rate rises, there is a higher expected depreciation of the dollar and so a higher expected appreciation of the euro, thereby increasing the expected return on euro deposits. Finally, when the exchange rate has risen to $E^* = 1$ euro per dollar, the expected return on euro deposits has risen enough so that it again equals the expected return on dollar deposits.

Explaining Changes in Exchange Rates

To explain how an exchange rate changes over time, we have to understand the factors that shift the expected-return schedules for domestic (dollar) deposits and foreign (euro) deposits.

Shifts in the Expected-Return Schedule for Foreign Deposits

As we have seen, the expected return on foreign (euro) deposits depends on the foreign interest rate i^F minus the expected appreciation of the dollar $(E^e_{t+1} - E_t)/E_t$. Because a change in the current exchange rate E_t results in a movement along the expected-return schedule for euro deposits, factors that shift this schedule must work through the foreign interest rate i^F and the expected future exchange rate E^e_{t+1}. We examine the effect of changes in these factors on the expected-return schedule for euro deposits R^F, holding everything else constant.

Study Guide

To grasp how the expected-return schedule for euro deposits shifts, just think of yourself as an investor who is considering putting funds into foreign deposits. When a variable changes (i^F, for example), decide whether at a given level of the current exchange rate, holding all other variables constant, you would earn a higher or lower expected return on euro deposits.

Changes in the Foreign Interest Rate. If the interest rate on foreign deposits i^F increases, holding everything else constant, the expected return on these deposits must also increase. Hence at a given exchange rate, the increase in i^F leads to a rightward shift in the expected-return schedule for euro deposits from R^F_1 to R^F_2 in Figure 4. As you can see in the figure, the outcome is a depreciation of the dollar from E_1 to E_2. An alternative way to see this is to recognize that the increase in the expected return on euro deposits at the original equilibrium exchange rate resulting from the rise in i^F means that people will want to buy euros and sell dollars, so the value of the dollar must fall. Our analysis thus generates the following conclusion: ***An increase in the foreign interest rate i^F shifts the R^F schedule to the right and causes the domestic currency to depreciate ($E\downarrow$).***

Conversely, if i^F falls, the expected return on euro deposits falls, the R^F schedule shifts to the left, and the exchange rate rises. This yields the following conclusion: ***A decrease in i^F shifts the R^F schedule to the left and causes the domestic currency to appreciate ($E\uparrow$).***

Changes in the Expected Future Exchange Rate. Any factor that causes the expected future exchange rate E^e_{t+1} to fall decreases the expected appreciation of the dollar and hence raises the expected appreciation of the euro. The result is a higher expected return

