

Final Examination (150 minutes)

No calculators allowed; if calculations are needed, write the explicit equation(s). Do not write “ $Y = aX$; solve for X .” You can write “ $100 = 10X$; solve for X .” The price of extra time is 1 point/minute; e.g., if your test is handed in 5 minutes after the scheduled finish time, 5 points will be subtracted from your test score.

1. Many Japanese firms use a “yen in, yen out” criterion for evaluating investments at home and abroad. By this criterion, an investment is attractive if the total amount of yen received (yen in) from the investment is greater than the total amount of yen spent on the investment (yen out), and an investment is more attractive the fewer the number of years it takes for the cumulative yen in to exceed the cumulative yen out. Explain why the yen in, yen out criterion is flawed.

2. Mr. Jones is a new investment manager who wants to use modern portfolio theory to manage his clients’ money. He is starting with three asset classes (1-year Treasury bills, 20-year Treasury zeros, and a Vanguard stock index fund) and wants to find the Markowitz frontier for a 1-year investment horizon. He collected annual data over the past 20 years on the interest rate B on 1-year Treasury bills, the interest rate Z on 20-year Treasury zeros, and the annual price change S in the S&P 500. He then calculated the historical means, standard deviations, and correlations as a starting point, to be adjusted based on current market conditions. Explain his mistakes:
 - a. He estimated the mean stock return from the average value of S .
 - b. He estimated the correlation between Treasury-zeros and stocks from the correlation between Z and S .
 - c. He estimated the Treasury-bill standard deviation from the standard deviation of B .

3. The Motley Fool’s “Foolish Four” investment strategy is, at the beginning of January each year:
 - a. Identify the 10 Dow Jones Industrial Average stocks with the highest dividend yields (dividend/price)
 - b. Of these 10, identify the five stocks with the lowest prices
 - c. Drop the stock with the lowest price
 - d. Invest 40% of your wealth in the second-to-lowest priced stock and 20% each in the other three stocks.Explain why each of these four criteria either does or does not make sense to you:
 - a.
 - b.
 - c.
 - d.

The Motley Fool’s leaders, Tom and David Gardner, report that during the 20-year period, 1973-1993, the Foolish Four strategy returned an annual average return of 25 percent and that it “should grant its fans the same 25 percent annualized returns going forward that it has served up in the past.” Why are you skeptical?

4. Most corporate bonds have call positions that allow the firm to repurchase the bond at a set price before maturity. Interpret the position of the firm *and* the bond holders using the language of puts and calls; e.g., “the bondholders have implicitly bought a bond and written a put; the corporation has implicitly sold a put and a call.”

5. Explain why the following observation is right, but not for the reason given:
All bonds do not react the same way to changing market conditions....bonds with longer maturities are more likely to fluctuate in price. This is because the longer an investor’s money is tied up at a certain rate, the greater the likelihood that interest rates—and therefore bond yields—will change before the bond matures.

6. In February 1985, Edward Yardeni of Prudential-Bache wrote that, “The Fed must lower interest rates to offset the erosion of the financial system’s net worth.... Otherwise the financial system will collapse.” How can lower interest rates bail out financial intermediaries?

7. Time-Warner is planning a 2014 spin-off of Time, Inc., the publisher of *Time*, *Fortune*, *Sports Illustrated*, *People*, and several other magazines, giving the newly created shares of Time to the existing Time-Warner shareholders. Time’s cash flow before interest and taxes was projected to be \$524 million in 2014 and to fall by about 7% annually thereafter.
One question was what percentage of Time-Warner’s current debt should be given to Time and what percentage should be retained by Time-Warner.
An analysis published in *Fortune* assumed that Time would keep its interest payments equal to a constant percentage (for example 20%) of its cash flow, which implied that it will have to repay some of its debt as its cash flow declines. The problem, according to *Fortune*, is that the more debt that is given to Time, the more cash it will need to use to pay down its debt and the less it will have for investments in new projects.
What is the most important flaw in this analysis?

8. In January 1990, the Mexican government bought 30-year zero-coupon U.S. Treasury bonds paying \$33 billion in 2020. To price these 30-year zeros, the U.S. Treasury used the prevailing 7.925% interest rate on 30-year Treasury coupon bonds rather than the prevailing 7.625% interest rate on Treasury 30-year zeros.
 - a. Who did this benefit?

 - b. How much difference did it make?

 - c. Was the term structure upward sloping, downward sloping, or flat at the time?

9. A solicitation from Yale University [“Yale Planned Giving,”] gave this real-life example of the financial advantages of giving money to Yale: Yale grandparents “contributed \$100,000 to a trust which will pay their granddaughter \$9,000 a year for ten years—a total of \$90,000. They were entitled to an immediate income tax charitable contribution of \$41,000. Yale will receive the remaining trust assets after ten years. What is the implicit rate of return on this contribution? Just set up.

