

**2. Question 5 of Chapter 19 in the textbook. (7th edition, Flexible exchange rate and the response to changes in foreign macroeconomic policy).**

Flexible exchange rates and the responses to changes in foreign macroeconomic policy

Suppose there is an expansionary fiscal policy in the foreign country that increases  $Y^*$  and  $i^*$  at the same time.

a. In an IS-LM–UIP diagram, show the effect of the increase in foreign output,  $Y^*$ , and the increase in the foreign interest rate,  $i^*$ , on domestic output ( $Y$ ) and the exchange rate ( $E$ ), when the domestic central bank leaves the policy interest rate unchanged. Explain in words.

b. In an IS-LM–UIP diagram, show the effect of the increase in foreign output,  $Y^*$ , and the increase in the foreign interest rate,  $i^*$ , on domestic output ( $Y$ ) and the exchange rate ( $E$ ), when the domestic central bank matches the increase in the foreign interest rate with an equal increase in the domestic interest rate. Explain in words.

c. In an IS-LM–UIP diagram, show the required domestic monetary policy following the increase in foreign output,  $Y^*$ , and the increase in the foreign interest rate,  $i^*$ , if the goal of domestic monetary policy is to leave domestic output ( $Y$ ) unchanged. Explain in words. When might such a policy be necessary?

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**3. Question 8 of Chapter 19 in the textbook. (7th edition, Demand for UK assets, the pounds, and the trade deficit).**

Demand for U.K. assets, the pound, and the trade deficit

This question explores how an increase in global demand for U.K. assets is likely to slow down the depreciation of the British pound. Here we modify the IS-LM-UIP framework (where UIP stands for uncovered interest rate parity) to analyze the effects of an increase in the demand for U.K. assets. Write the uncovered interest rate parity condition as:

$$(1 + i_t) = (1 + i_t^*)(E_t/E_{t+1}^e) - x$$

Where  $x$  represents factors affecting the relative demand for domestic assets. An increase in  $x$  means that investors are willing to hold domestic assets at a lower interest rate (given the foreign interest rate and the current and expected exchange rates).

a. Solve the UIP condition for the current exchange rate,  $E_t$ .

b. Substitute the result from part a in the IS curve and construct the UIP diagram. As in the text you may assume that  $P$  and  $P^*$  are constant and equal to one.

- c. The British pound has a higher interest rate in comparison to the euro. According to the UIP condition, explain whether the expected rate of the pound ( $E_{t+1}^e$ ) is supposed to appreciate or depreciate in the future. What are the effects on output and net exports? How is this reflected in the IS-LM-UIP diagram?
- d. Suppose that there are expectations that the expansionary monetary policy by the Bank of England will result in a permanent future increase in the money supply. If the prices of goods and services are fully flexible, do you expect the spot exchange rate to respond immediately?
- e. What is the effect of an increase in the demand for domestic assets  $x$ ? Do you expect that this increase will prevent the depreciation of the pound?

#### 4. Question 3 of Chapter 20 in the textbook. (7th edition, Policy Choices when the real exchange rate is “too high”)

Policy choices when the real exchange rate is “too high” and the nominal exchange rate is fixed

An overvalued real exchange rate is a rate such that domestic goods are too expensive relative to foreign goods, net exports are too small, and by implication the demand for domestic goods is too low. This leads to difficult policy choices for the government and central bank. The equations that describe the economy are:

$$Y = Y\left(\frac{\bar{E}P}{P^*}, G, T, i^* - \pi^e, Y^*\right)$$

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The IS curve:

The Phillips curves for the domestic and the foreign economy:

<i>Domestic Phillips curve</i>	$\pi - \bar{\pi} = (\alpha/L)(Y - Y_n)$
<i>Foreign Phillips curve</i>	$\pi^* - \bar{\pi}^* = (\alpha^*/L^*)(Y^* - Y_n^*)$

In the text and in this question, we are going to make two critical assumptions. These are explored in parts (a) and (b). Then we move to the analysis of the policy options when a country is experiencing an overvalued exchange rate.

