EC1B5 | Chapter 15

Open Economy Macroeconomics

Additional Practice Questions:

Book Question 1

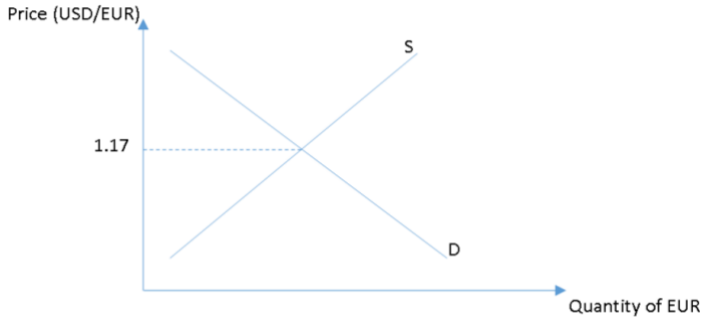
Suppose that the European Union follows a flexible exchange rate regime. The exchange rate between the euro (EUR) and the U.S. dollar (USD) is currently 1 EUR = 1.17 USD.

a. Use a graph to show the equilibrium in the foreign exchange market with the U.S.-dollar-per-euro exchange rate on the *y*-axis and the quantity of euros on the *x*-axis.

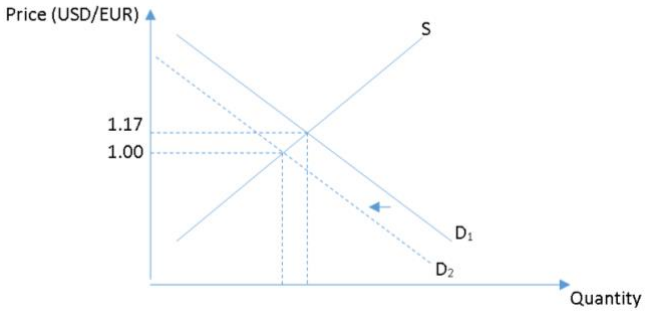
b. Suppose that due to challenges in the eurozone economic environment, the cost of producing goods in the Eurozone increases sharply. What effect will this have on the exchange rate? Use a graph to explain.

Answer:

a. The following graph shows the foreign exchange market in the Eurozone. The supply curve for EURs in exchange for USDs is shown as an upward-sloping curve. The demand curve for EURs in exchange for USDs is shown as a downward-sloping curve. The y-axis shows how many USDs can be exchanged per EURs, while the *x*-axis shows the quantity of EURs traded in the foreign exchange market. As the Eurozone follows a flexible exchange rate regime, the market is in equilibrium at the point where the supply and demand curves intersect at an exchange rate of 1 EUR = 1.17 USD.



b. As the Eurozone production has become less competitive, the prices have increased. As a result of the price increase, there will be less demand for products from the Eurozone, and the demand curve will therefore shift to the left. As opposed to 1 EUR = 1.17 USD, the EUR will depreciate, for example, to a level of 1 EUR = 1 USD.

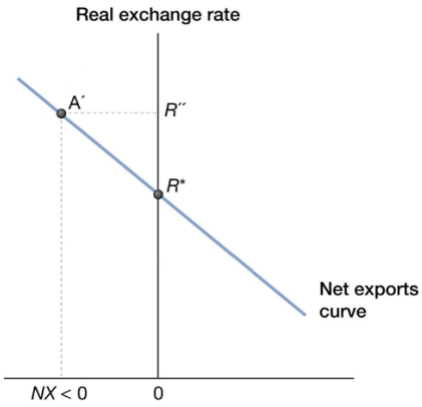


Book Question 4

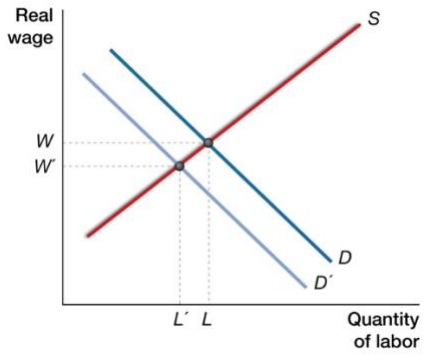
Using the net exports curve and the labor demand and labor supply curve, explain how a rise in the real exchange rate can lead to a decrease in employment in a country.

