

Economics Honors Exam 2009 Solutions: Macroeconomics, Questions 4-5

Question 4 (Macroeconomics, 30 points). The relationship between China and the United States is often in the news. To refresh your memory, here are four facts about the Chinese economy:

- China manages its exchange rate with the dollar.
- China runs a trade surplus with the United States.
- The Chinese central bank owns a large number of U.S. Treasury bills.
- Individual Chinese residents are not free to invest their savings in foreign countries as they would like. Any movement away from a managed exchange rate would probably include a relaxation of these restrictions.

Now evaluate the following claims below with three to five sentences for each. You should also feel free to use graphs or equations where appropriate. Your goal is to discuss why the claim is true, partially true, or not true at all.

- a. **(5 points)** “Cheap imports from China come at a steep cost – lost jobs and lower wages for American workers.”

Answer:

This statement is mostly false. In the long run, the number of jobs in the U.S. is determined by the position of the (essentially vertical) labor supply schedule. This means that the number of jobs does not depend on trade policy. Moreover, the theory of the comparative advantage indicates that trade makes countries better off, and thus the country as a whole is better off when receiving inexpensive goods from overseas. However, trade can make some workers worse off. Some workers will have to get new jobs or receive lower wages because of Chinese imports. So the statement could be altered to say that Chinese imports come at a steep cost to some U.S. workers, but not the country as a whole.

Points:

1 point for noting the statement is “mostly false”.

4 points for a well-illustrated answer.

Partial credit at the grader’s own judgement.

- b. **(5 points)** “Over time, the Chinese government can maintain an unfair trading relationship with the United States by pegging its currency to the dollar at a low level.”

Answer:

This statement is mostly false. In the long-run, a country's net exports (NX) are determined by its savings less investment ($S - I$), not by trade policy. The real exchange rate (ϵ) adjusts to bring this equality about. Because it is a real exchange rate, a country cannot peg ϵ in the long run. However, China may be able to peg the currency in the short run (while prices are sticky). If so, then the country might be able to affect trade flows over that horizon. Of course, whether you think this is "unfair" depends on your views of how imports affect the U.S. (as discussed in the previous quote).

Alternative answer: While it is true that China cannot peg its real exchange rate (ϵ) against the US dollar in the long run only via monetary policy, however, if it maintains capital controls, and decides to consistently invest in the U.S. via its sovereign wealth fund, then it can effectively guarantee a capital outflow from China into the U.S., which finances a consistent trade balance even in the long run with flexible prices.

Points:

Full credit for either of the alternative answers.

In the case of the first alternative answer:

1 point for noting the statement is "mostly false".

4 points for a well-illustrated answer.

Partial credit at the grader's own judgement.

c. (**5 points**) "In the long run, if China continues to peg its currency to the dollar at an abnormally low value, it may incur a significant increase in its price level."

Answer:

This statement is true. It is related to Claim b, in that it concerns the inability of the Chinese government to peg the real exchange rate in the long run. If the Chinese government is pegging the exchange rate at an abnormally low value, then it must be expanding the domestic money supply more than it otherwise would. Higher money tends to raise the price level, and this is the mechanism by which the *real* exchange rate would eventually rise. China may be able to forestall this increase in prices by "sterilizing" its foreign currency intervention, but in the long run, if the real exchange rate is to rise at a constant level of the nominal exchange rate, then

this must be accomplished by a rise in the Chinese price level relative to the U.S. price level.

Points:

1 point for noting the statement is “true”.

4 points for a well-illustrated answer.

Partial credit at the grader’s own judgement.

d. (**5 points**) “The only way for the United States to close its bilateral trade deficit with China is to either raise national savings in the U.S. or reduce investment in new plant and equipment in the U.S.”

Answer:

This statement is partially true. An increase in $S - I$ in the United States would close the U.S. multilateral trade deficit (that is, the total trade deficit run by the United States), but does not necessarily have to have an effect on the bilateral trade deficit that the U.S. runs with China. Of course, since China is a big trading partner with the U.S., a decline in the U.S. multilateral trade deficit would probably involve some shrinkages of the U.S.-China trade deficit as well. In any case, the only way for the U.S. to close the multilateral trade deficit is to raise $S - I$.

