Problem Set #5 ANSWERS

Due Tuesday, April 29, 2008

Problem Sets MUST be word-processed except for graphs and equations.

When drawing diagrams, the following rules apply:

1. Completely, clearly and accurately label all axes, lines, curves, and equilibrium points.

2. The original diagram and any equilibrium points MUST be drawn in black or pencil.

3. The first change in any variable, curve, or line and any new equilibrium points MUST be drawn in red.

4. The second change in any variable, curve, or line and any new equilibrium points MUST be drawn in blue.

5. The third change in any variable, curve, or line and any new equilibrium points MUST be drawn in green.
A. Multiple Choice Questions. Circle the letter corresponding to the best answer. (1 points each.)

1. Which of the following would be part of the nation’s capital and financial account?
   a. A night club show seen by an American in Mexico City.
   b. A dividend from a British equity owned by an American.
   c. A payment to the Philippine government for the use of military bases in their country.
   d. One hundred shared of British Petroleum stock purchased by an American.

2. A small open economy increases its investment demand. This causes the world real interest rate to ______ and the country’s current account balance to ______.
   a. Rise; fall.
   b. Remain unchanged; rise.
   c. Rise; rise.
   d. Remain unchanged; fall.

3. A large open economy reduces its investment demand. This causes the world real interest rate to ______ and the country’s current account balance to ______.
   a. Rise; fall.
   b. Rise; rise.
   c. Fall; rise.
   d. Fall; fall.

4. Assume that an increase in Costa Rica’s government budget deficit reduced desired national saving by 10 million colon (the Costa Rican currency). Assuming Costa Rica is a small open economy, you would expect the government’s action to:
   a. Increase the current account balance by exactly 10 million colon.
   b. Increase the current account balance by less than 10 million colon.
   c. **Reduce the current account balance by exactly 10 million colon.**
   d. Reduce the current account balance by more than 10 million colon.

5. From 1980 to 2000, the ye/dollar exchange rate fell from 240 yen/dollar to 102 yen/dollar, while the dollar pound exchange rate fell from 2.22 dollars/pound to 1.62 dollars/pound. As a result,
   a. The dollar appreciated relative to the yen but depreciated relative to the pound.
   b. **The dollar depreciated relative to the yen but appreciated relative to the pound.**
   c. The dollar appreciated relative to both the yen and the pound.
   d. The dollar depreciated relative to both the yen and the pound.
6. If the real exchange rate raised 2%, domestic inflation is 3%, and foreign inflation is 1%, what is the percent change in the nominal exchange rate?
   a. 6%.
   b. 4%.
   c. 2%.
   d. 0%.

7. There has been a real depreciation of the dollar over the past month. In the long-run, you would expect the quantity of:
   a. American imports to fall and the quantity of American exports to fall.
   b. American imports to rise and the quantity of American exports to rise.
   c. American imports to fall and the quantity of American exports to rise.
   d. American imports to rise and the quantity of American exports to fall.

8. An increase in domestic output would cause a ______ in net exports and a ______ in the exchange rate.
   a. Rise; rise.
   b. Rise; fall.
   c. Fall; rise.
   d. Fall; fall.

9. A decrease in the foreign real interest rate would cause the domestic country’s net exports to ______ and cause the domestic country’s IS curve to ______.
   a. Rise; shift to the right.
   b. Rise; shift to the left.
   c. Fall; shift to the right.
   d. Fall; shift to the left.

10. If a country has an overvaluation problem, the best solution is to:
    a. Increase the official rate.
    b. Buy less of its currency in the foreign exchange market.
    c. Sell more of its currency in the foreign exchange market.
    d. Decrease the money supply.
B. Answer BOTH of the following questions. (10 points each.)

1. **$S^d - I^d$ Open Economy Model.** Suppose that the world economy is composed of only two large, open-economy countries—the United States and China—and that the U.S. is running a substantial current account deficit.

   Because of xenophobic fears, the Chinese government then imposes strict capital controls that prevent Chinese residents and institutions from either borrowing or lending abroad.

   a. Based only on this information, use a 2-country $S^d - I^d$ Open Economy diagram to accurately and clearly show:

   1. The **initial** equilibrium situation in both countries (in black),
   2. The short-run effects on national saving, desired investment, the current account balance, and real interest rates in both the U.S. and China from this policy change (in red),
b. Provide a **brief economic explanation** for the changes you showed in your diagrams above. Be sure to **compare** the current account balances and real interest rates between the initial and final short-term equilibrium situations for both countries.

Initially, before capital controls are imposed, the world interest rate is at \( r^* \).

The United States has a current account deficit, measured as the negative difference between its national saving and desired investment at the world interest rate. This indicates that the U.S. is borrowing from China.

China has a current account surplus, measured as the positive difference between its national saving and desired investment at the world interest rate. This indicates that China is lending to the U.S.

China’s current account surplus exactly equals the United States current account deficit.

After China imposes capital controls, each country must internally finance all of its desired investment, i.e., interest rates must move to equilibrate national saving and desired investment.

Because the United States was borrowing internationally (before capital controls were imposed), domestic interest rates will rise in order to increase national saving and reduce desired investment. Once national saving and desired investment equilibrate, the current account balance will be zero.

Because China was lending internationally (before the capital controls were imposed), domestic interest rates will fall in order to reduce national saving and increase desired investment. Once national saving and desired investment equilibrate, the current account balance will be zero.