Answer:

The net exports curve shows the relationship between the real exchange rate and net exports. When the real exchange rate between, say, the EUR and the USD, rises to *R''*, Europe will export less to the U.S. as European goods are now more expensive to Americans and import more because American goods are now cheaper to Europeans. 'Net exports' is defined as the difference between a country's exports and imports. As exports decrease and imports increase, the value of European net exports will also decrease. The economy moves to point A′ in the following graph, which happens to show negative net exports.



As the foreign demand for European goods and services decreases, producers in European countries will decrease employment in the face of lower demand for their products. The demand for labor curve will shift to the left from *D* to *D'*. Assuming that wages are flexible, the real wage and level of employment in Europe will decrease to *W'* and *L'*, respectively.



Book Question 5

Econia trades with its neighbors, the countries of Governmentia and Sociologia. In Econia, the currency is called the econ; in Governmentia, the currency is called the gov; and in Sociologia, the currency is the soc.

Nominal exchange rates follow:

200 econ = 1 gov,

4 socs = 1 gov,

100 econ = 1 soc

A good that is produced and consumed in all three countries is the Mack Burger. The price of Macks in the three countries is as follows: one Mack costs 2 govs in Governmentia, 16 socs in Sociologia, and 600 econs in Econia.

a. From the perspective of Governmentia, calculate the real exchange rate in Mack between Governmentia and Sociologia, using the nominal exchange rate (4 socs per gov) and prices listed above. Explain in words what the number you calculated means.

b. If these three currencies can be freely traded so that their exchange rates are flexible or floating, can the nominal exchange rates listed above persist over time? Why or why not? (Hint: Show that currency traders could make unlimited profits if they could persistently trade at these exchange rates.)

Answer:

a. The equation for the real exchange rate (denoted by *E*) is as follows:

$$E = \frac{(\text{Domestic price}) \times e}{(\text{Foreign price})}$$

Where

Domestic price = the domestic price of the Mack Burger

e = Nominal Exchange Rate, expressed in units of foreign currency per unit of domestic currency

Foreign price = the foreign price of the Mack Burger

Governmentia is the domestic country, and Sociologia is the foreign country, as stated in the question. We know that the P_{Dom} is equal to 2 govs and that the P_{For} is equal to 16 socs. The nominal exchange rate is 4 socs/gov. Substituting these values into the real exchange rate equation yields:

$$R = (2 \times 4) / 16 = ½$$

We find the real exchange rate is equal to ½, which is the price of goods in Governmentia in terms of the price of goods in Sociologia. In other words, the real exchange rate is the relative price of goods in the two countries, or it is the rate at which we can trade goods in Governmentia for goods in Sociologia: A Governmentia Mack costs ½ of a Sociologia Mack.

b. No, in a freely traded market currency traders have an opportunity to conduct arbitrage trades. (Arbitrage means that a trader can lock in a price differential for the same asset and make a profit without taking any risk.) The exchange rates as given allow for arbitrageurs to make money. For instance, starting with 1 gov, you could first trade the 1 gov for socs in the currency markets and receive 4 socs. Next, you could trade the 4 socs in the currency markets for 400 econs. Lastly, you could trade the 400 econs in the currency markets for 2 govs. There is an arbitrage opportunity to make a 1 gov profit by trading govs into socs into econs and then back into govs.

For floating currencies, arbitrageurs will capitalize on the market inefficiencies and drive all nominal exchange rates to a consistent level; thus, the exchange rates as listed cannot persist over time. If they did, traders could continue the arbitrage trading given previously, turning 2 govs into 4, then 4 into 8, repeating the trade an infinite number of times and make unlimited profits. They would have discovered a money machine!

Book Question 8

Since 2008, the dollar has generally appreciated against the euro.

a. Suppose that in the short run the Fed wanted both to weaken the dollar (that is, stop its appreciation and/or cause it to depreciate) and stimulate investment. Based on what you have learned in this chapter and in Chapter 13, discuss whether the Fed can achieve both of these goals simultaneously through monetary policy.

b. Suppose instead that the European Central Bank conducts contractionary monetary policy. What is the short-run effect, if any, of this policy on the euro-per-dollar nominal exchange rate and on the real exchange rate between the United States and the eurozone? In your answer regarding the real exchange rate, state any assumptions you are making.

Answer:

a. We are told that the dollar has depreciated relative to the euro. Facing this situation, the Federal Reserve wants both to weaken the dollar and to stimulate investment.

   To weaken the dollar, the Fed must conduct expansionary monetary policy—e.g., buy bonds in an open-market operation, which would increase reserves in the banking system and thereby increase the money supply. The supply of reserves would shift to the right, resulting in a lower equilibrium fed funds rate, and lower interest rates in general, in the United States.