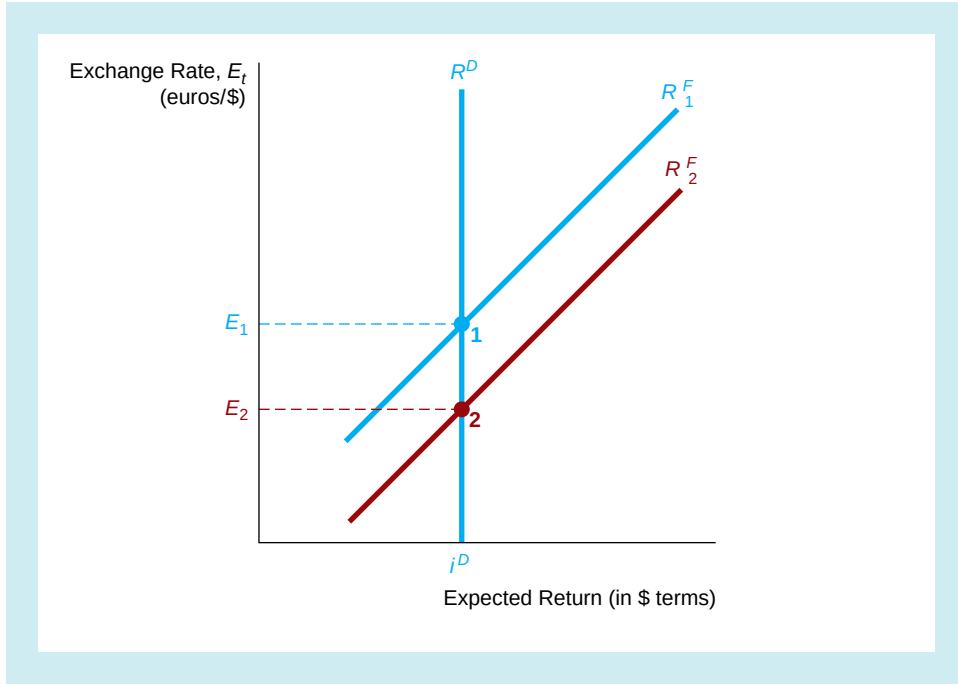


FIGURE 4 Shifts in the Schedule for the Expected Return on Foreign Deposits R^F

An increase in the expected return on foreign deposits, which occurs when either the foreign interest rate rises or the expected future exchange rate falls, shifts the schedule for the expected return on foreign deposits from R^F_1 to R^F_2, and the exchange rate falls from E_1 to E_2.

on euro deposits, which shifts the schedule for the expected return on euro deposits to the right and leads to a decline in the exchange rate as in Figure 4. Conversely, a rise in E^e_{t+1} raises the expected appreciation of the dollar, lowers the expected return on foreign deposits, shifts the R^F schedule to the left, and raises the exchange rate. To summarize, ***a rise in the expected future exchange rate shifts the R^F schedule to the left and causes an appreciation of the domestic currency; a fall in the expected future exchange rate shifts the R^F schedule to the right and causes a depreciation of the domestic currency.***

Summary. Our analysis of the long-run determinants of the exchange rate indicates the factors that influence the expected future exchange rate: the relative price level, relative tariffs and quotas, import demand, export demand, and relative productivity (refer to Table 1). The theory of purchasing power parity suggests that if a higher American price level relative to the foreign price level is expected to persist, the dollar will depreciate in the long run. A higher expected relative American price level should thus have a tendency to lower E^e_{t+1}, raise the expected return on euro deposits, shift the R^F schedule to the right, and lower the current exchange rate.

Similarly, the other long-run determinants of the exchange rate we discussed earlier can also influence the expected return on euro deposits and the current exchange rate. Briefly, the following changes will lower E^e_{t+1}, increase the expected return on euro deposits, shift the R^F schedule to the right, and cause a depreciation of the domestic currency, the dollar: (1) expectations of a rise in the American price level relative to the foreign price level, (2) expectations of lower American trade barriers relative to foreign trade barriers, (3) expectations of higher American import demand, (4) expectations of lower foreign demand for American exports, and (5) expectations of lower American productivity relative to foreign productivity.

Shifts in the Expected-Return Schedule for Domestic Deposits

Since the expected return on domestic (dollar) deposits is just the interest rate on these deposits i^D, this interest rate is the only factor that shifts the schedule for the expected return on dollar deposits.

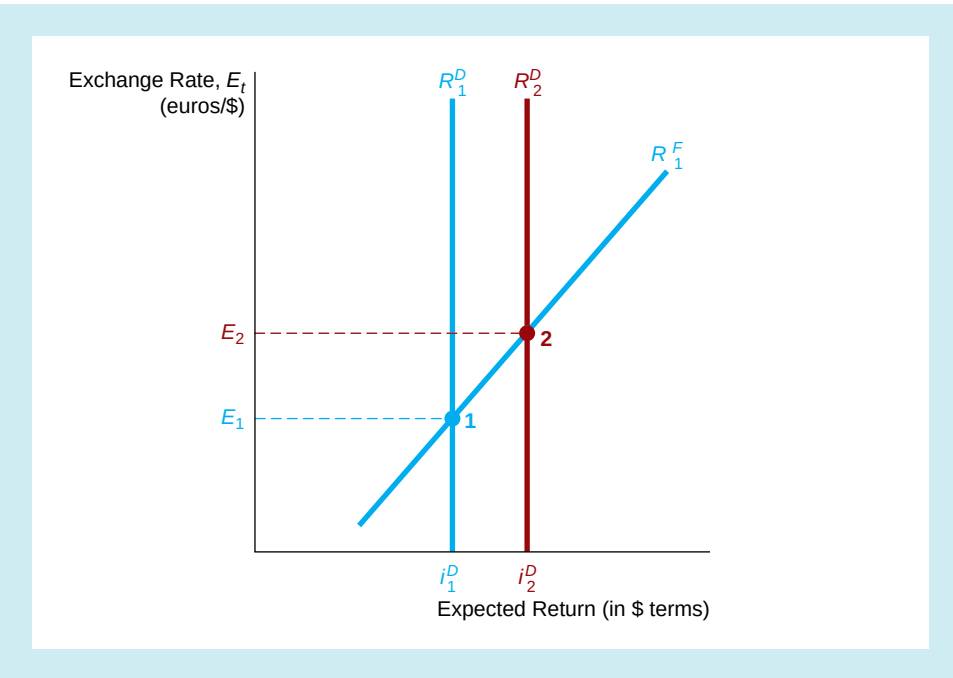
Changes in the Domestic Interest Rate. A rise in i^D raises the expected return on dollar deposits, shifts the R^D schedule to the right, and leads to a rise in the exchange rate, as is shown in Figure 5. Another way of seeing this is to recognize that a rise in i^D, which raises the expected return on dollar deposits, creates an excess demand for dollar deposits at the original equilibrium exchange rate, and the resulting purchases of dollar deposits cause an appreciation of the dollar. ***A rise in the domestic interest rate i^D shifts the R^D schedule to the right and causes an appreciation of the domestic currency; a fall in i^D shifts the R^D schedule to the left and causes a depreciation of the domestic currency.***