- a. We are going to assume that the foreign economy is always in medium-run equilibrium. What are the implications of that assumption for foreign output and foreign inflation?
- b. We are going to assume that the domestic and foreign economies share the same anchored value for the level of expected inflation denoted  $\bar{\pi}$  and  $\bar{\pi}^*$ . What is the implication of that assumption once both the domestic and foreign economies are both in medium-run equilibrium?
- c. Draw the IS-LM-UIP diagram for the case where the domestic country has an overvalued nominal exchange rate. What is the key feature of that diagram? Under fixed exchange rates without a devaluation, how does the economy return to its medium-run equilibrium?
- d. Draw the IS-LM-UIP diagram for the case where the domestic country has an overvalued nominal exchange rate. Show how the economy can return to its to medium-run equilibrium when a devaluation is a policy choice.

e. Recall that the assumption has been made that interest rate parity holds so  $i = i^*$  at all times. Compare the returns on the domestic bond and the returns on the foreign bond in the period of the devaluation. Will bond holders continue to believe there is a completely fixed nominal exchange rate? If bond holders believe another devaluation is possible, what are the consequences for domestic interest rates?

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**5. Question 7 of Chapter 20 in the textbook. (7th edition, Real and nominal exchange rates for Russia and China).**

Real and nominal exchange rates for Russia and China

Russia and China are two of the largest trading partners and exporters to the European Union. The database of the European Central Bank provides direct quotations of foreign currencies against the euro, which they refer to as the “Euro foreign exchange reference rates”.

Download the exchange rates for each of the Russian ruble (RUB) per euro and the Chinese yuans per euro for the last 10 years.

a. The exchange rate is defined as the number of Russian rubles per one euro and the number of Chinese yuans per one euro. Redefine the exchange rates as the number of euro cents per rubles and the number of euro cents per yuan. Who does this direct quote of exchange rates benefit?

b. Download and prepare charts depicting exchange rates of the euro against each of the ruble and yuan. Compare and contrast the behavior of each of the ruble and the yuan against the euro. Do you see a period when either of the ruble or lira is pegged? Do you observe a general trend of appreciation or depreciation of the euro against the two currencies? Which country/countries benefit from the changes in the exchange rate?

c. Why do countries resort to devaluing their domestic currencies? When does a depreciated currency lead to inflation? How do inflation measures help to differentiate between nominal exchange rates and real exchange rates? Check the inflation rate of Russia and the EU for last year. Do you expect the real exchange rate between the ruble and the euro to be higher or lower than the nominal exchange rate? Explain your answer.

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6. For your practice only. You do not need to hand it in. The following question is from final exam of 2009. Use that as an example for the essay question in the final exam. Read the article and answer the following question.

### **Burger-thy-neighbour policies**

Feb 5th 2009

From The Economist print edition

Attacks on China's cheap currency are overdone

CHINA has been accused of "manipulating" its currency by Tim Geithner, America's new treasury secretary, and this week Dominique Strauss-Kahn, the managing director of the IMF, said that it was "common knowledge" that the yuan was undervalued. You would assume that such strong claims were backed by solid proof, but the evidence is, in fact, mixed.

Of course China manipulates its exchange rate—in the sense that the level of the yuan is not set by the market, but influenced by foreign-exchange intervention. The real issue is whether Beijing is deliberately keeping the yuan cheap to give exporters an unfair advantage. From July 2005, when it abandoned its fixed peg to the dollar, Beijing allowed the yuan to rise steadily, but since last July it has again been virtually pegged to the greenback. But American politicians are wrong to focus only on the yuan's dollar exchange rate. Since July the yuan has gained 10% in trade-weighted terms. It is up 23% against the euro, and 30% or more against the currencies of many other emerging economies.

Those who argue that the yuan is still too cheap point to three factors: China's foreign-exchange reserves have surged; it has a huge current-account surplus; and prices are much cheaper in China than in America. Start with official reserves. If China had not bought lots of dollars over the past few years, the yuan's exchange rate would have risen by more. So does the yuan's fixed level against the dollar in recent months mean that intervention has risen? On the contrary, in the fourth quarter of 2008, China's reserves barely rose, despite a record current-account surplus. This suggests that private capital is now flowing out of China.

