Problem Set 4

Due in lecture on Tuesday, December 1st. **Thursday, December 3rd**. Be sure to put your name on your problem set. Put “boxes” around your answers to the algebraic questions.

1. Textbook Chapter 10, Numerical Question #2

2. Textbook Chapter 11, Numerical Question #1.

3. Textbook Chapter 11, Analytical Question #5.


5. Suppose you are given the real side of an open economy as:

\[
Y = AD
\]

\[
AD \equiv C + I + G + X
\]

\[
C = a_0 + bY_d
\]

\[
Y_d \equiv Y - T + F
\]

\[
T = TA_0
\]

\[
F = FT_0 - \psi Y
\]

\[
I = e_0 - dR
\]

\[
G = GO_0
\]

\[
X = g_0 - mY + m_wY_w - n\left(\frac{EP}{P_w}\right)
\]

\[
\frac{EP}{P_w} = q_0 + vR
\]

5.1. Solve for the open economy IS curve \((Y \text{ as a function of } R)\).

5.2. Solve for equilibrium income.

5.3 Show graphically what happens if foreign income falls *exogenously*. What is the economic intuition for this result?

5.4 Using total differentials, show the impact of an increase in money supply on income.

5.5 Using the previous result (and the LM curve), show the impact of an increase in money supply on the interest rate.

5.6 Consider the quasi-reduced form expression for the trade balance (net exports):

\[
X = g_0 - mY + m_wY_w - nq_0 - nvR
\]

Determine the impact of an increase in money supply on the trade balance.

5.7. Consider the government’s budget balance:

\[
BuS \equiv T - G - F = TA_0 - GO_0 - FT_0 + \psi Y
\]

Determine the impact of an increase in money supply on the budget balance. Do the two balances move together?
6. Consider the overshooting model described at the end of the open economy macro handout.

6.1 Suppose the rate of reversion to purchasing power parity, $\Theta$, becomes infinite. What happens to the price level, the exchange rate and interest rate when the money supply in the U.S. is increased by 10%. Use the time line graph to illustrate your answer.

6.2 What is this rate of reversion coefficient dependent upon?

6.3 Does purchasing power parity hold in this world?

7. Recall that the real exchange rate relationship

$$\frac{E_P}{P_w} = q_0 + vR$$

Stands in for this underlying relationship:

$$\frac{E_P}{P_w} = \left( \frac{E_{LR} P}{P_w} \right) \times \left( \frac{(1-\gamma) R - R_w}{\Theta} \right) + \frac{E_{LR} P}{P_w}$$

Which relies upon uncovered interest parity (UIP), the condition that expected returns expressed in a common currency are the same in the two countries:

$$R - R_w = \frac{\Delta E_u}{E} \equiv - \frac{E_{u,t}^* - E}{E} < UIP$$

Suppose instead of this condition, American assets required a risk premium, $\rho$, to be held, perhaps because they are viewed as more risky than foreign assets (or less risky, when $\rho < 0$):

$$R - R_w = \frac{\Delta E_u}{E} \equiv - \frac{E_{u,t}^* - E}{E}$$

7.1. Work out what the new expression for the real exchange rate/interest rate equation.

7.2 What happens to the dollar if American assets suddenly look more risky?

7.3 What happens to income as a consequence of the dollar becoming more risky?