Econ 156
Gary Smith
Fall 2019

Midterm (75 minutes)

No calculators allowed; if calculations are needed, write the explicit equation(s), identifying the variables. Do not write "Y = aX; solve for X." You can write "100 = 10X; solve for X." If you want extra time, you can buy time at a price of 1 point a minute; for example, if your test is handed in 10 minutes after the scheduled finish time, 10 points will be subtracted from your test score.

1. In the 1980s it was argued that because some Japanese firms could borrow virtually unlimited amounts interest-free from the government, they should use a 0% required return in evaluating investment projects. Explain why you either agree or disagree.

2. Consider a 59 year-old woman with a 25-year life expectancy who has $100,000 invested to earn 2.3% a year. If the rate of inflation is 2%, how much can she spend (in real terms) each year, beginning one year from today, so that she runs out of money in exactly 25 years? Just set up.

3. In 2018, a former managing partner at JP Morgan wrote that,

   Historically, stock prices have gone up about 10% a year. Bitcoin prices have gone up even more, though there is a lot less return history. Any argument for buying stocks now could also be used as an argument for buying Bitcoin.

   How would a value investor respond?

4. Here are the interest rates on Treasury zeros on October 4, 2019:

Maturity	Interest Rate
10-year	1.54%
20-year	1.89%
30-year	2.16%

According to the Expectations Hypothesis, was the implied anticipated 10-year rate ten years from now?

5. Consider a company that has 1 million shares outstanding, assets of A = \$100 million, and a profit rate of ρ = 20%, so that it will earn \$20 million in profits during the coming year, E = \$20. The company will retain all of its profits this year and next year, Beginning in the third year, it will always pay out half of its annual profits as dividends at the end of the year. It has no debt and its assets increase each year by the amount of retained earnings. Its market price is always equal to its fundamental value. The shareholders' required rate of return is 20%. What is the stock price now, one year from now, and two years from now?

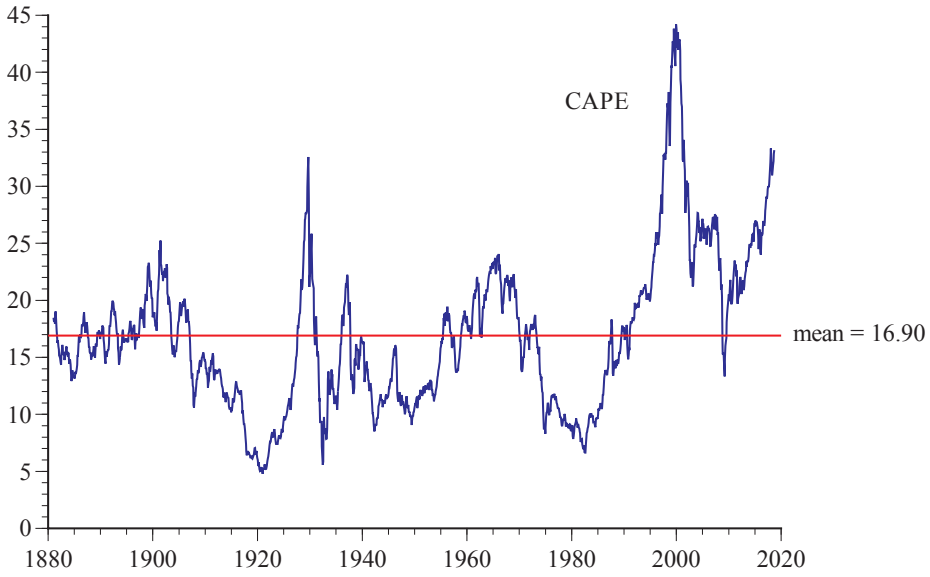
6. Your client wants to invest $1,000 of her income either in 30-year Corporate AAA bonds paying 3.8% or 30-year California AAA bonds paying 3.1%. Which do you recommend?

7. A solicitation from Yale University ["Yale Planned Giving," undated] 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, beginning a year after the contribution—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." If the grandparents are in a 35% tax bracket, the $41,000 charitable contribution will reduce their taxes by 0.35($41,000) = $14,350 immediately (assuming the grandparents itemize and there is no alternative minimum tax or other complications). What is the implicit rate of return on this contribution? Just set up.

8. Your client wants to invest $1,000 of her income either in a traditional IRA or a Roth IRA. Which do you recommend?

9. a. Why might the current value of CAPE suggest that stock prices are above fundamental values?

   b. What is the most important reason why that conclusion might be wrong?



10. For each of the following pairs, identify the asset with the longer duration:
    a. 5-year zero with a 10% yield to maturity or 10-year zero with a 5% yield to maturity.
    b. 10-year zero with a 5% yield to maturity or 10-year zero with a 15% yield to maturity.
    c. 30-year amortized $800,000 mortgage at 8% or 30-year $400,000 zero with an 8% yield to maturity.
    d. 10-year 2%-coupon bond with a 2% yield to maturity or a 10-year 4%-coupon bond with a 4% yield.
    e. a stock with an annual dividend that is currently $2 and will grow by 5% annually, or a stock with an annual dividend that is currently $1 and will grow by 10% annually.