   Holding everything else constant, a] decrease in the U.S. real interest rate makes investment in U.S. financial markets a less attractive opportunity than investment Europe, and thus leads to capital flowing out of the United States and into Europe. As investors abandon dollar-denominated assets for those denominated in the euro, they sell dollars and buy euros, thus causing the dollar to depreciate (and the euro to appreciate).

   In addition, the decrease in interest rates necessary to defend the dollar is consistent with the Fed's second goal of stimulating investment. Investment is, among other things, negatively related to the real interest rate.

   Therefore, the Fed can achieve both goals simultaneously through expansionary monetary policy.

b. Contractionary monetary policy carried out by the European Central Bank (ECB) will raise interest rates in those European countries over which the ECB has jurisdiction—that is, the countries that belong to the European Monetary Union (EMU). These are the countries that use the euro.

   An increase in EMU interest rates will lead to capital flowing into EMU countries from the United States. Because euro-denominated assets will become more attractive relative to dollar-denominated assets, investors will demand more euro-denominated assets, and hence demand more euros to buy those assets. This will cause an appreciation of the euro, and a depreciation of the dollar. The euro/dollar nominal exchange rate will decrease—it will take fewer euros to buy one dollar.

   From the standpoint of the United States, the real exchange rate is equal to $\frac{\text{U.S. price level} \times e}{\text{EMU price level}}$, where e is equal to the nominal exchange rate (the number of euros per dollar). A decrease in e will lead to a decrease in the real exchange rate, assuming no increase in relative prices in the United States and European Monetary Union, i.e., assuming that $\frac{\text{U.S. price level}}{\text{EMU price level}}$ does not increase, or if it does increase, it does not do so enough to offset the decrease in e.

Book Question 9

Thailand and Taiwan are both rapidly growing Asian economies that trade actively with other countries.

a. Suppose a computer circuit board is the only good produced in Thailand and Taiwan. The circuit board costs 100 baht in Thailand and 200 NT (New Taiwan dollars) in Taiwan. The nominal exchange rate is 2 NT per baht.. Calculate the real exchange rate from Thailand's perspective (that is, using Thailand as the domestic economy, so the nominal exchange rate is 2 NT per baht). Show your work. Intuitively, what does this number represent?

b. The Taiwanese current account with the rest of the world is initially balanced –in other words, it is running neither a deficit nor a surplus. Taiwan alone experiences an economic boom and its real interest rate rises at the same time. Explain the mechanisms by which the Taiwanese current account is affected by its boom and the increase in its real interest rate.

c. Assume that the change in the value of the NT-per-baht exchange rate was 50 percent, which, depending on your answer in part (b), was either appreciation or depreciation. What is the current nominal exchange rate expressed in NT per baht? Show your work.

Answer:

a. The real exchange rate is 1 Taiwanese computer circuit board per Thai computer circuit board.

The real exchange rate formula is $E = \frac{(\text{Domestic price}) \times e}{(\text{Foreign price})}$ where e is the nominal exchange rate and E is the real exchange rate. The nominal exchange rate from the Thai perspective is 2 NT per bhat. Therefore, E = [(100 bhat) × (2 NT per bhat)] / 200 NT = 1. This represents the number of Taiwanese computer circuit boards it takes to buy one Thai computer circuit board.

b. Both the economic boom and the rise in the real interest rate cause a current account deficit in Taiwan. The economic boom raises domestic income or output, which increases imports because domestic income is one of the determinants of import demand. Since $NX = X - IM$, an increase in imports decreases net exports, which leads to a current account deficit (or negative current account). The rising Taiwanese interest rates increase the attractiveness of Taiwanese or NT-denominated assets compared to foreign assets. The NT appreciates relative to other currencies, causing a rise in the nominal exchange rate. Therefore, the real exchange rate also rises according to the exchange rate formula. An increase in the real exchange rate makes Taiwanese exports relatively more expensive to foreigners and makes foreign imports relatively less expensive to the Taiwanese. This decreases exports and increases imports, which decreases net exports. Thus, the rise in interest rates also contributes to a Taiwanese current account deficit.

c. From (b) we know that the NT appreciates. In part (a) you could exchange 2 NT for 1 baht. After the 50 percent appreciation of the NT, the value of the nominal exchange rate is 4/3 bhat per NT (e = 4/3 NT per baht). You can now exchange 4/3 NT for one baht.