

### Problem Set 4

Due *in lecture* on Wednesday, December 7th. Be sure to put your name on your problem set. Put “boxes” around your answers to the algebraic questions.

1. Consider a Taylor rule of the following form:

$$i_t^{FedFunds} = \pi_t + 0.5 \times (y_t - y_t^*) + 0.5 \times (\pi_t - \pi_t^*) + r_t^*$$

1.1 Calculate the implied Fed funds rate for 2015Q3, assuming the equilibrium real rate is 2.0%, and target inflation rate is 2%. You will need to obtain information on the output gap and inflation rate. Show your work.

You can obtain information St. Louis Fed FRED system on potential GDP and actual GDP, to calculate the output gap. You can also obtain data for personal consumption expenditure deflator inflation from there as well (use four quarter inflation in your calculations).

1.2 Show what happens if the target inflation rate is raised to 4%.

2. Consider the definition of the exchange rate,  $E$  as the number of euros required to purchase a single US dollar.

2.1 In the long run, what should determine the exchange rate? Suppose the  $P$  denotes the US price level, and  $P^w$  the price in the euro area. Write out the answer algebraically.

2.2 The real exchange rate is the number of European widgets necessary to purchase a single US widget; write out the real exchange rate, algebraically.

2.3 When the exchange rate rises (the dollar gets stronger) what happens to the real exchange rate, *if prices are sticky*?

3. Consider a CC-LM model as laid out in the Bernanke-Blinder article.

3.1 Show what happens, graphically, if the Fed undertakes open market operations, by buying Treasury bonds.

3.2 Explain the economics behind why the curve(s) shift(s).

4. Suppose the demand for reserves is stable. Use a graph of the market for Bank Reserves to show how the Open Market Trading Desk would implement a decision by the FOMC to raise the target federal funds rate. You should assume that the discount and deposit rates are adjusted so that the spreads between them and the target federal funds rate are maintained.

5. Suppose, one morning, the Open Market Trading Desk drastically under-estimates the demand for reserves when deciding the quantity of reserves to supply to the market. Use the graph of the Market for Bank Reserves to show why the market federal funds rate will not exceed the discount rate regardless of how large the gap between estimated and actual reserve demand.