Comparing the initial and final equilibrium situations: For the United States, domestic interest rates are higher and the initial current account deficit has disappeared. For China, domestic interest rates are lower and the initial current account surplus has disappeared.
2. **Open Economy IS-LM Model with the Foreign Exchange Market.** France and Germany are major trading partners with flexible exchange rates. Because Germany is experiencing accelerating inflation, the Bundesbank (Germany’s central bank), engages in a contractionary monetary policy.

a. Based only on this information, use a 2-country, open economy IS-LM model with an Foreign Exchange Market diagram to accurately and clearly show:

1. The initial general equilibrium situation in both countries (in black),
2. The short-run effects on economic output, the real interest rate, and the nominal and real exchange rates in both France and Germany from the Bundesbank’s monetary contraction (in red).
b. Provide a brief economic explanation for the changes you showed in your diagram above. Be sure to compare the level of economic output, the real interest rate, and the nominal and real exchange rates between the initial and short-run equilibrium situation in both countries.

Both Germany and France are initially in equilibrium with economic output at $Y_0$ and with the real interest rate at $r_0$.

Germany’s contractionary monetary policy shifts its LM curve to the left from $LM_0$ to $LM_1$. This causes the real interest rate to increase from $r_0$ to $r_1$. The increase in the real interest rate reduces interest-sensitive spending and economic output falls from $Y_0$ to $Y_1$.

The decrease in Germany’s economic output from $Y_0$ to $Y_1$ also reduces Germany’s imports and, therefore, increases its net exports. A decrease in imports causes a reduction in the supply of German Deutschmarks in the foreign exchange market, shifting the supply curve to the left from $S_0$ to $S_1$.

The increase in Germany’s real interest rate from $r_0$ to $r_1$ increases the demand for German Deutschmarks in the foreign exchange market, shifting the demand curve to the right from $D_0$ to $D_2$. The higher real interest rate also decreases the supply of German Deutschmarks in the foreign exchange market, shifting the supply curve to the left from $S_1$ to $S_2$.

As a result of these changes in the foreign exchange market the German Deutschmark will appreciate, both in nominal and real terms in the short run, from $P_0$ to $P_1$.

The appreciation of the Deutschmark will make French imports less expensive and increase German imports. However, the decline in imports from the decline in German economic output has a larger effect than the increase in imports from the appreciation of the German currency. Consequently, German imports decline and net exports increase.

If German net exports increase, French net exports must decrease. This causes the French IS curve to shift to the left from $IS_0$ to $IS_1$. As a result, French economic output declines from $Y_0$ to $Y_1$ and French interest rates decline from $r_0$ to $r_1$.

The net effect of all of these changes in the short run are: Both Germany and France have lower levels of economic output. Germany has a higher real interest rate while France has a lower real interest rate. The German Deutschmark has appreciated in both nominal and real terms while the French Franc has depreciated in both nominal and real terms.

[In the long-run, of course, the price level in Germany will adjust to being the economy back to its full-employment output level so there will be not permanent effect on real variables, including the real exchange rate.]
Now suppose that instead of having had flexible exchange rates, France had fixed its exchange rate with Germany at its fundamental value, a level that France is committed to maintaining.

c. Based only on this information, use a 2-country, open economy IS-LM model with an Foreign Exchange Market diagram to accurately and clearly show:

3. The initial general equilibrium situation in both countries (in black),

4. The short-run effects on economic output, the real interest rate, and the nominal and real exchange rates in both France and Germany from the Bundesbank’s monetary contraction (in red),
d. Provide a brief economic explanation for the changes you showed in your diagram above. Be sure to discuss how France must respond to Germany’s monetary contraction to maintain the fixed exchange rate. Also discuss what happens to France’s economic output, real interest rate, real exchange rates, and net exports in the short run assuming that France is successful in maintaining the fixed exchange rate at its initial fundamental value.

The first part of this section is exactly the same as in part a and b.

However, if France wants to offset Germany’s contractionary monetary policy to keep it from affecting the exchange rate, France must also use a contractionary monetary policy.

When Germany uses a contractionary policy it causes France’s IS curve to shift to the left because its net exports must decline. To prevent its nominal exchange rate from declining, France must itself use a contractionary monetary policy to shift its LM curve to the left from LM₀ to LM₂. The contractionary monetary policy causes France’s economic output to decline from Y₁ to Y₂ and its real interest rates to increase from r₁ to r₂.

The decrease in France’s economic output from Y₁ to Y₂ also reduces France’s imports (or Germany’s exports). This decrease in France’s imports causes a decline in the demand for German Deutschmarks in the foreign exchange market, shifting the demand curve to the left from D₂ to D₃.

The increase in France’s real interest rate from r₁ to r₂ increases the supply of German Deutschmarks in the foreign exchange market, shifting the supply curve to the right from S₂ to S₃. The higher French real interest rate also reduces the demand for German Deutschmarks in the foreign exchange market, shifting the demand curve to the left from D₃ to D₄.

As a result of these various changes in the foreign exchange market, the nominal exchange rate will be unchanged. Because the price levels in each country do not change in the short run, the real exchange rate is also unchanged.

The effect on net exports is ambiguous. Both France and Germany have declines in economic output, so the effect on net exports depends on the sensitivity in each country of net exports to changes in economic output.