PROBLEM SET #3 (12 points possible; max you can earn for all 3 PS = 30 points)
DUE: via gradescope, 11:59.00 p.m. on Friday April 23

- *PS submitted between the due date/time & 11:59.00 pm on Monday April 26 incur 5 point penalty*
- *No submission after Monday April 26 at 11:59 pm*
- *Your submitted work must be your own.*
- *Problem sets that are identical (in whole or in part) to another student's problem set will receive a zero.*
- *Problem sets with no honor pledge (item #1) will receive a zero.*
- *Problem sets with a copy/paste rather than handwritten honor pledge (item #1) will receive a zero.*
- *For each question, read the directions. They will tell you whether you are entering information directly into gradescope, uploading, or a combination.*
- *For the uploads, you can hand write or type (exception: #1 must be handwritten).*

Question 1 (If not completed, then you get a 0 on the PS)
Write out and sign the honor pledge. Photo or PDF it. Upload the file to question #1 in gradescope. You shouldn't need more than about ½ page for this answer.

In your own handwriting, write the words in the pledge below. Using a pen-enabled tablet or writing on a piece of paper is fine. But the entire pledge must be hand-written and not typed.

Directly under the pledge, provide the names of the people in your study group. If you didn't study with anyone, write "none."

Sign at the bottom.

Pledge: Studying with others in the class is ok but turning in answers or essays that someone else wrote is not ok. On my honor, the answers & essays I provide in this PS were written by me with my words. I am not copying anyone else's answer, copying from any printed or internet source, nor providing materials for others to copy. The consequence of violating this pledge is a 0 on this assignment and referral to the Office of Student Conduct. The members of my study group are: _____ Signed (your signature):

Question 2 (2 points)
Type your answer into the box in gradescope. If this were on paper, we would give you about 2/3 page for this question.

The Taylor Rule from the textbook is $r = r_0 + r_\pi(\pi - \pi^t)$. This Taylor rule actually does a decent job of capturing how the Fed is *currently* setting interest rates.

A) Define r_0 in words. Define π^t in words. Define r_π in words. (Your answer can't be "r_0 is r-naught." That's not a definition.)

B) Until the pandemic, the Fed was setting interest rates not in reaction to what the inflation rate actually was, but in reaction to the Fed's predicted value of the inflation rate some time in the future. Offer and defend an equation that captures that sort of Taylor rule.

Question 3 (2 points)

For a, do your work on paper, take a photo of it, then upload. For b, type your answer into the box in gradescope. If this were on paper, we would give you a full page for this answer.

A. Starting from these 3 relationships, derive the equation for the monetary policy reaction function: $u = u_0 + \phi(\pi - \pi^t)$. Be sure to show the full expression for ϕ.

- Taylor rule: $r = r_0 + r_\pi(\pi - \pi^t)$
- IS equation: $Y = \frac{A_0}{1-MPE} - \left(\frac{I_r + X_\varepsilon \varepsilon_r}{1-MPE}\right) r$, where MPE = $C_y(1-t) - IM_y$
- Okun's Law: $u = u^* - 0.4\left(\frac{Y-Y^*}{Y^*}\right) = u^* + 0.4\left(\frac{Y^*-Y}{Y^*}\right)$

B. Suppose that we tweaked the standard model by allowing investment to depend on both income and interest rates: $I = I_0 + I_Y Y - I_r r$. Would this increase, decrease, or have no effect on the slope of the MPRF? Explain. In your explanation, be sure it's clear what "the slope of the MPRF" means in terms of the relationship between inflation and unemployment in the economy.

Question 4 (3 points) – Edited version of Final, Spring 2020, #3

For a, draw the graphs on paper, take a photo, and upload the file. For b and c, type your answers into Gradescope. If this were on paper, we would give you about a full page for a, 1/3 of a page for b, and 2/3 of a page for c.

Throughout this question, assume that expectations are static. Also assume the standard equations, except as noted below.

A. Draw 3 separate graphs. Above each graph, as the title, write A, B, or C. In each graph, draw a standard upward-sloping MPRF. Label it $MPRF_1$. This MPRF will be the same in each of the 3 graphs.

Then in each graph, draw a Phillips curve (different PC for each graph). Try to make your original equilibrium point (u_1, π_1) the same in each of your three graphs. Label the original equilibria points with u_1, π_1 in each of the 3 graphs.