Study Guide

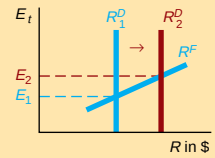
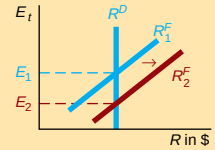
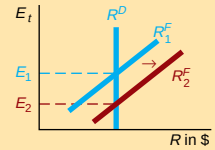
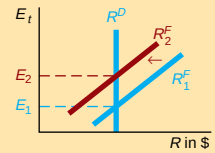
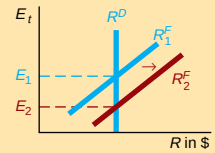
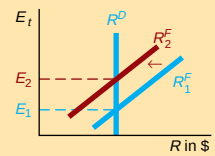
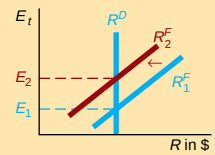
As a study aid, the factors that shift the R^F and R^D schedules and lead to changes in the current exchange rate E_t are listed in Table 2. The table shows what happens to the exchange rate when there is an increase in each of these variables, holding everything else constant. To give yourself practice, see if you can work out what happens to the R^F and R^D schedules and to the exchange rate if each of these factors falls rather than rises. Check your answers by seeing if you get the opposite change in the exchange rate to those indicated in Table 2.

FIGURE 5 Shifts in the Schedule for the Expected Return on Domestic Deposits R^D

An increase in the expected return on dollar deposits i^D shifts the expected return on domestic (dollar) deposits from R_1^D to R_2^D and the exchange rate from E_1 to E_2.



SUMMARY Table 2 Factors That Shift the R^F and R^D Schedules and Affect the Exchange Rate

Factor	Change in Factor	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.

Application

Changes in the Equilibrium Exchange Rate: Two Examples

Our analysis has revealed the factors that affect the value of the equilibrium exchange rate. Now we use this analysis to take a close look at the response of the exchange rate to changes in interest rates and money growth.

Changes in Interest Rates

Changes in domestic interest rates i^D are often cited as a major factor affecting exchange rates. For example, we see headlines in the financial press like this one: "Dollar Recovers As Interest Rates Edge Upward." But is the view presented in this headline always correct?

Not necessarily, because to analyze the effects of interest rate changes, we must carefully distinguish the sources of the changes. The Fisher equation (Chapter 4) states that a (nominal) interest rate equals the *real* interest rate plus expected inflation: $i = i_r + \pi^e$. The Fisher equation indicates that an interest rate i can change for two reasons: Either the real interest rate i_r changes or the expected inflation rate π^e changes. The effect on the exchange rate is quite different, depending on which of these two factors is the source of the change in the nominal interest rate.

