

# Chapter 17

## The Foreign Exchange Market



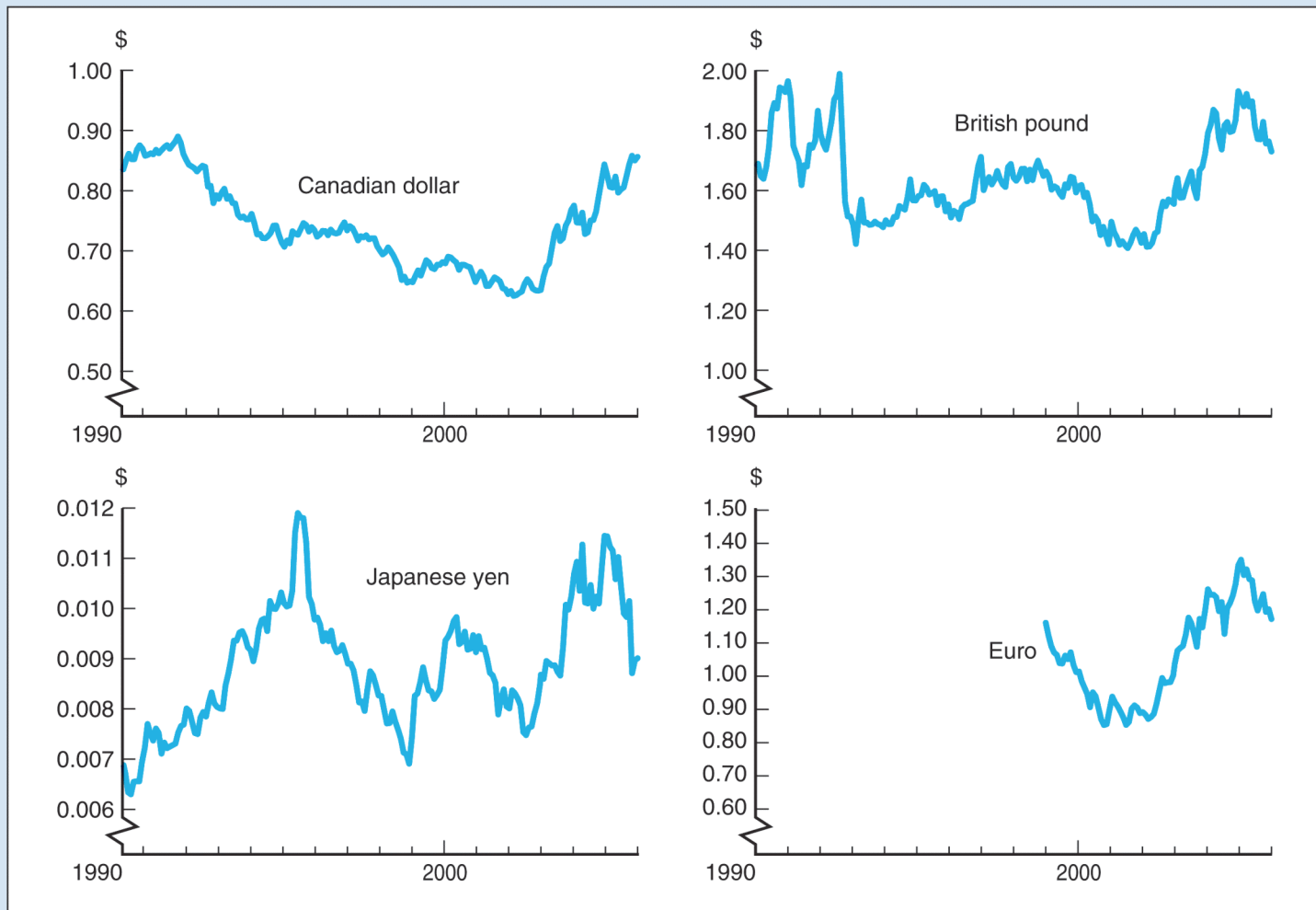
# Foreign Exchange I

- Exchange rate—price of one currency in terms of another
- Foreign exchange market—the financial market where exchange rates are determined
- Spot transaction—immediate (two-day) exchange of bank deposits
  - ◆ Spot exchange rate
- Forward transaction—the exchange of bank deposits at some specified future date
  - ◆ Forward exchange rate



# Foreign Exchange II

- Appreciation—a currency rises in value relative to another currency
- Depreciation—a currency falls in value relative to another currency
- When a country's currency appreciates, the country's goods abroad become more expensive and foreign goods in that country become less expensive and vice versa
- Over-the-counter market mainly banks



**FIGURE 1 Exchange Rates, 1990–2005**

Dollar prices of selected currencies. Note that a rise in these plots indicates a strengthening of the currency (weakening of the dollar).