Graph A: a Phillips curve with fully-flexible wages and prices
Graph B: our usual Phillips curve, a PC with sticky wages and prices
Graph C: a Phillips curve in which the inflation rate never changes

Now, in each graph, shift the MPRF so it shows the impact of a decrease in AD. Label this curve $MPRF_2$. (Remember: we are assuming static expectations.) Label the second equilibria (u_2, π_2) in each of the 3 graphs.

B. In part a, you've shown the effects of a decrease in aggregate demand graphically. Here we want you to write out what the graphs show. How do the effects of the decrease in AD on unemployment and inflation vary between A, B, and C? To ease grading, organize your answer this way: u & π effects for A, then u & π effects for B, then u & π effects for C.

C. Is the Fed's reaction to the decrease in AD the same in each case, A, B, and C? Explain.

Question 5 (2 points; from Spring 2017 final #4)

In Gradescope, there will be boxes for the numeric answers. These will be auto-graded so pay attention to what Gradescope says about formatting of each answer. You'll need to upload a copy of your work in 5.3 in order to receive any credit for #5.

Suppose a recession has hit and the economy can be described by the following (assume the standard equations apply):

$$\begin{aligned} Fed's\ target\ inflation\ rate &= 2\% \\ initial\ expected\ inflation\ rate &= 2\% \\ r_\pi &= 0.75 \\ r_0 &= 1\% \\ MPE &= 0.4 \\ A_0 &= 6{,}000 \\ I_r &= 40{,}000 \\ X_\varepsilon \varepsilon_r &= 20{,}000 \\ u^* &= 3\% \\ OLC &= 0.4 \\ Y^* &= \$10{,}000\ billion\ per\ year \\ supply\ shocks &= 0 \\ \beta &= 0.3 \end{aligned}$$

A. Suppose expectations are static. What are the short-run sticky-price equilibrium values of the inflation rate, the unemployment rate, the real interest rate set by the Fed, and real GDP?

B. Suppose instead that expectations are adaptive: $\pi^e_{t+1} = \pi_t$. In the next period, what are the new equilibrium values of the inflation rate and the unemployment rate? What real interest rate does the Fed now set? What is the new equilibrium value of real output?

Question 6: The Essay (3 points total)

Consider this argument: "Dang! Have you looked at what the Fed has done to the money supply?!?! Inflation is going to soar in the U.S.!"

Follow steps 1, 2*, 3, and 4 of "The Olney Method" (the 5-step method Prof. Olney presented on 1/21 for critiquing arguments) and write a 1-page essay in which you critique the argument above. Your essay should reflect your understanding of how to critique an argument and your understanding of the quantity theory of money (Chapter 8 and video on bcourses).

**You need not identify <u>all</u> assumptions in the argument, but do need to at a minimum identify the assumption that you change in step 3.*

Remember that in economics (as in life), the conclusions you come to will depend in part on the assumptions you make. Don't invoke wildly unrealistic assumptions; the assumptions you make should be reasonable.

Your essay must be your own work that was developed for this course. To present anyone else's work as your own is theft of intellectual property: plagiarism. While it is unlikely that you will need to cite sources for your essay, if you do then you must use quote marks " " around any words you quote exactly from any source (and

then provide the source for the quote). Also, if you get ideas from anyone else, or if you paraphrase someone else, you must again give them credit for their ideas. To do otherwise is plagiarism: the theft of intellectual property, a violation of the Code of Student Conduct and one of the worst offenses in academe. If you have questions about whether or not you've properly cited your sources, please talk with your GSI or Prof. Olney.

"Your own work" also means that essays crafted jointly on piazza or otherwise are not acceptable. That too is plagiarism.

And, self-plagiarism is plagiarism. You cannot submit a paper that you wrote for another class.

Specifications: 400 words maximum, one page maximum. ("Works Cited" list can be on a second page and does not count against the 400 word maximum.) Double space. 10-11-12 pt font. 1" margins on all sides. Your name, date, and the word count in the top right corner.

Submission: Essay must be submitted twice. [1] Submit the essay electronically via bCourses, assignments tab. Acceptable formats on bCourses: doc, docx, pdf. bCourses will check your paper using TurnItIn to ensure you have not plagiarized from published sources or previously submitted papers written by you or others. [2] Cut and paste the essay into question #6 in gradescope. We will also provide a way in gradescope to upload files if you have graphs or figures that you want to include in your essay.

Grading: 0 - 1 - 2 - 3 points, taking into account content, following specifications, and writing quality. No submission on bCourses results in a 0 on the essay.