Suppose that the domestic real interest rate increases so that the nominal interest rate i^D rises while expected inflation remains unchanged. In this case, it is reasonable to assume that the expected appreciation of the dollar will be unchanged because expected inflation is unchanged, and so the expected return on foreign deposits will remain unchanged for any given exchange rate. The result is that the R^F schedule stays put and the R^D schedule shifts to the right, and we end up with the situation depicted in Figure 5, which analyzes an increase in i^D, holding everything else constant. Our model of the foreign exchange market produces the following result: ***When domestic real interest rates rise, the domestic currency appreciates.***

When the nominal interest rate rises because of an increase in expected inflation, we get a different result from the one shown in Figure 5. The rise in expected domestic inflation leads to a decline in the expected appreciation of the dollar (a higher appreciation of the euro), which is typically thought to be larger than the increase in the domestic interest rate i^D.[5] As a result, at any given exchange rate, the expected return on foreign deposits rises more than the expected return on dollar deposits. Thus, as we see in Figure 6, the R^F schedule shifts to the right more than the R^D schedule, and the exchange rate falls. Our analysis leads to this conclusion: ***When domestic interest rates rise due to an expected increase in inflation, the domestic currency depreciates.***

Because this conclusion is completely different from the one reached when the rise in the domestic interest rate is associated with a higher real

[5]This conclusion is standard in asset market models of exchange rate determination; see Rudiger Dornbusch, "Expectations and Exchange Rate Dynamics," *Journal of Political Economy* 84 (1976): 1061–1076. It is also consistent with empirical evidence that suggests that nominal interest rates do not rise one-for-one with increases in expected inflation. See Frederic S. Mishkin, "The Real Interest Rate: An Empirical Investigation," *Carnegie-Rochester Conference Series on Public Policy* 15 (1981): 151–200; and Lawrence Summers, "The Nonadjustment of Nominal Interest Rates: A Study of the Fisher Effect," in *Macroeconomics, Prices and Quantities*, ed. James Tobin (Washington, D.C.: Brookings Institution, 1983), pp. 201–240.

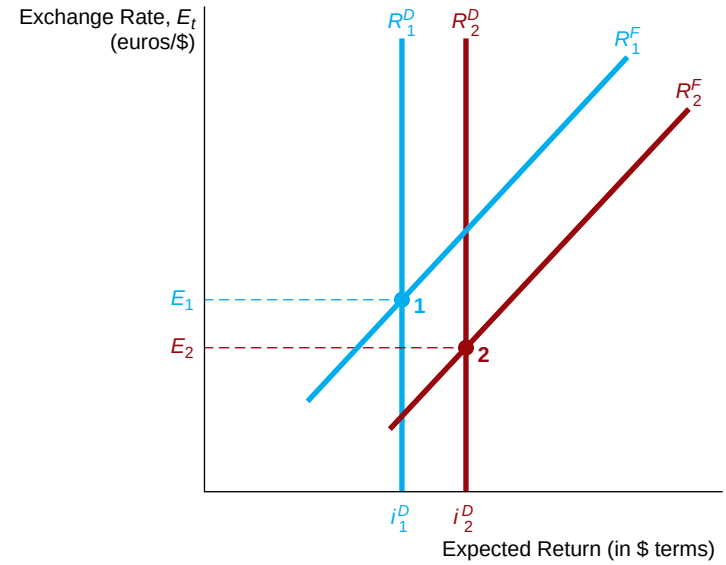


FIGURE 6 Effect of a Rise in the Domestic Nominal Interest Rate as a Result of an Increase in Expected Inflation

Because a rise in domestic expected inflation leads to a decline in expected dollar appreciation that is larger than the resulting increase in the domestic interest rate, the expected return on foreign deposits rises by more than the expected return on domestic (dollar) deposits. R^F shifts to the right more than R^D, and the equilibrium exchange rate falls from E_1 to E_2.

interest rate, we must always distinguish between *real* and *nominal* measures when analyzing the effects of interest rates on exchange rates.

Changes in the Money Supply

Suppose that the Federal Reserve decides to increase the level of the money supply in order to reduce unemployment, which it believes to be excessive. The higher money supply will lead to a higher American price level in the long run (as we will see in Chapter 25) and hence to a lower expected future exchange rate. The resulting decline in the expected appreciation of the dollar increases the expected return on foreign deposits at any given current exchange rate and so shifts the R^F schedule rightward from R_1^F to R_2^F in Figure 7. In addition, the higher money supply will lead to a higher real money supply M/P because the price level does not immediately increase in the short run. As suggested in Chapter 5, the resulting rise in the real money supply causes the domestic interest rate to fall from i_1^D to i_2^D, which lowers the expected return on domestic (dollar) deposits, shifting the R^D schedule leftward from R_1^D to R_2^D. As we can see in Figure 7, the result is a decline in the exchange rate from E_1 to E_2. The conclusion is this: ***A higher domestic money supply causes the domestic currency to depreciate.***

