Econ 156
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Fall 2022

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. A September 12, 2022, Advisors Perspectives article about Tobin's q stated that, "It might seem logical that fair value would be a 1:1 ratio. But that has not historically been the case." Theoretically, when will the value of Tobin's q be above 1? Below 1?

2. A car sales manager once advised a car buyer that instead of paying $12,000 cash for a car, the buyer should leave the $12,000 in the bank earning 7% interest and borrow the $12,000 from the dealer with a 4-year amortized loan at a 12% APR. The sales manager showed the customer that the total interest on the 4-year car loan would be $3,168, while keeping $12,000 in a bank for 4 years would earn $3,864 in interest. Is the sales manager correct that the customer is better off taking the car loan? Do not do any calculations but do explain your reasoning.

3. Critically evaluate the following prediction:

   It's true that interest rates are rising, but that shouldn't affect growth stocks since they don't yield much [dividends] anyway.

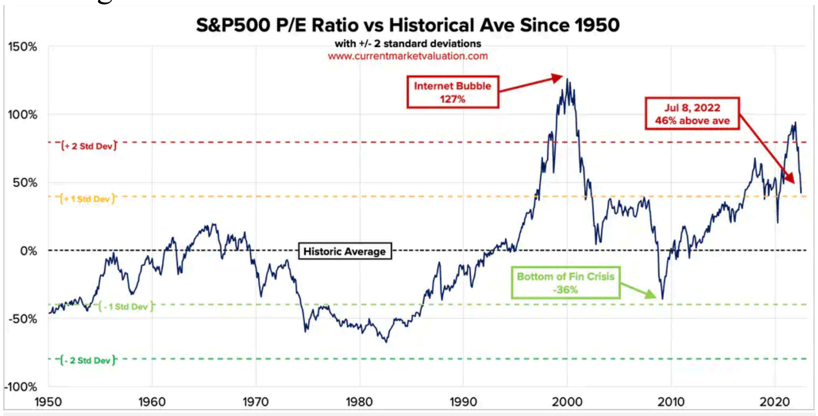
4. Robert Shiller's cyclically adjusted price-to-earnings ratio (CAPE) is equal to which of the following?
   a. current S&P 500 price divided by average real S&P 500 earnings over the past 10 years
   b. average S&P 500 real price over the past 10 years divided by average real S&P 500 earnings over the past 10 years
   c. average S&P 500 real price over the past 10 years divided by current S&P 500 earnings
   d. average value over the past 10 years of the ratio of the S&P 500 real price divided by the S&P 500 real earnings

   Explain Shiller's choice.

5. In July 2022, a very successful Pomona grad tweeted that:

This is what worries me about valuation. S&P PE multiples are still above long run average

and included a link to this figure:



What is a rational reason why the S&P 500 could have a historically high P/E and still be cheap?

6. The PEG is the ratio of a stock's price-earnings ratio to its growth rate *g*, where g is expressed as a percent,

$$PEG = \frac{P/E}{\%g}$$

Thus a company with a P/E of 10 and a growth rate of 10%, would have a PEG of 10/10 = 1. Legendary fund manager Peter Lynch popularized the PEG ratio as a way of gauging whether a stock is cheap or expensive. Lynch argues that a fairly priced stock has a PEG of 1, while a stock with a PEG greater than one is overpriced and a stock with a PEG less than 1 is underpriced.

A researcher used the constant-growth dividend discount model to derive this equation:

$$PEG = \frac{\left(\frac{D}{R-g}\right)\left(\frac{1}{E}\right)}{g} = \frac{D/E}{(R-g)g} = \frac{d}{(R-g)g}$$

and gave this example of a typical stock with d = 3, R = 3.5, and g = 2:

$$PEG = \frac{d}{(R-g)g} = \frac{3}{(3.5-2)2} = 1$$

What mistakes do you see in this researcher's analysis?

7. Evaluate this argument by a prominent economics professor:

    [W]e should curb the political influence that the banking community has achieved through its formal alliance with the Fed. It is not surprising, of course, that [banks] are more interested in relatively tight money and high interest rates than debtors and consumers.

8. If you save X every year, beginning immediately, and earn an annual rate of return R, how many years does it take until the annual return on your wealth is X? (Just set up.)

9. Is the modified duration of a perpetuity that pays $100 a year forever infinite? Explain your reasoning.

10. Explain why you agree or disagree with this advice: “In an inflationary era, when depreciation of the currency is the order of the day, a fixed, long-term obligation is not the thing to own.”