Charles Dumas, an economist at Lombard Street Research, argues that outflows of hot money could become a flood if China did not have capital controls. China also has strict capital controls which, although leaky, keep private savings at home. If Beijing scrapped those controls, firms and households would want to invest abroad to diversify their assets. In other words, if the value of the yuan was not "manipulated" and instead was set entirely by the free market, it might fall, not rise.

Some argue that China's large current-account surplus is incontrovertible proof that the yuan is too cheap. Morris Goldstein and Nicholas Lardy estimate that the yuan's real trade-weighted value needs to rise by another 10-20% to eliminate the surplus. But other economists say it is wrong to define the yuan's fair value by the revaluation required to eliminate the current-account surplus. Trade does not have to be perfectly balanced to be fair. And China's surplus partly reflects its high saving rate. To reduce China's external gap, policies to boost domestic spending will be more important than its exchange rate.

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a) For an economy with fixed exchange rate regime, write down the good market clearing condition, the money market clearing condition and the UIRP condition. Assume that that  $\pi^e = 0$ , use IS-LM diagram in the open economy to show the effects of an increase in domestic spending on output, consumption, investment, exchange rate, and net export. Explain the intuition. (6 marks)

b) Many people think that China's large current-account surplus is incontrovertible proof that the yuan is too cheap. However, the author argues that boosting China's domestic spending is also important. Use your answer in a) to explain why this is the case. Then explain why an appreciation (revaluation of the RMB) might not help to eliminate the imbalance of trade between the US and China. Finally, the author mentioned that China's big trade surplus partly reflects its high saving rate, explain why this is the case. (7 marks)

c) We know from the article that China follows a fixed exchange rate regime and rigorous capital control. Can the Chinese government have monetary policy autonomy? Explain your answer. Then analyze why the value of Yuan might fall instead of rise if China does not impose rigorous capital control. (5 marks)

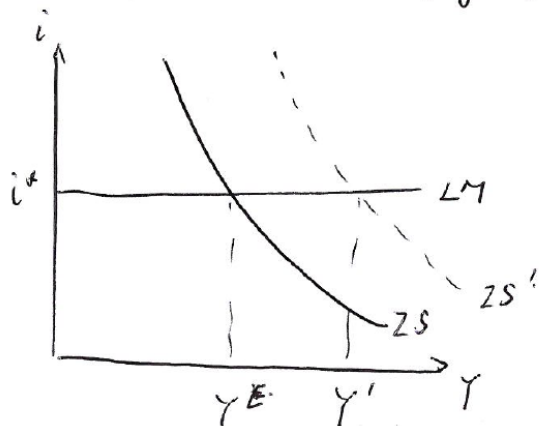
(2(a))

$$ZS: Y_t = C(Y_t - T_t) + Z(Y_t, i^* - \pi_t^e) + G_t + NX(Y_t, Y^*, \epsilon_t)$$

where  $\epsilon_t = \frac{\bar{E}P}{P^*}$   $\bar{E}$  is the fixed ER

From ULRP, if  $\epsilon_t = \epsilon_{t+1} = \bar{\epsilon}$ , we must have  $i = i^*$ .  
so we simply ~~write~~  $Z(Y_t, i_t - \pi_t^e)$  as  $Z(Y_t, i^* - \pi_t^e)$

LM curve is simply given by  $i = i^*$ .



If domestic spending increase, then we should have the ZS curve shift right

But since ULRP implies that  $i$  should always equals to  $i^*$ , LM curve will not shift.

In the new  $\bar{E}_f^m$ , we have  $Y' > Y^E$  increase.

$Z(Y, i^* - \pi^e)$  will increase since  $Y \uparrow$  &  $i^* - \pi^e$  doesn't change.

$E = \bar{E}$  no change since  $i = i^*$  all the time

$C(Y - T)$  will also increase.

