

Problem Set 4

Due **in Lecture** on Wednesday, April 27th. "Box-in" your answers to the algebraic questions.

1. Policy in IS-LM model with the $TB=0$ curve.

Recall the definition of the trade balance is:

$$(13) TB \equiv EX - IM$$

1.1 Using the export and import functions, solve for the $TB=0$ curve (Y on the left hand side).

1.2 Draw the IS-LM-TB=0 graph, assuming that the economy is in initial internal and external equilibrium.

1.3 Show graphically the initial effect of an decrease of government transfer spending by ΔGO . Clearly indicate the distance of the curve shifts and the amount of the income change.

1.4 Over time, the money base changes by an amount equal to the change in foreign exchange reserves,

$$(14) \Delta MB = \Delta Res = BP = -ORT$$

where in this simple model without any private capital inflows, $BP=TB$. Show what happens to the curves over time.

1.5 Explain what has happened to the composition of output after adjustment is complete.

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

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

$$(1) \quad Y = \bar{\alpha}[\bar{A} + \bar{EXP} - \bar{IMP} + (n + v)q - bi] \quad \text{<IS curve>}$$

$$(1') \quad i = \frac{\bar{A} + \bar{EXP} - \bar{IMP} + (n + v)q}{b} - \left(\frac{1 - c + m}{b}\right)Y \quad \text{<IS curve>}$$

$$(2) \quad i = -\left(\frac{1}{h}\right)\left(\frac{\bar{M}}{P}\right) + \left(\frac{k}{h}\right)Y \quad \text{<LM curve>}$$

$$(3) \quad i = -\left(\frac{1}{\kappa}\right)[(\bar{EXP} - \bar{IMP} + \bar{KA}) + (n + v)q] + \bar{i}^* + \left(\frac{m}{\kappa}\right)Y \quad \text{<BP=0 curve>}$$

2.1 Draw a graph of initial equilibrium, where the goods and money markets are in equilibrium, as is the balance of payments. Assume that $m/\kappa < k/h$, but $\kappa < \infty$.

- 2.2 Show what happens if the government decreases government spending on goods and services ($\overline{G\overline{O}}$), both immediately, and over time.
- 2.3 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.
- 2.4 Redraw 2.1, and show the impact of a monetary contraction, both immediately and over time. Assume over time, capital flows are sterilized.
- 2.5 Explain why the process you lay out in 2.4 occurs.
- 2.6 Answer 2.4 if capital flows are not sterilized.
- 2.7 Does your answer to 2.5 change if $m/\kappa > k/h$?

3. Policy under Floating Exchange Rates

- 3.1 Now assume the economy you depicted in 2.1 is under a *floating* exchange rate regime. Show what happens if the government cuts government spending.
- 3.2 Explain your answer to 3.1.
- 3.3 Now examine a monetary expansion from initial equilibrium, carefully distinguishing between initial impact, and the effect over time.
- 3.4 Is this effect of monetary policy bigger or smaller than in the fixed exchange rate case?

4. Shocks

- 4.1 Assume the economy depicted in 2.1 experiences a fall in the foreign interest rate i^* . Show what happens under *fixed* exchange rates, if capital flows are not sterilized.
- 4.2 Now show what happens if the economy is under *floating* exchange rates.
- 4.3 Suppose that exports depend upon rest-of-world GDP:

$$EX = \overline{EXP} + vq + m^* Y^*$$

so that the BP=0 schedule is given by:

$$i = -\left(\frac{1}{\kappa}\right)[(\overline{EXP} - \overline{IMP} + \overline{KA}) + (n+v)q] + \bar{i}^* + \left(\frac{m}{\kappa}\right)Y - \left(\frac{m^*}{\kappa}\right)Y^*$$

and the IS curve by:

$$i = \frac{\overline{A} + \overline{EXP} - \overline{IMP} + (n+v)q + m^* Y^*}{b} - \left(\frac{1-c+m}{b}\right)Y$$

Show graphically what happens to home economy GDP under floating exchange rates.