Source: Federal Reserve: [www.federalreserve.gov/releases/h10/hist](http://www.federalreserve.gov/releases/h10/hist).



# Exchange Rates in the Long Run

- Law of one price
- Theory of Purchasing Power Parity
  - ◆ Assumes all goods are identical in both countries
  - ◆ Trade barriers and transportation costs are low
  - ◆ Many goods and services are not traded across borders



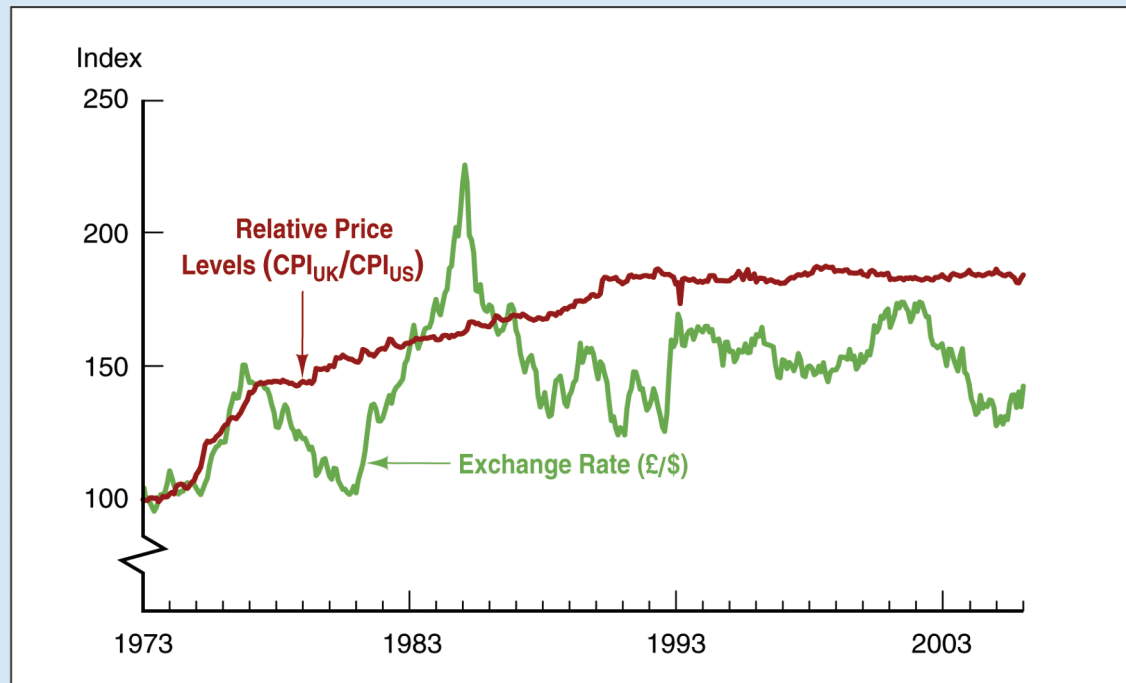
# Factors that Affect Exchange Rates in the Long Run

- Relative price levels
- Trade barriers
- Preferences for domestic versus foreign goods
- Productivity



**FIGURE 2**  
**Purchasing Power Parity,**  
**United States/United**  
**Kingdom, 1973–2005**  
**(Index: March 1973 = 100.)**

Source: [www.statistics.gov.uk/statbase/tsdataset2.asp](http://www.statistics.gov.uk/statbase/tsdataset2.asp).





## SUMMARY

**TABLE 1 Factors That Affect Exchange Rates in the Long Run**

Factor	Change in Factor	Response of the Exchange Rate, $E^*$
Domestic price level <sup>†</sup>	↑	↓
Trade barriers <sup>†</sup>	↑	↑
Import demand	↑	↓
Export demand	↑	↑
Productivity <sup>†</sup>	↑	↑

\*Units of foreign currency per dollar: ↑ indicates domestic currency appreciation; ↓, depreciation.

<sup>†</sup>Relative to other countries.

*Note:* Only increases (↑) in the factors are shown; the effects of decreases in the variables on the exchange rate are the opposite of those indicated in the “Response” column.



A vertical stack of several coins, likely Euro coins, is shown on the left side of the slide. The coins are stacked on top of each other, with the top coin being the most prominent. The background behind the coins is a light blue gradient.