Exchange Rate Overshooting

Our analysis of the effect of an increase in the money supply on the exchange rate is not yet over—we still need to look at what happens to the exchange rate in the long run. A basic proposition in monetary theory, called **monetary neutrality**, states that 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, leaving unchanged the real money supply and all other economic variables such as interest rates. An intuitive way to understand this proposition

is to think of what would happen if our government announced overnight that an old dollar would now be worth 100 new dollars. The money supply in new dollars would be 100 times its old value and the price level would also be 100 times higher, but nothing in the economy would really have changed; real and nominal interest rates and the real money supply would remain the same. Monetary neutrality tells us that in the long run, the rise in the money supply would not lead to a change in the domestic interest rate and so it would return to i_1^D in the long run, and the schedule for the expected return on domestic deposits would return to R_1^D. As we can see in Figure 7, this means that the exchange rate would rise from E_2 to E_3 in the long run.

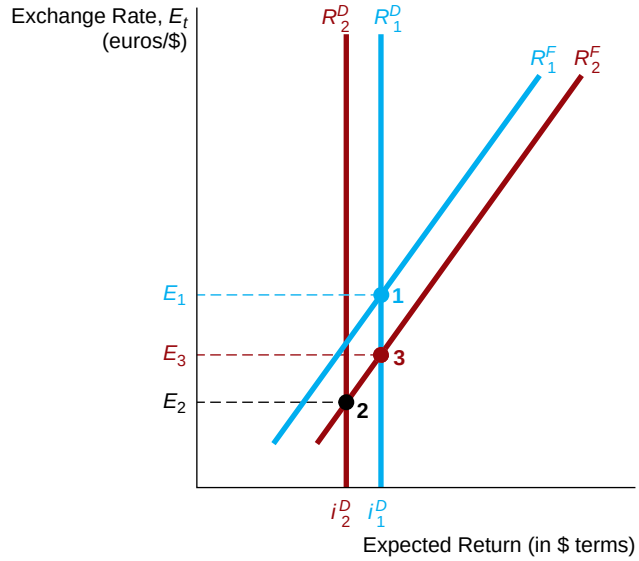
The phenomenon we have described here in which the exchange rate falls by more in the short run than it does in the long run when the money supply increases is called **exchange rate overshooting**. It is important because, as we will see in the following application, it can help explain why exchange rates exhibit so much volatility.

A phenomenon whereby the exchange rate changes by more in the short run than it does in the long run when the money supply changes.

Another way of thinking about why exchange rate overshooting occurs is to recognize that when the domestic interest rate falls in the short run, equilibrium in the foreign exchange market means that the expected return on foreign deposits must be lower. With the foreign interest rate given, this lower expected return on foreign deposits means that there must be an expected appreciation of the dollar (depreciation of the euro) in order for the expected return on foreign deposits to decline when the domestic interest rate falls. This can occur only if the current exchange rate falls below its long-run value.

FIGURE 7 Effect of a Rise in the Money Supply

A rise in the money supply leads to a higher domestic price level in the long run, which in turn leads to a lower expected future exchange rate. The resulting decline in the expected appreciation of the dollar raises the expected return on foreign deposits, shifting the R^F schedule rightward from R_1^F to R_2^F. In the short run, the domestic interest rate i^D falls, shifting R^D from R_1^D to R_2^D. The short-run outcome is that the exchange rate falls from E_1 to E_2. In the long run, however, the interest rate returns to i_1^D and R^D returns to R_1^D. The exchange rate thus rises from E_2 to E_3 in the long run.



Application

Why Are Exchange Rates So Volatile?

The high volatility of foreign exchange rates surprises many people. Thirty or so years ago, economists generally believed that allowing exchange rates to be determined in the free market would not lead to large fluctuations in their values. Recent experience has proved them wrong. If we return to Figure 1, we see that exchange rates over the 1980–2002 period have been very volatile.