Points:

1 point for noting the statement is “partially true”.

4 points for a well-illustrated answer.

Partial credit at the grader’s own judgement.

e. (**5 points**) “Because China has a fixed exchange rate, it is unable to conduct discretionary monetary policy.”

Answer:

This statement is false. The “irreconcilable trinity” of open-economy macroeconomics is that a country must choose two options among the following three: A fixed exchange rate, the ability to perform discretionary monetary policy, and open capital markets. China has chosen the first two and has therefore imposed controls on the ability of its citizens to invest abroad (and on foreigners to invest directly in China). This means that it can pursue discretionary domestic monetary policy.

Points:

1 point for noting the statement is “false”.
4 points for a well-illustrated answer.
Partial credit at the grader’s own judgement.

f. **(5 points)** “If China stopped managing the value of its currency, the value of the China’s currency would strengthen relative to the dollar and U.S. interest rates would rise.

Answer:

This statement is partially true. This statement maps out one potential scenario for what would happen if China stopped managing its exchange rate with the United States. The Chinese central bank would reduce its purchases of U.S. Treasury bills, which would shrink the amount of Chinese currency that wants to turn itself into dollars. The dollar would fall at the same time that interest rates in the U.S. would rise (due to the decline in price of U.S. Treasury bills and the resulting increase in Treasury yields). However, if China relaxed its capital controls at the same time that it relaxed its peg, then individual Chinese residents would probably want to invest some of their savings abroad, including in dollar-denominated assets like U.S. bank accounts and the equity and debt of U.S. firms. This outflow of savings would be new source of Chinese currency that wanted to turn itself into dollars. Consequently, the U.S. dollar may not decline as much as some people have argued. The dollar might even strengthen.

Points:

1 point for noting the statement is “partially true”.
4 points for a well-illustrated answer.
Partial credit at the grader’s own judgement.

Question 5 (Macroeconomics, 30 points). Assume that, in the short run, there are two types of “shocks” which may cause the level of GDP to deviate from the long run, full employment level: (1) changes in autonomous investment spending; and (2) changes in autonomous money demand.

Explain how you reached your results for all the parts of this question (a. through d.). You should feel free to use graphs or equations where appropriate.

For all the parts of this question (a. through d.), analysis should be conducted for the short run only.

a. **(9 points)** Suppose that the Fed sticks to money supply targeting: in response to any investment spending or money demand shocks, the Fed will leave the money supply at the predetermined and targeted level. How will this money supply targeting strategy affect the deviations of output from the full employment level under each of the two types of shocks?

Answer:

For all the parts of this question (a. through d.), analysis is conducted for the short run, assuming the price level to be fixed at P . Prior to any shock to IS or LM , the economy begins at an output level of Y_0 and interest rate level of r_0 . See Figure 1.

Suppose that autonomous investment spending rises. Then IS shifts out to the right, to IS' , causing the interest rate to rise to r_1 and GDP to rise to Y_1 . Since the Fed is targeting the money supply and the money supply has not changed, there is no further change in output or the interest rate. See Figure 2. However, if instead the shock consists of a fall in autonomous money demand, then LM shifts out to the right, to LM' . This causes the interest rate to fall to r_1 and GDP to rise to Y_1 . Since the Fed is targeting the money supply and the money supply has not changed, there is no further change in output or the interest rate. See Figure 3.

Points:

- 1 point for noting that IS shifts out under shock (1).
- 2 points for noting that output (Y) increases under shock (1).
- 1 point for noting that LM shifts out under shock (2).
- 2 points for noting that output (Y) increases under shock (2).
- 3 points for a well-illustrated answer, preferably with graphs.
- Partial credit at the grader's own judgement.

b. **(9 points)** Now suppose that the Fed targets the interest rate: In response to any shocks, it adjusts the money supply to maintain the interest rate at its initial

targeted level. How will this interest rate targeting strategy affect the variations of output from the full employment level under each of the two types of shocks?