# Exchange Rates in the Short Run

- An exchange rate is the price of domestic assets in terms of foreign assets
- Using the theory of asset demand—the most important factor affecting the demand for domestic (dollar) assets and foreign (euro) assets is the expected return on these assets relative to each other



# Comparing Expected Returns I

Dollar assets pay an interest rate of  $i^D$  and do not have any capital gain

Foreign assets have an interest rate of  $i^F$  and there is no capital gain

To compare the expected returns on dollar assets and foreign assets  
the returns must be converted into the currency unit used

$E_t$  = the spot exchange rate

$E_{t+1}$  = the exchange rate for the next period

$\frac{E_{t+1}^e - E_t}{E_t}$  = the expected rate of appreciation for the dollar



# Comparing Expected Returns II

The expected return on dollar assets  $R^D$  in terms of foreign currency is the sum of the interest rate on dollar assets plus the expected appreciation of the dollar

$$R^D \text{ in term of euros} = i^D + \frac{E_{t+1}^e - E_t}{E_t}$$

The expected return on foreign assets  $R^F$  is  $i^F$

$$\text{Relative } R^D = i^D - i^F + \frac{E_{t+1}^e - E_t}{E_t}$$

As the relative expected return on dollar assets increases, foreigners will want to hold more dollar assets



# Comparing Expected Returns III

The expected return on foreign assets  $R^F$  in terms of dollars is the interest rate on foreign assets  $i^F$  plus the expected appreciation of the foreign currency, equal to minus the expected appreciation of the dollar

$$R^F \text{ in terms of dollars} = i^F - \frac{E_{t+1}^e - E_t}{E_t}$$

The expected return on the dollar assets  $R^D$  is  $i^D$

$$\text{Relative } R^D = i^D - \left( i^F - \frac{E_{t+1}^e - E_t}{E_t} \right) = i^D - i^F + \frac{E_{t+1}^e - E_t}{E_t}$$

Which is the same as previously

Relative expected return on dollar assets is the same whether it is calculated in terms of euros or in terms of dollars

As the relative expected return on dollar assets increases, both foreigners and domestic residents will want to hold more dollar assets



# Interest Parity Condition

$$i^D = i^F - \frac{E_{t+1}^e - E_t}{E_t}$$

- Capital mobility with similar risk and liquidity  $\Rightarrow$  the assets are perfect substitutes
- The domestic interest rate equals the foreign interest rate minus the expected appreciation of the domestic currency
- Expected returns are the same on both domestic and foreign assets
- An equilibrium condition