10. Part of a case study prepared by the Tuck School of Business at Dartmouth analyzed the performance of the Legg-Mason Value Prim fund during a period when the fund earned an annual return of 27.3%, compared to the market’s 21.6%. Monthly data were used to estimate the Fama-French 3-factor model

$$R_i - R_0 = 0.22 + 0.99(R_M - R_0) + 0.36SMB + 0.22HML$$

where R_i is the fund’s return, R_0 is the risk-free rate, R_M is the market return, SMB is the average return that month for the smallest 30% of stocks minus the average return return for the largest 30%, and HML is the average return that month for the 50% of stocks with the highest book/market ratio minus the average return for the 50% of stocks with the lowest book/market ratio. All returns are percents.

The case study concludes that, “The relatively low t-statistic of 1.1, however, undermines her claim and indicates that ... the high returns are associated with the fund’s exposure to size and value risk rather than the skill of the manager. Finally, the [0.92] R^2 tells us that the three factors explain all but 8% of the variation in historical returns, further lending credence to the findings.”

- a. Which estimated parameter has a t-value of 1.1?
- b. Why is 1.1 considered low?
- c. What is an alternative explanation to “the high returns are associated with the fund’s exposure to size and value risk rather than the skill of the manager”?

11. Explain why you are wary of the following analysis. Be specific!

We projected the cash flow for these two alternative 10-year projects and chose the one with the higher IRR:

Year	Project A	Project B
0	-100	100
1	10	-20
2	15	-20
3	20	-15
4	25	-10
5	30	-10
6	35	-10
7	30	-10
8	20	-10
9	10	-10
10	-40	-5

12. Explain the logic behind this advice: “for two companies whose expected growth rates are the same, you are better off with the one whose dividend payout is higher.”
13. In November 1989, an article in *The Wall Street Journal* reported that during periods of wildly gyrating stock prices, shrewd investors were using a cautious strategy known as a covered strangle: buy a stock and sell both a call and a put option against this stock. Assume that the exercise prices for the put and the call are equal to the current price of the stock. Draw a graph showing the profits from a strangle strategy as a function of the price of the stock on the exercise date.
14. Explain why you either agree or disagree with this explanation of regression to the mean by Barry B. Bannister, Trust Investment Officer, AmSouthBank, Birmingham Alabama:
[The] key financial ratios of companies tend, over time, to revert to the mean for the market as a whole. The thesis is easily defended. High returns eventually invite new entrants, driving down profitability, while poor returns cause the exit of competitors, leaving a more profitable industry for the survivors.”
15. Explain why you either agree or disagree with this answer by Daniel Peris, co-manager of Federated Strategic Value Dividend Fund, to the question “Why isn’t it better for companies to engage in stock buybacks [instead of paying dividends]?”:
“A dollar of dividends, albeit highly taxed, is still a check in the mail. A share repurchase goes off into the ether and never benefits Main Street. It’s just money that could’ve come to you that didn’t.”

16. Explain why you either agree or disagree with Gluskin Sheff economist David Rosenberg that, “a stock by definition has an infinite duration.”
17. Explain this observation by a *Forbes* columnist: “You can do a pretty good job of predicting the economy using prior changes in stock prices, but predicting stock prices from the economic forecasts works almost not at all.”
18. Explain:
When stock index futures were first proposed, a number of analysts predicted that at long last there would be an indication of investors’ expectations about the future course of the stock market. It was said that the value of such a futures contract would indicate the consensus opinion of investors concerning the future level of the associated index: in times of optimism it might be much higher than the current level of the market, while in times of pessimism it might be much lower.
Such predictions were naive, to say the least.
19. Explain what is misleading about this analysis of dual-purpose funds: Say that Widow A, who has \$1,000 and wants all the income she can get from it, and Executive B, who also has \$1,000 and wants all the growth he can get, join forces. The result is \$2,000, which is duly invested and, in a year’s time, has produced a not-unreasonable five percent in dividends and ten percent in capital gains. Five percent of \$2,000 is \$100, and that would go to the widow, who finds that she has received a ten percent return on her \$1,000 investment. The ten percent in capital gains amounts to \$200, and that goes to the executive, who discovers he’s blessed with a 20% return. Almost miraculously, both are making twice as much as they would if the fund hadn’t brought them together.
20. On commercial loans, banks often require “compensating balances,” with the borrower depositing perhaps 10% or 15% of the amount borrowed in a low-interest checking account. Suppose that a small business borrows \$200,000 at a 10% annual interest rate (compounded monthly) in a 5-year balloon loan (\$200,000 plus interest due after five years) and must keep \$20,000 in a zero-interest checking account for five years. What is the effective annual interest rate on such a loan? (Just set up.)