

## Week 21 - Question 2.2

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**The questions asks us to consider the effect of speculations about currency revaluation, triggered by an increase in domestic demand, on output - under a fixed exchange rate regime - for two different scenarios: The nominal interest rate remains constant (i.e. the CB does not defend its nominal exchange rate target), or the nominal exchange rate remains constant (i.e. the CB defends its nominal exchange rate target).**

Initially, the economy's level of production is at the natural level. The increase in aggregate demand shifts the IS curve to the right, i.e. at the same nominal interest rate, aggregate demand is higher. First, how does this trigger speculations to revalue the currency? The solution to this question implies that people might expect that the CB cares enough about output stabilization to take action to close the output gap. As output before was at the natural level, and increases with the rise in aggregate demand above the natural level, the CB would be expected to raise the interest rate to close the positive output gap.

Second, in what direction do speculators expect the price of the currency to change? If speculators expect that the CB will raise the interest rate in the future, they expect the nominal exchange rate to appreciate. This can be seen from the interest parity condition:

$$e \uparrow = \frac{1 + i \uparrow}{1 + i^*} e^e$$

One way to interpret this condition in this situation is as follows: For given expectations and foreign nominal interest rates, if the CB raises the interest rate, the nominal exchange rate would have to increase. This is because the higher nominal interest rate would make investing in the domestic economy relatively more attractive, thus increasing the demand for the domestic currency. Because the CB has not yet raised the interest rate, but is expected by speculators to do so at some point in the near future, from the perspective of a speculator today, the *expected* nominal exchange rate increases.

Now we want to examine two scenarios: First, we keep the nominal interest rate constant and let the nominal exchange rate adjust, and second, we keep

the nominal exchange rate constant and let the nominal interest rate adjust.<sup>1</sup> Below, I only reiterate the solution to the first scenario, because there is a second shift in the IS curve which was not mentioned in the seminars early that week.

Turning to the first scenario then, note that the IS curve first shifts right (to IS'), because of the increase in aggregate demand of course. Then, because of the speculations about a revaluation of the currency, the IP curve shifts left (to IP'), i.e. for a given nominal interest rate, the nominal exchange rate is higher. Why does the IP curve shift left? Note that the IP curve is just a graphical depiction of the interest parity condition. We can see again from the interest parity condition that an increase in the expected nominal exchange rate, for given nominal interest rates, increases the current nominal exchange rate:<sup>2</sup>

$$e \uparrow = \frac{1+i}{1+i^*} e^e \uparrow$$

Now, there is a second shift in the IS curve (to IS''), which I did not mention in all seminars: Because we draw the IS curve as a function of the nominal interest rate, any change in the real exchange rate shifts the IS curve. In the short-run, prices are fixed, so any change in the nominal exchange rate is a change in the real exchange rate. From the fact that the IP curve shifts left, we can see that the IS curve has to shift left again, reflecting that for a higher real exchange rate aggregate demand is lower. We have not formally shown how large this inward shift will be, but it results from lower NX, and NX would have to be very sensitive to changes in the real exchange rate to completely offset the initial increase in aggregate demand (it would imply that an increase in domestic demand decreases aggregate demand overall), so I draw the final IS curve to the right of the initial one.

Finally, we end up in a situation where the nominal exchange rate has increased to  $e_2$ , expectations have increased, the nominal exchange rate stays the same at  $i^*$ , and output is above the natural level at  $Y_2$ . Results are shown graphically in figure 1.

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<sup>1</sup>Obviously, the speculators' expectations about an increase in the nominal interest rate may turn out to be wrong, so its not inconsistent to look at the case when the nominal interest rate does not adjust. The important point is that their expectations about something that might happen have an impact on the present situation, independently of those expectations realizing or not.

<sup>2</sup>Note that we are looking at the interest parity condition now from today's perspective, whereas the interest parity condition we looked at before referred to a future and hypothetical state when the CB would raise the nominal interest rate.

Figure 1: Question 2.2 - Constant nominal interest rate