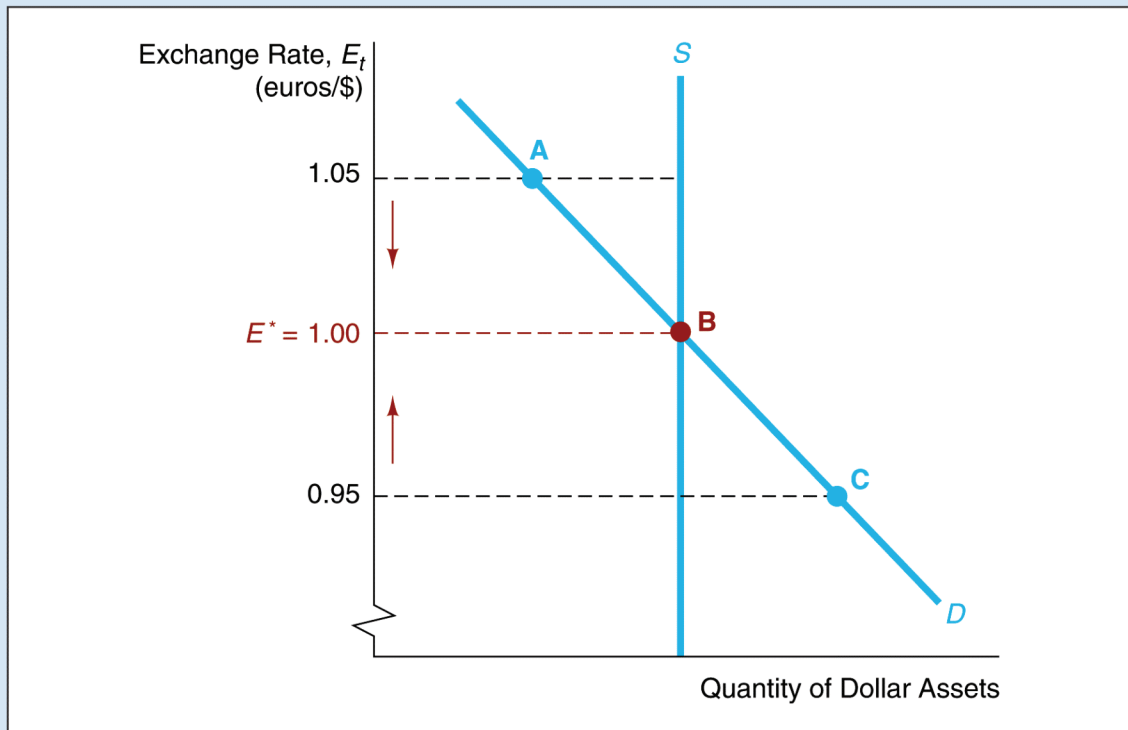
# Demand and Supply for Domestic Assets

- Demand
  - ◆ Relative expected return
  - ◆ At lower current values of the dollar (everything else equal), the quantity demanded of dollar assets is higher
- Supply
  - ◆ The amount of bank deposits, bonds, and equities in the U.S.
  - ◆ Vertical supply curve



**FIGURE 3**  
**Equilibrium in the Foreign Exchange Market**

Equilibrium in the foreign exchange market occurs at point B, the intersection of the demand curve *D* and the supply curve *S*. The equilibrium exchange rate is  $E^* = 1$  euro per dollar.

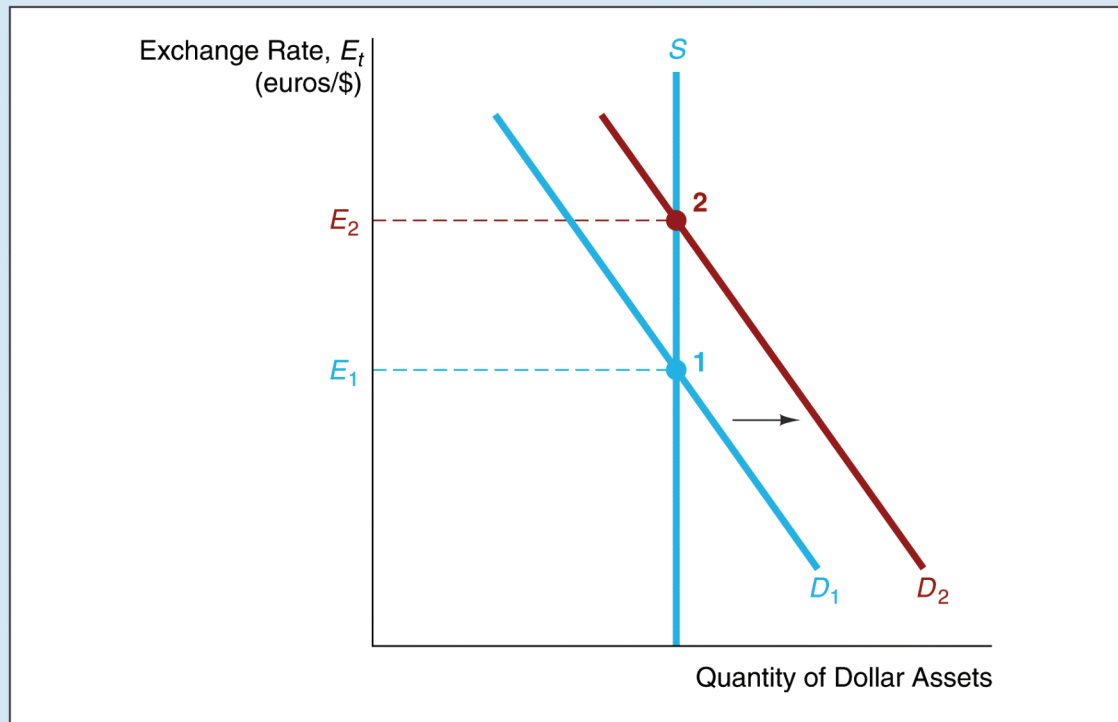




### FIGURE 4

#### Response to an Increase in the Domestic Interest Rate, $i^D$

When the domestic interest rate  $i^D$  increases, the relative expected return on domestic (dollar) assets increases and the demand curve shifts to the right. The equilibrium exchange rate rises from  $E_1$  to  $E_2$ .



