

**Problem Set 3**

Due in Lecture on Wednesday, April 1<sup>st</sup>. "Box-in" your answers to the algebraic questions.

**1. Policy under Fixed Exchange Rates in the IS-LM-BP=0 model**

Suppose the economy is given by the following set of equations.

$$(13) \quad Y = \bar{\alpha}[\bar{A} + \overline{EXP} - \overline{IMP} + (n + v)q - bi] \quad \text{<IS curve>}$$

$$(13') \quad i = \frac{\bar{A} + \overline{EXP} - \overline{IMP} + (n + v)q}{b} - \left( \frac{1 - c(1 - t) + m}{b} \right) Y \quad \text{<IS curve>}$$

Where  $\bar{A} \equiv \bar{CO} - b\bar{TA} + b\bar{FT} + \bar{IN} + \bar{GO}$

$$(14) \quad i = \frac{\mu}{h} - \left( \frac{1}{h} \right) \left( \frac{\bar{M}}{P} \right) + \left( \frac{k}{h} \right) Y \quad \text{<LM curve>}$$

$$(15) \quad i = - \left( \frac{1}{\kappa} \right) [(\overline{EXP} - \overline{IMP} + \bar{KA}) + (n + v)q] + \bar{i}^* + \left( \frac{m}{\kappa} \right) Y \quad \text{<BP=0 curve>}$$

- 1.1 Draw a graph of initial equilibrium, where the goods and money markets are in equilibrium, as is the balance of payments. Assume that  $m/\kappa > k/h$ .
- 1.2 Show what happens if the government decreases government spending by  $\Delta GO$ , both immediately, and over time in the absence of central bank sterilization. Note, the money base changes by an amount equal to the change in foreign exchange reserves,

$$(16) \quad \Delta MB = \Delta Res = BP = -ORT$$

- 1.3 Answer 1.2, assuming the central bank sterilizes changes in official reserves. At the new equilibrium, what is true about (i) the level of output; (ii) the level of investment; (iii) the real exchange rate; and (iv) the trade balance?
- 1.4 Redraw 1.1, and show the impact of a monetary contraction, both immediately and over time. Assume over time, capital flows are sterilized.
- 1.5 Explain why the process you lay out in 1.4 occurs.
- 1.6 Answer 1.4 if capital flows are *not* sterilized.

## 2. Policy under Floating Exchange Rates in the IS-LM-BP=0 model

Suppose the exchange rate is floating.

- 2.1 Assume the economy described above is under a floating exchange rate regime. Show graphically what happens if the government decreases government spendings.
- 2.2 Explain your answer to 2.1.
- 2.3 Now examine a monetary contraction from initial equilibrium, carefully distinguishing between initial impact, and the effect over time.
- 2.4 Explain why monetary policy has a larger effect in this open economy as opposed to that in a closed economy.

## 3. Shocks under Floating Exchange Rates in IS-LM-BP=0

- 3.1 Suppose foreign income falls. Further assume the foreign country is large relative to the home country, so that the impact on the home country can be represented as a reduction in  $\overline{EXP}$ . Trace out the impact on the home economy, using a graph.
- 3.2 Could the home economy offset the impact of the foreign income shock using monetary policy? If yes, show how the proposed policy would operate, graphically.
- 3.3 Could the foreign country seek to nullify the impact of the home country's monetary policy?

## 4. Purchasing power parity

In the following questions, show your work.

Consider absolute purchasing power parity, in logs (i.e., where lowercase letters denote logged values of uppercase letters):

$$s_t = p_t - p_t^*$$

- 4.1 Explain what happens to the exchange rate if the foreign price level falls by 5%.
- 4.2 Suppose only *relative* PPP holds,  $s_t = p_t - p_t^* - \kappa$ . Answer again 4.1.
- 4.3 If relative PPP holds, what must be true when US *inflation* is 3% and foreign inflation is -2%?