The asset market approach to exchange rate determination that we have outlined in this chapter gives a straightforward explanation of volatile exchange rates. Because expected appreciation of the domestic currency affects the expected return on foreign deposits, expectations about the price level, inflation, trade barriers, productivity, import demand, export demand, and the money supply play important roles in determining the exchange rate. When expectations about any of these variables change, our model indicates that there will be an immediate effect on the expected return on foreign deposits and therefore on the exchange rate. Since expectations on all these variables change with just about every bit of news that appears, it is not surprising that the exchange rate is volatile. In addition, we have seen that our exchange rate analysis produces exchange rate overshooting when the money supply increases. Exchange rate overshooting is an additional reason for the high volatility of exchange rates.

Because earlier models of exchange rate behavior focused on goods markets rather than asset markets, they did not emphasize changing expectations as a source of exchange rate movements, and so these earlier models could not predict substantial fluctuations in exchange rates. The failure of earlier models to explain volatility is one reason why they are no longer so popular. The more modern approach developed here emphasizes that the foreign exchange market is like any other asset market in which expectations of the future matter. The foreign exchange market, like other asset markets such as the stock market, displays substantial price volatility, and foreign exchange rates are notoriously hard to forecast.

Application

The Dollar and Interest Rates, 1973–2002

In the chapter preview, we mentioned that the dollar was weak in the late 1970s, rose substantially from 1980 to 1985, and declined thereafter. We can use our analysis of the foreign exchange market to understand exchange rate movements and help explain the dollar's rise and fall in the 1980s.

Some important information for tracing the dollar's changing value is presented in Figure 8, which plots measures of real and nominal interest rates and the value of the dollar in terms of a basket of foreign currencies (called an **effective exchange rate index**). We can see that the value of the dollar and the measure of real interest rates tend to rise and fall together. In the late 1970s, real interest rates were at low levels, and so was the value of the dollar. Beginning in 1980, however, real interest rates in the United States began

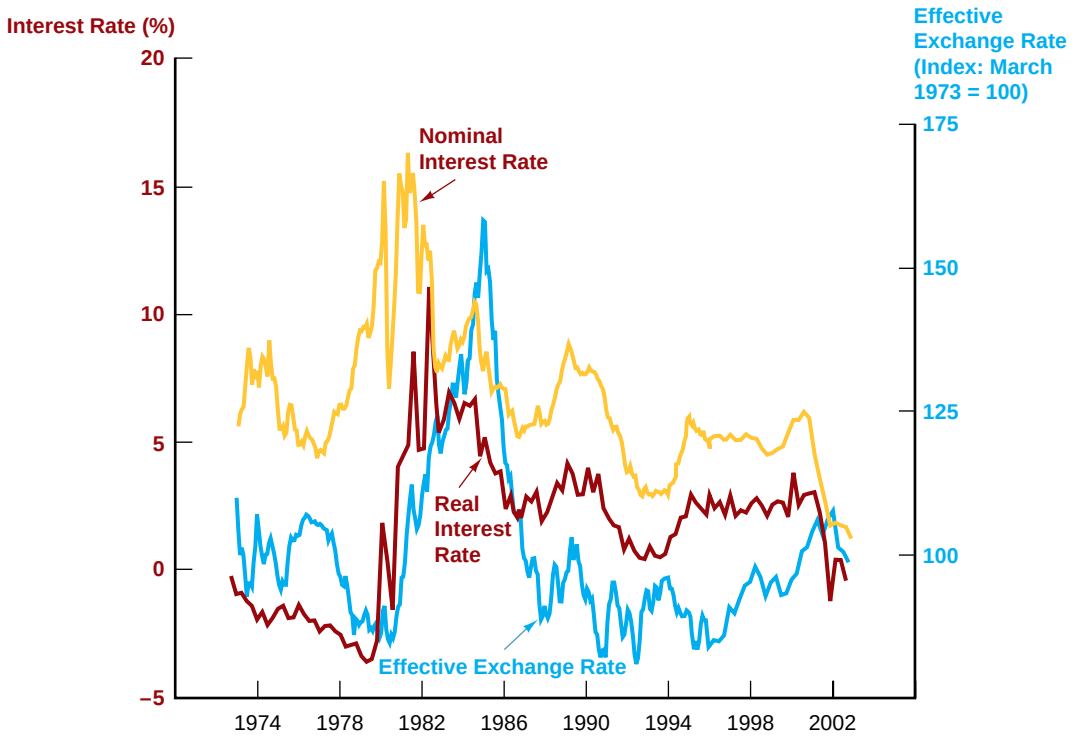


FIGURE 8 Value of the Dollar and Interest Rates, 1973–2002

Sources: Federal Reserve: www.federalreserve.gov/releases/h10/summary/indexn_m.txt; real interest rate from Figure 1 in Chapter 4.

to climb sharply, and at the same time so did the dollar. After 1984, the real interest rate declined substantially, as did the dollar.

