Economics 302-001   Menzie D. Chinn
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University of Wisconsin-Madison

Problem Set 3

Due **in lecture** on Wednesday, November 10. Be sure to put your name on your problem set. Put
"boxes" around your answers to the algebraic questions.

1. In this problem, we consider the relationship between monetary policy and the financing of the
deficit. Suppose the reserve ratio r is equal 0.1, and the currency ratio c is equal to 0.2. Assume that
$(G-T+F) = \$200$ billion (P = 1). By how much would the money supply, the monetary base, currency
and bank reserves have to change if the Fed were to finance the entire budget deficit?

2. Consider an economy with a "credit channel", i.e., one with a banking system. This economy is
described in the handout "The Financial and Economic Crisis…". The CC curve is given by:

$$Y = \overline{\alpha}(A_0 - dR - \gamma\rho) \qquad (5)$$

$$\rho = \varphi_0 + \varphi_1 R + \varphi_2 Y - \varphi_3[m(\text{Re }s)(1-r)] + \varphi_4 Z \qquad (7)$$

Notice that and increase in $[m(Res)]$ will decrease ρ and hence shift out the CC curve; and an increase
in Z will increase ρ and hence shift in the CC curve.

The LM curve is given by:
$$R = \frac{\mu}{h} - \frac{1}{h}\left(\frac{m(\text{Re }s)}{P}\right) + \frac{k}{h}Y \qquad (4)$$

Notice that like the standard IS-LM model, the LM curve is shifted out by anything that increases
$[m(Res)]$. For problems 2.1-2.3, we are assuming the Fed does *not* pay interest on excess reserves.

2.1 Show what happens if the investment projects that are funded by loans suddenly look more "risky"
    than they used to (e.g., loans for buying houses or loans for building shopping malls). Assume the
    initial interest rate is positive.

2.2 Show what happens if the Fed increases the amount of reserves in the economy by undertaking
    open market operations. Assume the initial interest rate is positive.

2.3 Now assume the initial interest rate is zero. Show what happens if the Fed increases the amount of
    reserves in the economy by undertaking open market operations. Explain, using the graph.

2.4 Suppose the Fed pays interest on excess reserves so that an increase in reserves does not increase
    the money supply and deposits. Do you get the same answer that you get in 2.3?

3. Suppose the economy is initially described by the following equations (aggregate demand and price adjustment, respectively):

$$Y_t^{AD} = 3401 + 2.888\left(\frac{M_t}{P_t}\right)$$

$$\frac{P_t - P_{t-1}}{P_{t-1}} \equiv \pi_t = 1.2\left(\frac{Y_{t-1} - 6000}{6000}\right)$$

Where $M_t = 900$ for time period t = 1, and potential GDP is $Y_t^* = 6000$.

3.1 Plot the aggregate demand curve and the *long run* aggregate supply curve. Explain why the aggregate demand curve is not a straight line.

3.2 If $P_t = 0.5$ for period t = 1, then what is Y_1? Does this place upward or downward pressure on prices?

3.3 Compute the path of the economy – that is, calculate GDP, the price level, and inflation -- for each year until GDP is within 1 percent of potential.

3.4 Diagram the economy's path on the demand curve plotted in part 4.1. The, draw your own version of Figures 9.3 and 9.4. (You may assume that inflation was initially zero, i.e., $\pi_t = 0$ for t= 0, and for t=1.

3.5 Assume now that the inflation process is given by $\pi_t = \pi_{t-1} + 1.2\left(\frac{Y_{t-1} - 6000}{6000}\right)$. Compute the path of the economy for the first fives years, and diagram the economy's path as in part 4.4. Now is there overshooting?

3.6 What does the π_{t-1} term in the price adjustment equation in part 4.5 represent? Explain the relationship between this term and overshooting.

4. Textbook Chapter 9, Analytical Question #3.