Answer:

Suppose that autonomous investment spending rises. Then IS shifts out to IS' , causing the interest rate to rise to r_1 and GDP to rise to Y_1 . Since the Fed is targeting the interest rate, to return interest rates to the targeted level of r_0 the Fed will increase the money supply, until LM shifts out to LM' . This will cause output to rise further, to Y_2 . See Figure 4. However, if instead the shock consists of a fall in autonomous money demand, then LM shifts out to LM' . This causes the interest rate to fall to r_1 and GDP to rise to Y_1 . Since the Fed is targeting the interest rate, to return interest rates to the targeted level of r_0 the Fed will reduce the money supply, until LM' shifts back to LM . This will also return output to the original level Y_0 . See Figure 5.

Points:

1 point for noting that IS shifts out under shock (1).

1 point for noting that the Fed responds by increasing money supply and thereby shifts out LM under shock (1).

1 point for noting that output (Y) rises further upon the Fed's reaction under shock (1).

1 point for noting that LM shifts out under shock (2).

1 point for noting that the Fed responds by reducing money supply and thereby shifts in LM under shock (2).

1 point for noting that output (Y) does not change under shock (1).

3 points for a well-illustrated answer, preferably with graphs.

Partial credit at the grader's own judgement.

c. (**6 points**) If the only source of "shocks" in the economy is autonomous investment spending, should the Fed stick to money or interest rate targets to best stabilize GDP?

Answer:

As shown above, under money supply targeting an increase in autonomous investment spending leads to output above full employment, but no additional change due to monetary policy. However, under interest rate targeting, in response to the increase in autonomous investment spending the Fed will increase the money supply and cause output to rise even further. If the only shocks are such autonomous

investment spending changes and the goal is to choose an operating strategy which keeps output nearest full employment, money targeting is best.

Points:

2 points for noting that money targeting is best.

4 points for a well-illustrated answer.

Partial credit at the grader's own judgement.

d. (**6 points**) If the only source of “shocks” in the economy is fluctuating autonomous money demand, should the Fed stick to money or interest rate targets to best stabilize GDP?

Answer:

As shown above, under money supply targeting a reduction in autonomous money demand leads to output above full employment, but no additional change due to monetary policy. However, under interest rate targeting, in response to the reduction in autonomous money demand the Fed will reduce the money supply and cause output to return to the original full employment level. If the only shocks are such autonomous money demand changes and the goal is to choose an operating strategy which keeps output nearest full employment, interest rate targeting is best.

Points:

2 points for noting that interest rate targeting is best.

4 points for a well-illustrated answer.

Partial credit at the grader's own judgement.

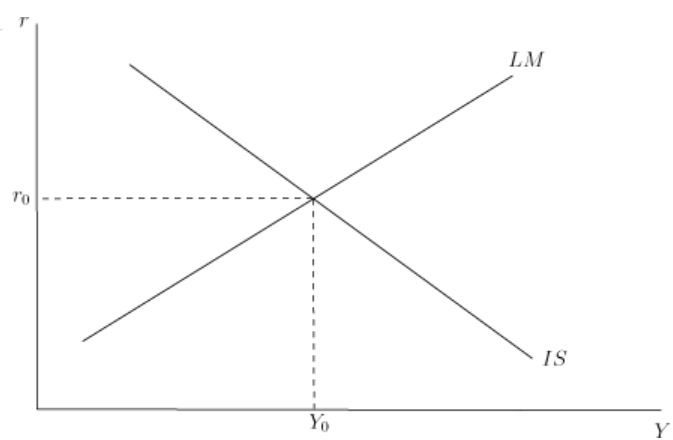


Figure 1: The initial position of the economy.

