Problem Set 3

Due in Lecture on Monday, March 26th. Box in your answers to the algebraic questions.

1. Policy under Fixed Exchange Rates

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

\[ Y = \bar{\alpha}[\bar{A} + \bar{EXP} - \bar{IMP} + (n + v)q - bi] \]  
\[ i = \frac{\bar{A} + \bar{EXP} - \bar{IMP} + (n + v)q}{b} - \left( \frac{1 - c(1 - t) + m}{b} \right)Y \]

\[ i = -\left( \frac{1}{h} \right) \left( \frac{M}{P} \right) + \left( \frac{k}{h} \right)Y \]

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

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 cuts the tax rate, both immediately, and over time, assuming no sterilization.

1.3 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.

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.

1.7 Does your answer to 1.5 change if \( m/\kappa > k/h \)?

2. Policy under Floating Exchange Rates

2.1 Now assume the economy you depicted in 1.1 is under a floating exchange rate regime. Show what happens if the government cuts government spending.

2.2 Explain your answer to 2.1.

2.3 Now examine a monetary expansion 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

3.1 Assume the economy depicted in 1.1 experiences a rise in the foreign interest rate \( i^* \). Show what happens under fixed exchange rates, if capital flows are not sterilized.

3.2 Now show what happens if the economy is under floating exchange rates.

3.3 Suppose that exports depend upon rest-of-world GDP:

\[
EX = EXP + vq + m^*Y^*
\]

so that the BP=0 schedule is given by:

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

and the IS curve by:

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

Now answer 3.2 assuming that when \( i^* \) rises, \( Y^* \) falls.

3.4 What is the net effect on output? Can you determine what happens to the trade balance?

4. Aggregate Demand and Aggregate Supply

Suppose output is below potential, or full employment, GDP in both periods 0 and 1. Further assume the price level has been constant at \( P_0 = P_1 \).

4.1 Consider what happens if oil prices double in period 2. Show the impact on output and the price level, both in the short run, and over time. You can assume \( P_t^* = P_{t-1} \).

4.2 Suppose instead of the expected price level equaling the lagged price level, the following holds true: \( \pi_t^* = \pi_{t-1} \). Answer 2.1, for periods 2, and 3.