Economics 435 Fall 2021 University of Wisconsin-Madison

## Problem Set 2

Due *via Canvas* on Friday October 15, 11pm (You can submit early). Be sure to put your name on your problem set. Put "boxes" around your answers to the algebraic questions.

1. Consider the Aggregate Demand-Aggregate Supply framework, where initially the economy is at short and long run equilibrium. Suppose government spending is reduced. You can assume for simplicity expected inflation is always zero.

1.1 Show what happens in an IS-LM and AD-AS graph in the period the government spending reduction occurs.



1.2 Show what happens over time to output, the price level, and the interest rate.



1.3 Repeat 1.1 and 1.2, assuming potential GDP falls by the same amount the AD curve shifts.



2.1. Look up on Bloomberg <u>https://www.bloomberg.com/markets/rates-bonds/government-bonds/us</u> the yield on (as close as possible to) a one year T-bill. Calculate the price as if the bond were to mature one year from now (specify the date you looked up the data). Show your calculations.

2.2 Once again, look up the one year and two year yields. Assuming the expectations hypothesis of the term structure holds, what is the expected interest one year interest rate, one year from today. Show your calculations.

2.3 Hand-draw the yield curve, for 3 months to 30 years (at 3, 6, 12 months, 2, 5, 10, 30 years)

2.4 Assuming the expectations hypothesis of the term structure holds (i.e., there is no term premium), do you expect the US economy to go into recession in the next year? Why or why not?

3. Consider the following picture of corporate bond spreads (as calculated by Gilchrist and Zakrajšek), corrected for maturity differences.



3.1 Explain why the spread exhibits the pattern it does, with respect to the business cycle.

3.2 Is the entire movement in the spread due to changes in probability of default over time?

4. Asset prices. Suppose:

$$P_{t} = \frac{D_{t+1}}{1 + rf + rp} + \frac{E_{t}P_{t+1}}{1 + rf + rp}$$

(2)

4.1 Solve for the stock price assuming expectations are rational and there are no bubbles. Show your work as much as possible.

4.2 Calculate the price of a share of stock, assuming dividends are expected to be constant at  $D_0$ = 1 and (rf + rp) is also expected to be constant at 0.10. Show your algebraic work.

4.2 (4 minutes) Suppose that you revise your expectations regarding (rf + rp) downward by 4 percentage points. What immediately happens to the price of the share of stock? Once again, show your work.

E435ps2\_f21 9.10.2021