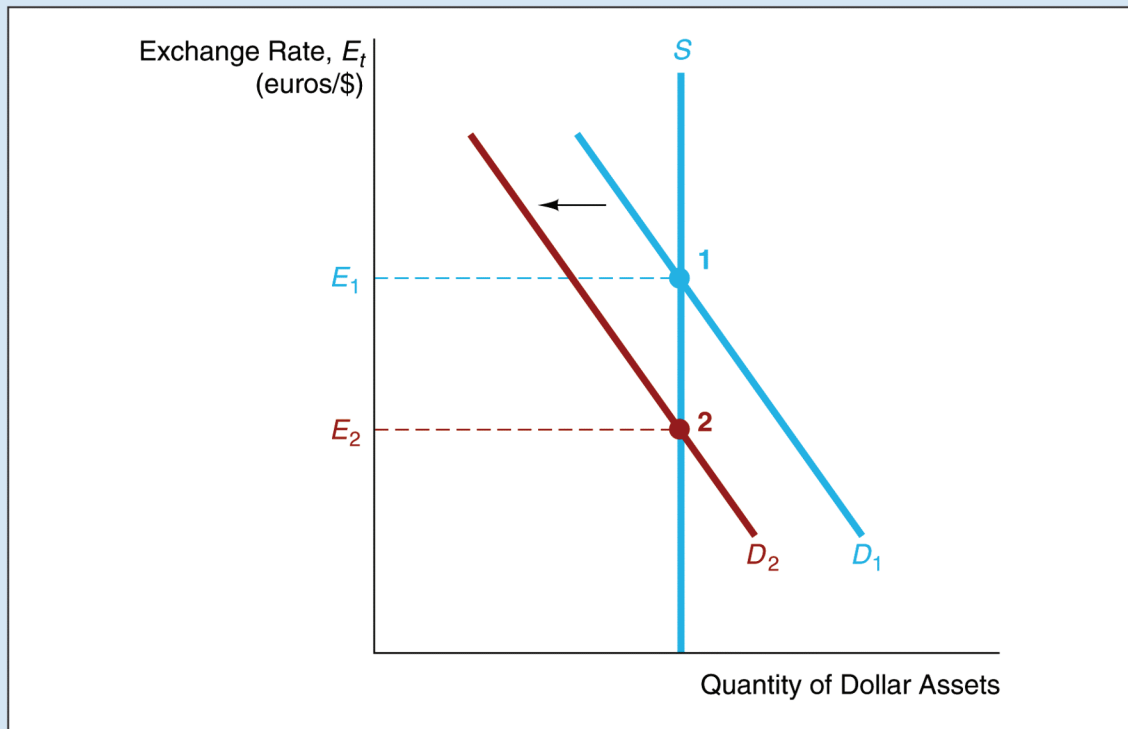




### FIGURE 5

#### Response to an Increase in the Foreign Interest Rate, $i^F$

When the foreign interest rate  $i^F$  increases, the relative expected return on domestic (dollar) assets falls and the demand curve shifts to the left. The equilibrium exchange rate falls from  $E_1$  to  $E_2$ .

