$82,295. For the lease, you then pay \$900 per month [but not in the first month]. For the buy, you get back \$7,500 in Federal tax

credit. (Unless you are on the California welfare rolls, there are no more California subsidies!) A good ballpark estimate for luxury cars is 1.5% depreciation per month. In December 2015, if you had wanted to save in risk-free CDs, a 3-month CD yielded 0.5%, a 3-year CD yielded 1.5%. Three-year car loans were available at 2.5%. What is the better deal for you? By how much? For this question, use a computer spreadsheet.

11. Porsche quoted for a $49,050 Boxster a 36-month lease for $798.45/mo (no money down) and a 24-month lease for $685.24/mo ($5,000 down). Your relevant interest rate is the 0.5%/mo. Which is the better deal? Do you have to make assumptions?

12. A 30-year semi-annual 5%-coupon corporate bond promises to pay $10,000. What is its price? (Ch3)

13. Is the *expected* temperature tomorrow a random variable?

14. Should an ETF tracking the S&P 500 earn more or less than the percent change in the S&P 500?

15. I downloaded the S&P500 tracking ETF IVV from Yahoo Finance and posted it on the course website. IVV has been available since May 19, 2000 (105.61). On December 16, 2015, it stood at 209.17.

- Can you calculate the annualized arithmetic rate of return?
- Can you calculate the annualized geometric rate of return?
- Can you calculate the annualized standard deviation?

16. On December 17, the S&P increased by 1.5%. Is this high? Low?

17. Give me an over-under fair bet for the *absolute* rate of return in the stock market from closing today to closing tomorrow. For example, you can say -5% to +5%. Note that I can choose which side to take. If you choose this large a range, I will go for under.

18. If this 1.5% had been the typical daily sd, what would the annualized standard deviation have been?

19. Define the Sharpe ratio, and explain how to calculate it. How does it grow with time?

20. If you believe the stock market will have a monthly rate of return of 0.25% (and using the earlier daily sd of 1.5%), what would you estimate the annualized Sharpe ratio on the market to be?

21. What is the difference between the efficient frontier, portfolio optimization, and the CAPM? Which works without the other?

22. What is the equity premium? Today? How do you determine what it is?

23. Is it tougher to maintain a value-weighted or an equally-weighted portfolio? (PS: what is the CAPM market portfolio?)

24. What is the difference between a geometric and an arithmetic return? Can you lose all your money and have one of them be positive? As an investor, which one do you care about? Which do mutual funds quote?

25. Write down the CAPM. (Make sure to get the subscripts right. What is firm-specific?) What assumptions does it require?

26. How well does the CAPM work?

27. If the CAPM does not hold, do you care about the equity premium?

28. A Laker Bond offers an interest rate of 9.3%. Treasuries offer barely 3%. (Guess your equity premium.) Why?

29. The levered equity market-beta of a firm with a liabilities-to-equity-ratio of one-to-one is 2. What is its asset market-beta?

30. What exactly makes a bet an arbitrage? (Define *arbitrage* concisely and precisely.) Is a good bet always arbitrage? Vice-versa?

31. Bet A is "black" on roulette. You invest $1. What is your return if you win? If you lose? What is your expected rate of return? What is your risk, in rate of return?
(In non-Atlantic-City roulette, Prob(Win)=0.4737.)

32. Bet B is "even" on roulette. You invest $1. What is your expected reward? What is your risk?

33. What is the risk and reward of investing 2/3 in Bet A and 1/3 in Bet B?

34. What is a population statistic? A sample statistic? Is there a difference between population and sample statistics, and if so, for what statistics? Do you care? Does Excel?

35. How is an efficient market different from a perfect market?

36. Give an example of a project with no IRR and an example with multiple IRRs

37. What's the difference between an IRR and a rate of return?

38. What is the difference between YTM and IRR?

39. Can you manipulate your fund's Sharpe ratio? If so, how?

40. What is the Gordon dividend growth model? Do you trust it?