Problem Set 5 Answers

14.02 Fall 2001

1 True or false, explain

1. False. It is true for gross exports, since a real devaluation makes domestic goods cheaper and hence increases the demand for them. For net exports it is only true if the Marshall-Lerner conditions are met.

2. False, expansive fiscal policies increase the interest rate making domestic bond prices fall and hence making them more atractive for investors. A revaluation of the currency follows.

3. False. Under fixed exchange rates, the increase in demand caused by the government is magnified due to the increase in money supply that is required to keep interest rates at international levels.

4. False With fixed exchange rates, money supply must be contracted to maintain the interest rate at the international level importing the whole of the international recession into the country. However, government spending can compensate any fall in exports without any change in money supply.

5. False, the difference between the two must also be larger than the percentage change in the real exchange rate.

6. True. This is what is stated by the Marshall-Lerner Condition.

2 Policy Abroad Questions

1. Abroad, the money market will have very different equilibrium interest rates for levels of income that will be only slightly different. The LM will be very steep.

2. Since the LM is steep an expansionary fiscal policy abroad will increase the international interest rate with no impact on foreign output. In the foreign money market, money demand has expanded swiftly driving interest rates up. In the foreign goods market, the excess demand created by the government abroad is compensated by a fall in investment. There is no effect on the demand for domestic exports. However, since the exchange rate is fixed, domestic interest rates must go up and domestic demand for investment will fall.

3. Abroad the LM will be very flat. Any money that the foreign central bank issues does not expand saving but, rather, is stored by the agents.

4. Now fiscal policy does not increase interest rates at all. Increased demand is met by an increase in foreign output. Hence, domestic exports increase.

5. The IS will be very steep. If income increases and money demand drives interest rates up, investment does not fall, so any interest rate is consistent with equilibrium in the goods market for a level of output.

6. Nothing, reasoning is similar to 2. The international interest rate falls and foreign income remains fixed. The exchange rate is fixed, so the interest rate falls in the domestic economy, increasig investment but exports will not move.

7. Consumer confidence abroad is contracting foreign output and hence their demand for our exports. This contracts our demand and hence contracts domestic output. Abroad, interest rates will fall, with fixed exchange rates the domestic demand for investment increases. The net effect on the demand for domestic goods is ambiguous. If it had a negative effect we can devalue. If we devalue, we can compensate partially the contraction of demand by increasing the competitiveness of our exports.

8. If the nominal exchange rate is fixed, inflation abroad will depreciate the real exchange rate making our exports more competitive. There is no need to devalue the currency to protect our competitive position.

3 Trade Policy Questions

1. The behavioral equation for the quantity of imports would become something like.

$$Q=\left\{\begin{array}{cc} q_0Y-q_1\epsilon \text{ if } Q<\overline{Q} \\ \overline{Q} \qquad \text{otherwise} \end{array}\right\}$$

Equilibrium would not necessarily be affected. Since exchange rates and prices are fixed in this economy for the quotas to kick in we must be at a level of output that puts imports over the critical threshold. Lets call that critical level of output $\overline{Y}$.

2 The ZZ and AA schedules will have a kink at $\overline{Y}$ where they start to increase with the same slope as DD, for lower levels of output the slope will be lower since increases in output will increase the proportion of domestic demand that satisfies itself with imports. Hence, the NX curve also has a kink at the same point. When quotas limit the amount of imports, demand is deviated towards domestic producers. Consequently the increase in the trade deficit is smaller.

[See figure 1]

3 The expansive fiscal policy pushes the ZZ curve up. If the expansive fiscal policy pushes the equilibrium output of the economy over $\overline{Y}$, the quotas will kick in. Output will expand more with the quotas, since less demand will be deviated abroad.

[See figure 2]

4 Now that we know that there is a critical level of Y for the quotas to kick in, the behavioral equations can be written as.

$$Q=\left\{\begin{array}{cc} q_0Y-q_1\epsilon \text{ if } Y<\overline{Y} \\ \overline{Q} \qquad \text{otherwise} \end{array}\right\} \text{ and } X=\left\{\begin{array}{cc} x_0Y^*+x_1\epsilon \text{ if } Y<\overline{Y} \\ 0 \qquad \text{otherwise} \end{array}\right\}$$

5 The schedules will have the same kinks as in 2, only now the ZZ schedule will have a discrete drop at $\overline{Y}$. At this level of output, since exports are being blocked, the AA schedule and the ZZ schedule will be the same. From then onwards the ZZ increases with the quota slope.

[See figure 3]

6 ZZ with its kink and its discrete fall increases. Compared to 3, the increase in output is lower. Compared to the situation with no quota (and no retaliation), it will depend on the increase in G. For small increases, the protective effect does not compensate the fall in exports. For very high expansions of G, the increase in domestic demand deviated from imports exceeds the fall due to exports.

[See figures 4 and 5]

4 Exchange Rate Questions

1. A fall in consumer confidence in the US, lowers Y* and i* for Mexico, since the US IS is contracting. With fixed exchange rates this lowers the equilibrium Mexican interest rate and lowers Mexico's exports. There is a contraction of the IS and a fall in the interest rate that Mexican Central bank must strive for in order to keeep the exchange rate fixed. If the fall in exports is very large (the case of Mexico) the CB may have to contract money supply to maintain the exchange rate. If the contraction in exports were lower, the CB may have to increase money supply eventually In the short run, if the contraction of exports is small, the CB will make a sharp expansion in money supply to adjust the interest rate to the new international level (CB Response).Afterwards, the CB will slowly increase supply as output adjusts to its new –and higher– level (CB Adjustment). If the fall in exports was high, the response of the CB is to expand the money supply immediately (to lower i) but then to contract money supply to avoid the devaluation of the currency as the economy sluggishly contracts to its new equilibrium.

   [See figures 6 and 7]

2. As the CB is doing its adjustment money, international interest rates fall. To adjust the domestic interest rate and keep the exchange rate fixed the CB has a new sharp reaction by increasing the money supply. In the case of figure 6, there will be an additional expansive adjustment of monetary policy as output adjusts. In the case of figure 7 there could be additional contractive adjustments or –as we show– a reversal to expnasive adjustments after the CB reaction. When the US implements the fiscal stimulus, international interest rates go up and the IS expands (with the increase in Mexican exports). The mechanics are the same as in figures 6 and 7 but in the reverse direction.

   [See figures 8 and 9]

3 If prices rise in Mexico the real exchange rate apreciates and the IS falls back as net foreign demand for domestic goods falls. there is pressure lowering the domestic interest rate and hence pushing for a devaluation of the currency. In the fixed exchange rate regime the CB would contract money supply until there is no pressure on interest rates. If the CB allows theinterest rate to fall and the currency to devalue the IS will expand, since the nominal exchange

rate will be partly offestting the loss of competitivenes in the real exchange rate.If there is a possibility that this will happen, Mexicans will have some expectations that the CB will soon devalue and this will push domestic interest rates up.In other words, while the government decides, there will be some depreciation expectations as the public waits for the decision. Interest rates in Mexico will therefore increase transitorily.

4 If they change to a flexible exchange rate regime the exchange rate will depreciate, regaining some of the competitivieness lost with inflation. The IS will expand. If they decide to defend the nominal exchange rate, they will have to contract money supply and the economy with it.