Economics 302
Prof. Kelly
Problem Set 5
Due: Wednesday, April 27

Exercise 1 *Comparing Classical and Keynesian-Sticky Price Models*

Consider the market for wheat. In Econ 101, you analyze this market by finding the equilibrium price and quantity as the point where the supply curve intersects the demand curve. If we throw out the graph and handed our functions for supply and demand to a mathematician, she would see two equations (an equation that gave the quantity supplied as a function of price and an equation that gave the quantity demanded as a function of price) and two unknowns (price and quantity) [to be technical, there is a third equation in the system: that quantity demanded equals quantity supplied equals quantity]. This system of equations produces an equilibrium because we have the same number of equations as unknowns.

Now, consider the whole economy. We have 3 unknowns: output, the real interest rate, and the price level. Since we have 3 unknowns, to solve for these 3 unknowns, we better have 3 equations to describe what is going on.

a) Before reading the rest of the question, can you think which 3 equations we are going to use (Hint: what equations/relations connect r, Y, and P)? Try and explain why you are selecting these 3 equations. Don't worry about getting this wrong or right, just think.

The rest of this question proceeds through a series of steps, building the necessary equations one-by-one

Step 1 Loanable Funds Market:

The marginal propensity to consume is mpc. Full-employment output (the output of the economy when workers and capital are employed at their normal levels and intensities) is $\bar{Y} = F(\bar{K}, \bar{L})$. Government spending is G and the tax level is T. The investment function is :

$$I = \frac{.1}{r}$$

b) Define and derive the IS curve in this closed economy (it will have many, many letters hanging around).

Step 2 Money Market:

The nominal money supply is M, the price level is P, and the demand for real money balances is:

$$L(Y, r) = \frac{Y}{r}$$

c) Is "money" a normal good? Why? (Hint: this is the perfect time to reference an equation in your answer: "If you look at equation ...., we know that .... because ....)

d) Define and derive the LM curve in this economy.

Step 3 Combining markets:

The IS gives the equilibrium combinations of r and Y in the Loanable Funds Market. The LM curve gives the equilibrium combinations of r and Y in the Money Market. We need both markets to be in equilibrium at the same time.

e) Use your expressions for the IS and LM curves to derive the AD curve.

Hopefully you see that the IS and LM curves give you 2 of the 3 necessary equations to solve the system.

f) Is the AD curve the 3rd equation?

The third equation is actually the AS curve and it is what determines whether we are using a Keynesian or a Classical model.

g) What assumption does the Classical Model make about output?

h) What assumption does the Keynesian Model make about the price level?

These assumptions provide the third equation, basically they tell us what the AS curve looks like.

i) What is the equation for the AS curve in the Classical Model?

j) What is the equation for the AS curve in the Keynesian Model?

Now, let's put in some numbers. Let full-employment output, $\bar{Y}$, equal 12, $T = 2$, $G = 2$, $mpc = .5$, $M = 6000$.

k) Assuming that in equilibrium the economy is producing at full-employment output, how could you use the Loanable Funds and Money Markets to solve for r and P? What is the equilibrium level of r and P?

l) Suppose you don't know the full-employment output, but know that $P{=}50$ and the other values (obviously, excluding Y) from above are the same. What are the equilibrium levels of r and Y?

Suppose we have the following equilibrium: $Y = 10, G = T = 2, r = .025, P = 20, M = 8000, mpc = .5$. The fed decides to increase M to $10,000$.

m) Show that when $M = 8000$, the economy is in equilibrium.

n) Pretend you are a Classical economist. What happens in the economy? What is the new equilibrium?

o) Pretend instead that you are a Keynesian economist. What happens in the economy? What is the new equilibrium?

Exercise 2 *Friedman*

Read the section from Milton Friedman and Anna Schwarz in "The Monetary History of the United States" that is on the course webpage. Find 3 events (monetary interventions, fiscal policy changes, exogenous shocks, etc.) described in the section. For each event, give a brief description of the event (around 2 to 3 sentences, including the date and the page on which the event can be found). If the event was a policy intervention, give a brief description of the motivation for the intervention. Use the tools and models from the semester to analyze the event, specifically, use the models to make predictions about the new equilibrium after the event. Your analysis should begin by stating what happens in the loanable funds and money markets, and then proceed from there.

Make sure you state whether you are analyzing the event as a Classicist or a Keynesian. Does the model you present accurately predict what transpired? If not, would analyzing the event as a Classicist rather than a Keynesian, or vice-versa, make a difference?

There are many brief parts required for each event, and I expect each event to require two sides of a sheet of paper, at minimum to do the event justice–so start early.

Exercise 3 *CPI*

For your last CPI check, do the usual. Then, collect all your data in a nice table and graph the CHANGES in the CPI for your entire basket over the course of the semester(remember, changes in the CPI reflect the amount of inflation). Next, graph the CHANGES in the national CPI as reported by the BLS (www.bls.gov) over the same period (April's numbers are not available until May, but the March data will be available on April 20th). Compare the two.

Your basket of goods is quite different from the representative basket used in the national CPI. Also, Madison may not be like New York or San Francisco. Under "Get Detailed CPI Statistics" is "Most Requested Statistics." Select "Consumer Price Index-All Urban Consumers (Current Series)" and find/graph the sub-data that would be closest to your basket and your geographic region. Again, compare your CPI with these.