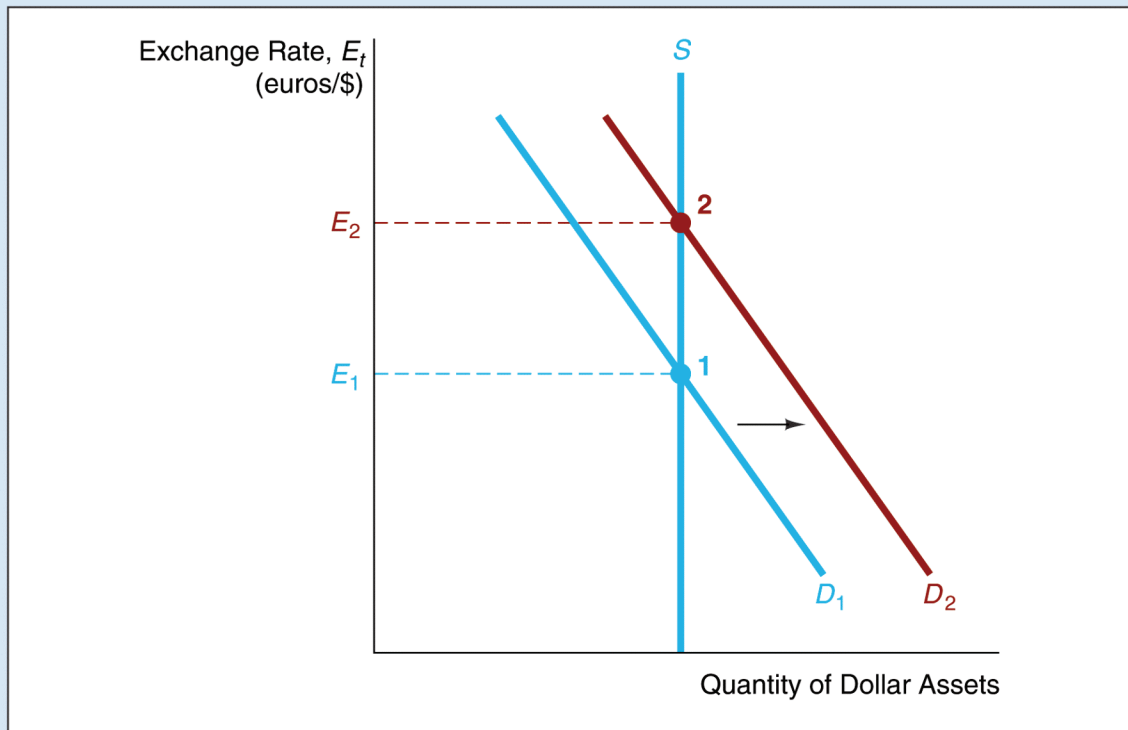




### FIGURE 6

#### Response to an Increase in the Expected Future Exchange Rate, $E_{t+1}^e$

When the expected future exchange rate increases, the relative expected return on domestic (dollar) assets rises and the demand curve shifts to the right. The equilibrium exchange rate rises from  $E_1$  to  $E_2$ .





SUMMARY		TABLE 2 Factors That Shift the Demand Curve for Domestic Assets and Affect the Exchange Rate		
Factor	Change in Factor	Change in Quantity Demanded of Domestic Assets at Each Exchange Rate	Response of Exchange Rate, $E_t$	
Domestic interest rate, $i^D$	↑	↑	↑	
Foreign interest rate, $i^F$	↑	↓	↓	
Expected domestic price level*	↑	↓	↓	
Expected trade barriers*	↑	↑	↑	

(continued)



**SUMMARY**      **TABLE 2 Factors That Shift the Demand Curve for Domestic Assets and Affect the Exchange Rate (continued)**

Factor	Change in Factor	Change in Quantity Demanded of Domestic Assets at Each Exchange Rate	Response of Exchange Rate, $E_t$	
Expected import demand	↑	↓	↓	
Expected export demand	↑	↑	↑	
Expected productivity*	↑	↑	↑	

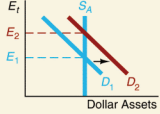
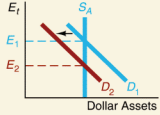





\*Relative to other countries.

Note: Only increases (↑) in the factors are shown; the effects of decreases in the variables on the exchange rate are the opposite of those indicated in the “Response” column.



**SUMMARY**

**TABLE 2 Factors That Shift the Demand Curve for Domestic Assets and Affect the Exchange Rate**

Factor	Change in Factor	Change in Quantity Demanded of Domestic Assets at Each Exchange Rate	Response of Exchange Rate, $E_t$	
Domestic interest rate, $i^D$	↑	↑	↑	
Foreign interest rate, $i^F$	↑	↓	↓	
Expected domestic price level*	↑	↓	↓	
Expected trade barriers*	↑	↑	↑	
Expected import demand	↑	↓	↓	
Expected export demand	↑	↑	↑	
Expected productivity*	↑	↑	↑	

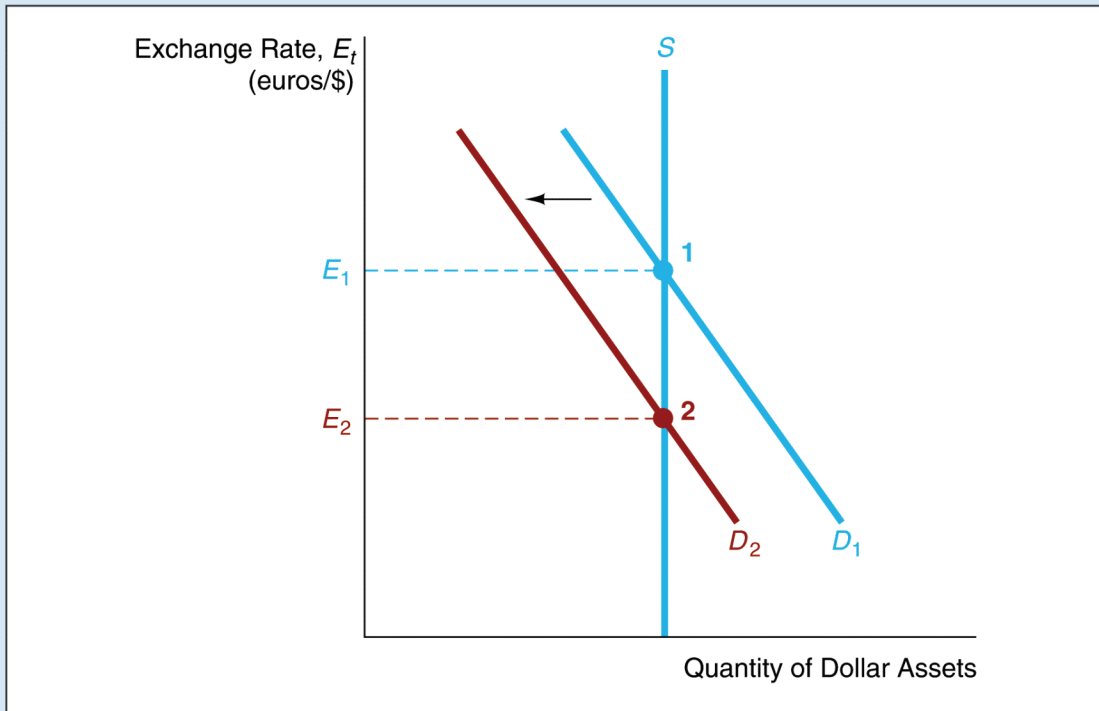
\*Relative to other countries.  
 Note: Only increases (↑) in the factors are shown; the effects of decreases in the variables on the exchange rate are the opposite of those indicated in the "Response" column.



