

## 5.6: Exchange Rate Effects of Changes in Foreign Interest Rates Using the RoR Diagram

### Learning Objective

1. Learn the effects of changes in the foreign interest rate on the value of the domestic and foreign currency using the interest rate parity model.

Suppose that the foreign exchange market (Forex) is initially in equilibrium such that  $R_0 R_\$ = R_0 R_\pounds$  (i.e., interest rate parity holds) at an initial equilibrium exchange rate given by  $E'_{\$/\pounds}$ . The initial equilibrium is depicted in Figure 5.8. Next, suppose British interest rates rise, ceteris paribus. Ceteris paribus means we assume all other exogenous variables remain fixed at their original values. In this model, the U.S. interest rate ( $i_\$$ ) and the expected exchange rate ( $E^e_{\$/\pounds}$ ) both remain fixed as British interest rates rise.

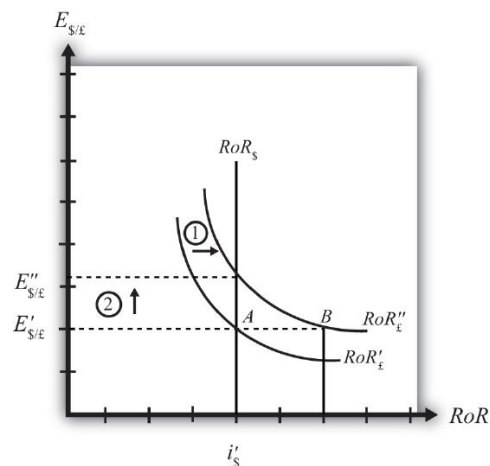


Figure 5.6.1: Effects of a British Interest Rate Increase in a RoR Diagram

The increase in British interest rates ( $i_\pounds$ ) will shift the British RoR line to the right from  $R_0 R'_\pounds$  to  $R_0 R''_\pounds$  as indicated by step 1 in the figure.

The reason for the shift can be seen by looking at the simple rate of return formula:

Suppose one is at the original equilibrium with exchange rate  $E'_{\$/\pounds}$ . Looking at the formula, an increase in  $i_\pounds$  clearly raises the value of  $R_0 R_\pounds$  for any fixed values of  $E^e_{\$/\pounds}$ . This could be represented as a shift to the right on the diagram, as from A to B. Once at B with a new interest rate, one could perform the exercise used to plot out the downward sloping RoR curve (see Chapter 5, [Section 5.3](#)). The result would be a curve, like the original, but shifted entirely to the right.

Immediately after the increase and before the exchange rate changes,  $R_0 R_\pounds > R_0 R_\$$ . The adjustment to the new equilibrium will follow the “exchange rate too low” equilibrium story presented in Chapter 5, [Section 5.4](#). Accordingly, higher British interest rates will make British pound investments more attractive to investors, leading to an increase in demand for pounds on the Forex, and resulting in an appreciation of the pound, a depreciation of the dollar, and an increase in  $E_{\$/\pounds}$ . The exchange rate will rise to the new equilibrium rate  $E''_{\$/\pounds}$  as indicated by step 2.

In summary, an increase in British interest rates will raise the rate of return on pounds above the rate of return on dollars, lead investors to shift investments to British assets, and result in an increase in the  $\$/\pounds$  exchange rate (i.e., an appreciation of the British pound and a depreciation of the U.S. dollar).

In contrast, a decrease in British interest rates will lower the rate of return on British pounds below the rate of return on dollars, lead investors to shift investments to U.S. assets, and result in a decrease in the  $\$/\pounds$  exchange rate (i.e., a depreciation of the British pound and an appreciation of the U.S. dollar).

### Key Takeaways

- An increase in British interest rates will result in an increase in the \$/£ exchange rate (i.e., an appreciation of the British pound and a depreciation of the U.S. dollar).
- A decrease in British interest rates will result in a decrease in the \$/£ exchange rate (i.e., a depreciation of the British pound and an appreciation of the U.S. dollar).

### exercise

1. Consider the economic change listed along the top row of the following table. In the empty boxes, indicate the effect of each change, sequentially, on the variables listed in the first column. For example, a decrease in U.S. interest rates will cause a decrease in the rate of return (RoR) on U.S. assets. Therefore a “–” is placed in the first box of the table. Next in sequence, answer how the RoR on euro assets will be affected. Use the interest rate parity model to determine the answers. You do not need to show your work. Use the following notation:

+ the variable increases

– the variable decreases

0 the variable does not change

A the variable change is ambiguous (i.e., it may rise, it may fall)

	A Decrease in Euro Interest Rates
RoR on U.S. Assets	–
RoR on Euro Assets	
Demand for U.S. Dollars on the Forex	
Demand for Euros on the Forex	
U.S. Dollar Value	
Euro Value	
$E_{\$/\epsilon}$	

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