$NX(Y, Y^*, \frac{\bar{E}P}{P^*})$  in the SR, since  $P \& P^*$  is fixed,  $\epsilon$  is also fixed.

so we must have that  $NX \downarrow$

Part b. i; According to a),  $\uparrow$  in domestic spending will lead to decreases in NX (net export). So this will help to reduce the trade imbalance.

ii; According to b), we know that although revaluation will lead to lead to  $\downarrow$  of NX in the SR, in the MR, the adjustment of price level will lead the Real ER back to the level before the adjustment.

$$Y_n = C(Y_n - T) + G + I(Y_n, i^* - \pi^e) + NX(Y_n, Y^*, \epsilon_n)$$

Before adjustment,  $\epsilon_n = \frac{\bar{E}_0 P_0}{P^*}$ , in short run.

$E_0 \rightarrow E_1, \epsilon_1$ ; In the medium run,  $\epsilon_1$  will go back to  $\epsilon_n = \frac{\bar{E}_1 P_1}{P^*}$ , since other real variables remain unchanged.

Also, even in the SR,  $\uparrow$  of  $E$  will <sup>(real appreciation)</sup> not lead to  $\uparrow$  of net export immediately, just like what we describe in the J curve.  $NX = X(Y^*, \epsilon) - \frac{IM(Y, \epsilon)}{\epsilon}$ , if the export and import do not change immediately to changes in  $\epsilon$ , then NX will fall first, then increase.

So an appreciation might not help to eliminate the imbalance of trade between US and China

$$iii) \quad NX = Y - C - G - I \quad S = Y - C - T$$

$$\Rightarrow S = C + I + G - C - T + NX$$

$$= I + G - T + NX$$

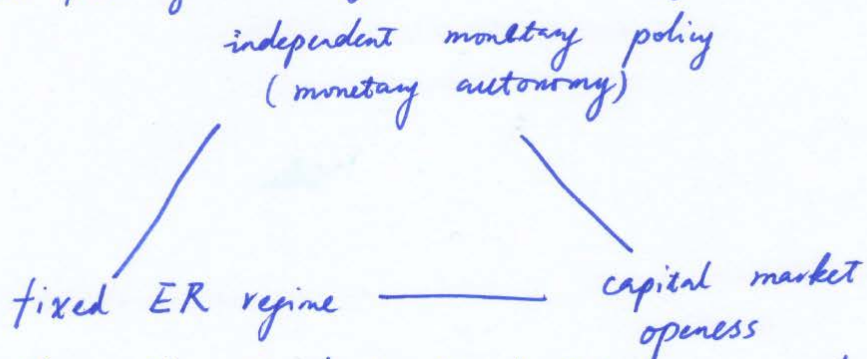
$$\Rightarrow NX = \underbrace{S + (T - G)}_{\substack{\text{private saving +} \\ \text{public saving}}} - I \rightarrow \text{investment}$$

Trade surplus - an excess of domestic saving over investment.

So . . . .



Part c. According to the policy trilemma, a country cannot achieve the following three goals simultaneously.



For China, since it adopts fixed ER regime, also has vigorous capital control, it can have independent monetary policy. This is because even if  $i \neq i^*$ , but  $E$  is fixed, vigorous capital control prevent huge inflow or outflow of funds. But if there is no capital control, like in the case of HK,  $i$  has to equal to  $i^*$  to keep fixed exchange rate.  $\rightarrow$  This is an open question, possible answer are:

In China, ~~at~~ many people may want to diversify their portfolio by holding foreign currency denominated assets, so it is possible that there is a lot of demand for foreign currency (like US\$) and supply of Yuan, which implies the RMB may devalue if there is no vigorous capital control.

Another possible reason is the inflow and outflow of hot money. Many investors may expect that the revaluation of RMB implies that in the future no more room for further revaluation (at least in SR), so they will sell RMB ~~and~~ assets. This may lead to huge capital outflow and devaluation of RMB, w/o vigorous capital control.

Open Q, so see if their answer makes sense.