### FIGURE 7

#### Effect of a Rise in the Domestic Interest Rate as a Result of an Increase in Expected Inflation

Because a rise in domestic expected inflation leads to a decline in expected dollar appreciation that is larger than the increase in the domestic interest rate, the relative expected return on domestic (dollar) assets falls. The demand curve shifts to the left, and the equilibrium exchange rate falls from  $E_1$  to  $E_2$ .





# Exchange Rate Overshooting

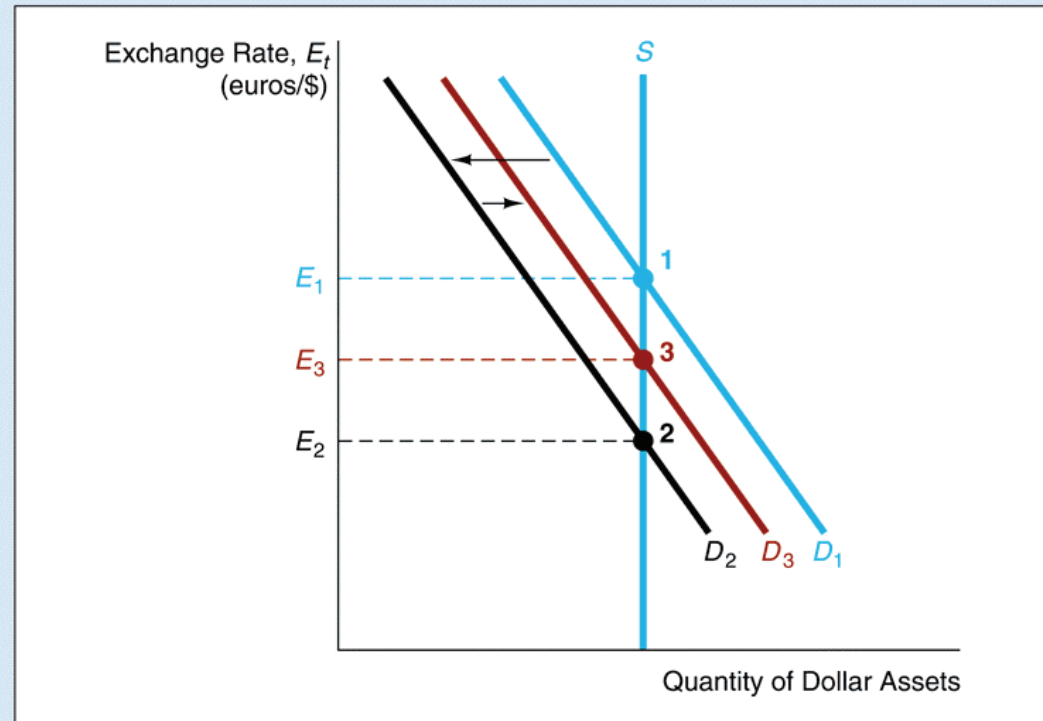
- Monetary Neutrality
  - ◆ In the long run, a one-time percentage rise in the money supply is matched by the same one-time percentage rise in the price level
- The exchange rate falls by more in the short run than in the long run
  - ◆ Helps to explain why exchange rates exhibit so much volatility



## FIGURE 8

### Effect of a Rise in the Money Supply

A rise in the money supply leads to a higher domestic price level, which in turn leads to a lower expected future exchange rate. In addition, the higher money supply leads to a decline in domestic interest rates. The decline in both the expected appreciation of the dollar and the domestic interest rate lowers the relative expected return on dollar assets, shifting the demand curve leftward from  $D_1$  to  $D_2$ . In the short run, the equilibrium exchange rate falls from  $E_1$  to  $E_2$ . In the long run, however, the interest rate rises back up again to its initial level and the demand curve shifts rightward to  $D_3$ . The exchange rate rises from  $E_2$  to  $E_3$  in the long run.