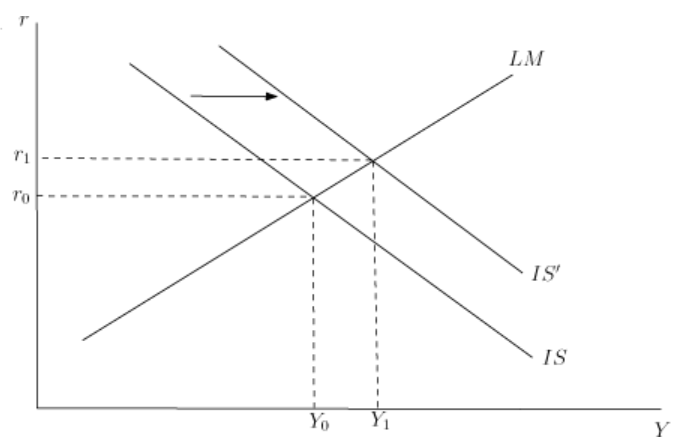


Figure 2: An increase in autonomous investment under money-supply targeting.

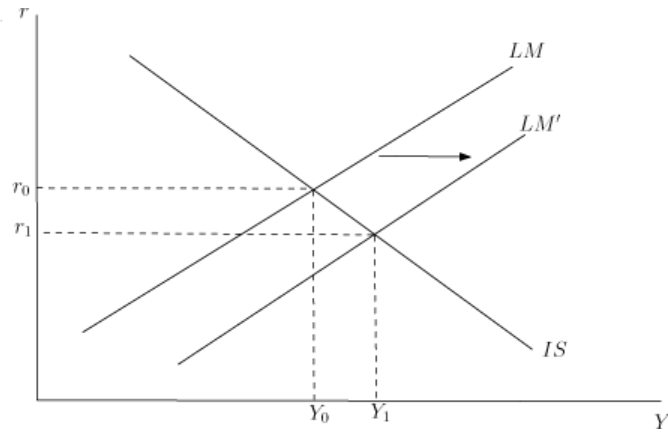


Figure 3: A decrease in autonomous money demand under money-supply targeting.

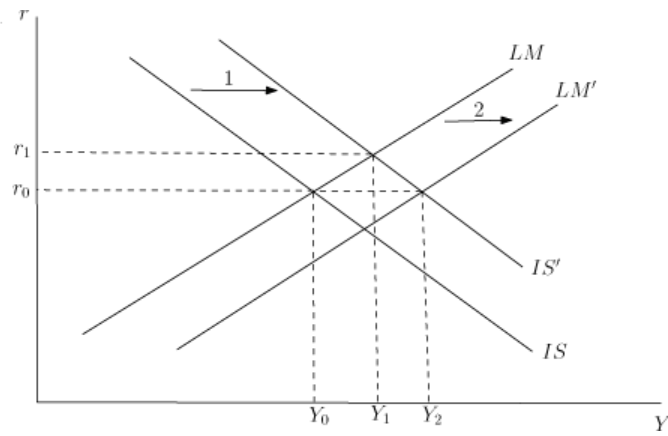


Figure 4: An increase in autonomous investment under interest-rate targeting.

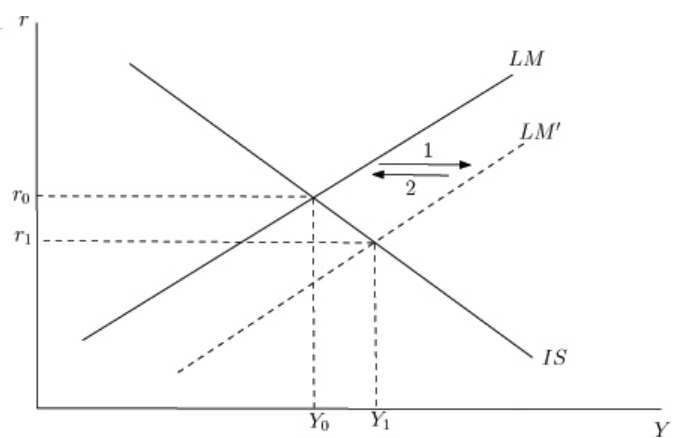


Figure 5: A decrease in money demand under interest-rate targeting.