

MGTECON 300, Spring 2021
Stanford Graduate School of Business
Professor Chad Jones

Assignment #4

Due on Canvas on
Wednesday May 26 at 11:59pm (pdf only)

You are welcome to work in groups (of up to 4 people) on the homework assignments in this course; all group members must be in the same professors sections (so that the groups can be formed in Canvas). Each group turns in *one PDF* file via Canvas. Please put all group members' names on the top of the first page of your submission.

- You will need to join a Canvas group **before** submitting your solution.
- **To allow you maximum flexibility in changing groups, you will need to sign up for groups again at the start of each assignment. (It is fine to have the same group or to change groups).**
- If you have any questions about groups, please email Rachel at schuhr@stanford.edu.

1. **Predicting the Fed Funds Rate.** Consider the following monetary policy rule, which is basically a general form of the Taylor Rule expressed in terms of the real interest rate instead of the nominal rate:

$$R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi}) + \theta \tilde{Y}_t.$$

- (a) Pick some reasonable values for the parameters of this policy rule, and justify your choice of these values.
- (b) Obtain data on the inflation rate for the 12-month period ending March 2021 (please use the deflator for Personal Consumption Expenditures excluding Food and Energy for your calculation, series PCEPILFE in the FRED database described below). Assume potential output for 2021Q1 is \$19.5 trillion (in chained 2012 dollars) and obtain data on real GDP for that quarter to construct an estimate of \tilde{Y} (use the seasonally adjusted data). A very nice data resource for all of the data you will need is the FRED database of the St. Louis Fed, available here: <https://fred.stlouisfed.org/>.

Use this data and the monetary policy rule to see what fed funds rate the policy rule indicates. How does this compare to the current fed funds rate? Hint: be sure that you are comparing two nominal rates; the rule above corresponds to a real rate.

- (c) If they are different, why do you think that is the case?
- (d) Suppose the inflation rate fell significantly so that there was substantial *deflation*. In particular, suppose the inflation rate fell to $\pi_t = -2\%$ (with the same observed level of short-run output). What level of the fed funds rate would your rule recommend in this case? Is there a problem? What actions would you recommend that the Federal Reserve take?

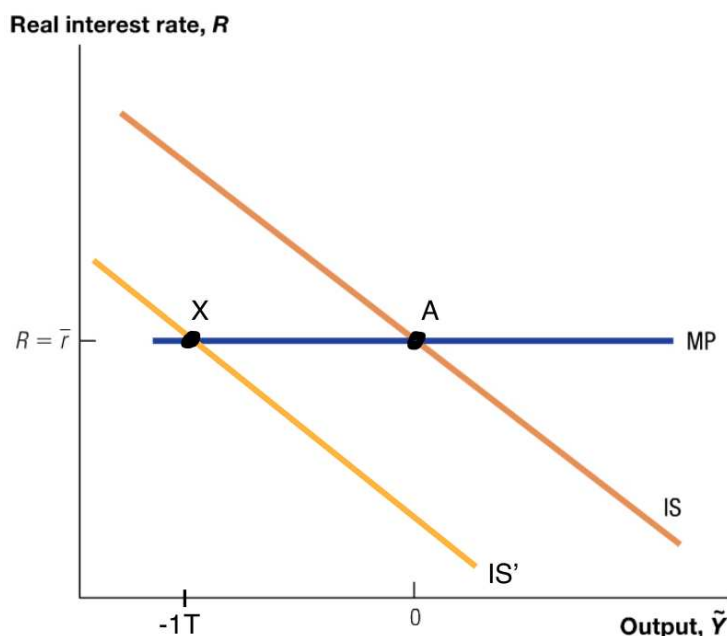
2. **COVID-19 and the Zero Lower Bound.** This question asks you to analyze the COVID-19 shock in an economy in which interest rates are eventually limited by the zero lower bound. To begin, however, assume the economy starts in its long-run position, with an inflation target of 2%.

- (a) Show the initial impact of COVID-19 on the economy in the IS-MP diagram and explain briefly what happens and why.
- (b) What does the central bank do with monetary policy in response? Draw this policy response in the IS-MP diagram. In answering this question, assume the zero lower bound prevents interest rates from adjusting as much as the central bank would like them to. What is the value of the real interest rate at the zero lower bound?
- (c) Now suppose the central bank considers raising its inflation target. Show how this would affect the economy in the IS-MP diagram. What is the economic intuition underlying this affect?
- (d) Discuss in a few sentences the implications of your findings for real economies like the U.S. and Europe. Would you recommend raising the inflation target? Why or why not?

3. **Monetary Offset and the Effects of a Fiscal Stimulus.** This problem helps you think about how and when a fiscal stimulus can be helpful in getting the economy out of a recession. Note: for this entire question, let's ignore any movements in inflation (one way to think about this is that all of these changes take place at the same time, before inflation adjusts).

- (a) Imagine the economy starts at potential, in point A in Figure 1 on the next page. A negative shock reduces demand by 1 trillion dollars ($\bar{a} = -1T$). This shifts the IS curve to the left, and the economy

Figure 1: Fiscal Stimulus in the IS-MP Framework



goes to point X . Suppose the Fed is following the Taylor Rule for setting interest rates. What does it do? Because of “long and variable lags” of monetary policy, assume the economy only moves half-way back to potential. Draw this response in the IS-MP diagram and call the new location of the economy point B .

- (b) Now imagine the government observes the economy at point B and thinks “Output is [let’s say] $1/2T$ below potential, so we should do $1/2T$ worth of fiscal stimulus.” Show in a graph which curve shifts, and what the impact on the economy is. What would happen to short-run output if the Fed kept interest rates unchanged? Label this point Y in your graph.
- (c) Notice, however, that SR output is rising between points B and Y . If the Fed is following a Taylor Rule, what does it do to interest rates, and what is the effect on the economy?

(d) In a few sentences, discuss the general point of this problem.

4. **Reading the minutes of the FOMC.** The Federal Open Market Committee (FOMC) is the formal name of the group chaired currently by Jerome Powell that meets every six weeks or so to set monetary policy in the United States. Immediately after the meeting, the FOMC issues a “statement” that consists of a few paragraphs summarizing its position. Then, three weeks later, the FOMC releases the “minutes” of its meeting. These minutes contain extensive detail about the issues that were discussed in the meeting.

Suppose your job is to explain Federal Reserve policy to the CEO of a corporation. Go to the following web page and read the minutes from the FOMC’s meeting on April 27-28, 2021. Then answer the questions below.

<https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>

- (a) What action did the FOMC take, if any, regarding the level of the fed funds rate and the amount of quantitative easing? Why did it make these decisions?
- (b) Pick a paragraph or two from the FOMC minutes and quote it in your answer (so I know which paragraph you’ve chosen). Using the terms and concepts we’ve developed throughout the course, explain the economic consequences *of the events in the paragraph(s) you’ve quoted*. You do not need to analyze anything else in the economy; just focus on what you’ve chosen.
- (c) Pick one other thing that is mentioned in the minutes that you do not understand (for example, a term you are unfamiliar with). Do some research to discover its economic significance, and explain it in two or three sentences.