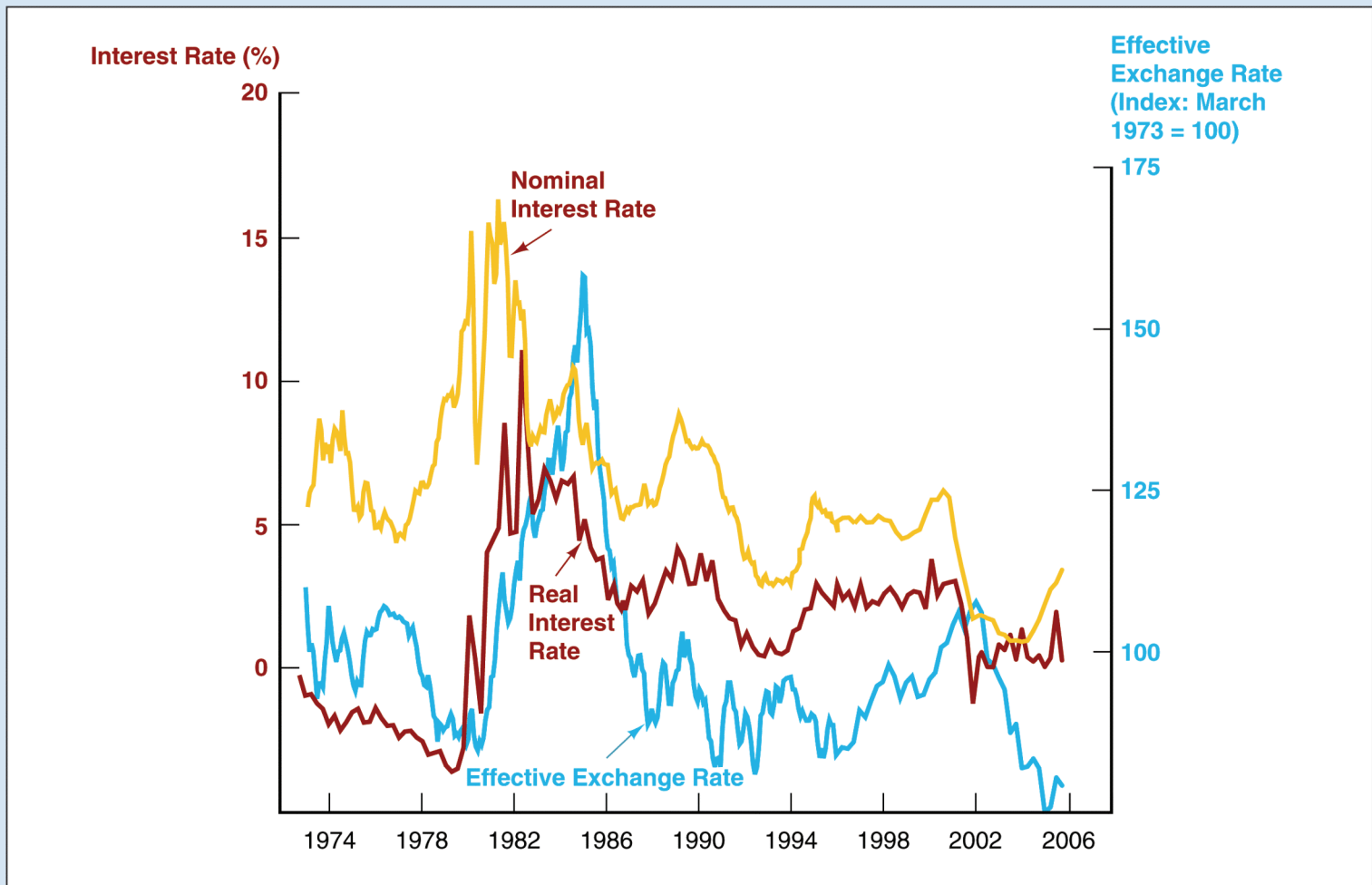






# The Dollar and Interest Rates

- While there is a strong correspondence between real interest rates and the exchange rate, the relationship between nominal interest rates and exchange rate movements is not nearly as pronounced



**FIGURE 9 Value of the Dollar and Interest Rates, 1973–2005**

Sources: Federal Reserve: [www.federalreserve.gov/releases/h10/summary/indexn\\_m.txt](http://www.federalreserve.gov/releases/h10/summary/indexn_m.txt); real interest rate from Figure 1 in Chapter 4.