

Economics 222
Exercise C
due Friday 12 November in class

1. Economic theory suggests that the nominal interest rate can be thought of in this way:

$$i = r + \pi^e.$$

If the nominal interest rate reflects expected (or forecasted) inflation, though, it should be a good predictor of the actual inflation rate that ensues.

To test this idea, begin by retrieving the 90-day corporate paper rate (i) from Cansim II, using the label v122491. Then retrieve the CPI inflation rate (π)(excluding volatile items) v18702646. Both series are at monthly frequency. Retrieve them for the period from 1992:1 to 2004:9.

(a) Graph the two series against time using a spreadsheet. Your graph should have an informative title, no legend (label the two lines instead), no outer box, no grid lines, different line patterns for each of the two series, lines thick enough to be clear, and axis labels.

(b) Next, graph the two series in a cross-plot, a diagram with π on the horizontal axis and i on the vertical axis. (If you wish, you can graph *lagged* i against π instead.)

(c) Does it appear that i predicts π ?

2. This question uses the $IS - LM - FE$ model to study the short-run and long-run macroeconomic effects of changes in government spending. Suppose that $\bar{Y} = 100$ and that consumption spending is described by:

$$C = 30 + 0.7Y - 10r,$$

while for investment,

$$I = 44 - 8r.$$

The economy is closed. The value of government spending is $G = 10$.

(a) Find the IS curve.

(b) Suppose that the equilibrium in the money market is described by:

$$\frac{M}{P} = Y - 4i,$$

and that the expected inflation rate is $\pi^e = 2$. The money supply is $M^s = 80$. Find the LM curve (*i.e.* an equation with r on the left-hand side).

(c) Solve for Y , r , and P .

(d) Suppose that in wartime there is an increase in government spending to $G = 15$. Draw a graph of the $IS - LM - FE$ curves (they need not be exact) and show what happens in the short run and in the long run.

(e) Using the price level from part (c), find r and Y in the short run, once G has increased. Then find r , Y , and P in the long run.

(f) According to this model, what are the initial level of consumption spending C and the short-run and long-run values of C after the change in fiscal policy?

3. This question studies the effects of changes in monetary policy, in a closed, classical economy. Suppose that the production function is:

$$Y = 10N,$$

and that labour supply is given by:

$$N^s = 3w,$$

where w is the real wage.

(a) Find the labour demand curve, the real wage, $\bar{N}$, and $\bar{Y}$.

(b) The demand side of the economy is summarized by:

$$Y = C + I$$

$$C = 0.8Y$$

$$I = 120 - 60r$$

Find the real interest rate, r .

(c) If

$$\frac{M}{P} = Y$$

and $M = 1200$, find the price level, P .

(d) Suppose that the money supply increases to $M = 1400$. Find the new values of the price level, income, and the *nominal* wage in this classical economy. What is the relationship between the percentage change in M and the percentage changes in these variables?

(e) According to the classical view, what explains business cycles in national income?

4. An economist writes: “Recent increases in the world price of oil will lead to a recession in the United States. The U.S. Federal Reserve therefore should respond with a monetary expansion, thereby lowering the interest rate.” Draw a diagram to illustrate *both* this shock and the recommended change in policy. Do you agree with this economist?

5. China currently has a large trade surplus (positive net exports) with the United States. This question studies the role of the real exchange rate between these two countries. For China, the real exchange rate is defined by:

$$e = \frac{e_{nom} P_c}{P_{us}}.$$

(a) The yuan is pegged against the U.S. dollar. Suppose that the U.S. inflation rate for 2004 is 3%. What is the highest inflation rate in China that will prevent China from experiencing a real depreciation?

(b) Suppose that the actual inflation rate in China turns out to be $\pi_c = 2\%$ for 2004. What will happen to the real exchange rate and net exports?

(c) Why would the U.S. pressure China to revalue its currency?

Exercise C Answer Guide

1. (a)

(b)

(c)

2. (a) The IS curve is given by:

$$18r = -0.3Y + 74 + G = -0.3Y + 84.$$

(b) The LM curve is:

$$4r = Y - \frac{M}{P} - 8 = Y - \frac{80}{P} - 8.$$

(c) $Y = 100$, $r = 3$, and $P = 1$.

(d) The IS curve shifts to the northeast. Then the LM curve shifts to the northwest.

(e) Solving the two equations (the new IS curve and the old LM curve) gives $r = 3.26$ and $Y = 101.04$. Notice that the directions of change match those in your diagram. In the long run $Y = 100$ so $r = 3.277$ and $P = 1.014$.

(f) Because $C = 30 + 0.7Y - 10r$, the initial value of consumption is 70. During the war, the value drops to 68.128. After the price increase, the value is 67.23.

3. (a) The marginal product of labour is 10, so $w = 10$, $N = 30$ and $Y = 300$.

(b) $r = 1$

(c) $P = 4$

(d) $P = 4.666$. Y does not change. The real wage remains 10, so the nominal wage rises from 40 to 46.67. Notice that all nominal variables change by 16.67%.

(e) Under the classical view, changes in output over the cycle cannot be due to monetary shocks. They must be due to changes on the real side of the economy, such as changes in TFP.

4. For the US, the oil price increase is a shift to the left in the FE line. That leads to a fall in Y and a one-time burst of inflation. An expansionary monetary policy would shift out the LM curve. That would temporarily prevent Y from falling, but at the cost of greater inflation.

5. (a) 3%

(b) In this case the real exchange rate will fall (China will have a real depreciation) of 1%. That would lead net exports to rise further.

(c) A revaluation would be a rise in e_{nom} . That would tend to raise e which would reduce China's trade surplus. [Unless China's inflation rate turns out to be much higher than the US inflation rate, this may be the only way for the real exchange rate and trade balance to change.]