Our model of exchange rate determination helps explain the rise and fall in the dollar in the 1980s. As Figure 5 indicates, a rise in the U.S. real interest rate raises the expected return on dollar deposits while leaving the expected return on foreign deposits unchanged. The resulting increased demand for dollar deposits then leads to purchases of dollar deposits (and sales of foreign deposits), which raise the exchange rate. This is exactly what occurred in the 1980–1984 period. The subsequent fall in U.S. real interest rates then lowered the expected return on dollar deposits relative to foreign deposits, and the resulting sales of dollar deposits (and purchases of foreign deposits) lowered the exchange rate.

The plot of *nominal* interest rates in Figure 8 also demonstrates that the correspondence between nominal interest rates and exchange rate movements is not nearly as close as that between *real* interest rates and exchange rate movements. This is also exactly what our analysis predicts. The rise in nominal interest rates in the late 1970s was not reflected in a corresponding rise in the value of the dollar; indeed, the dollar actually fell in the late 1970s.

Figure 8 explains why the rise in nominal rates in the late 1970s did not produce a rise in the dollar. As a comparison of the real and nominal interest rates in the late 1970s indicates, the rise in nominal interest rates reflected an increase in expected inflation and not an increase in real interest rates. As our analysis in Figure 6 demonstrates, the rise in nominal interest rates stemming from a rise in expected inflation should lead to a decline in the dollar, and that is exactly what happened.

If there is a moral to the story, it is that a failure to distinguish between real and nominal interest rates can lead to poor predictions of exchange rate movements: The weakness of the dollar in the late 1970s and the strength of the dollar in the early 1980s can be explained by movements in *real* interest rates but not by movements in *nominal* interest rates.

Application

The Euro's First Four Years

With much fanfare, the euro debuted on January 1, 1999, at an exchange rate of 1.18 dollars per euro. Despite initial hopes that the euro would be a strong currency, it has proved to be weak, declining 30% to a low of 83 cents per euro in October 2000, only to recover to 1.05 dollars per euro by the beginning of 2003. What explains the weakness of the euro in its first two years, and its recovery in its third and fourth year?

The previous application has shown that changes in real interest rates are an important factor determining the exchange rate. When the domestic real interest rate falls relative to the foreign real interest rate, the domestic currency declines in value. Indeed, this is exactly what has happened to the euro. While the euro was coming into existence, European economies were experiencing only slow recoveries from recession, thus causing both real and nominal interest rates to fall. In contrast, in 1999 and 2000, the United States experienced very rapid growth, substantially above their European counterparts. As in the analysis of the previous application, low real interest rates in Europe relative to those in the United States drove down the value of the euro.

With the slowing of the U.S. economy, which entered into recession in the spring of 2001, the process reversed. The U.S. growth rate fell slightly behind Europe's, so that U.S. relative real and nominal interest rates fell, setting the stage for a recovery in the euro.

Application

Reading the *Wall Street Journal*: The "Currency Trading" Column

Now that we have an understanding of how exchange rates are determined, we can use our analysis to understand discussions about developments in the foreign exchange market reported in the financial press.

Every day, the *Wall Street Journal* reports on developments in the foreign exchange market on the previous business day in its "Currency

Trading" column, an example of which is presented in the "Following the Financial News" box.

The column indicates that concerns about a possible war against Iraq and weak economic data have put downward pressure on the U.S. dollar. Our analysis of the foreign exchange market explains why these developments have led to a weak dollar.

Following the Financial News

The "Currency Trading" Column

The "Currency Trading" column appears daily in the *Wall Street Journal*; an example is presented here. It is usually found in the third section, "Money and Investing."

CURRENCY TRADING

Concerns About War Put Pressure on the Dollar

By Grainne McCarthy
Dow Jones Newswires

NEW YORK—Having fallen swiftly on the back of some surprisingly weak U.S. employment data, the dollar is set to remain under pressure this week, increasingly vulnerable to the drumbeat of war surrounding Iraq and nuclear saber-rattling in North Korea.

"People are positioned for Armageddon on the dollar. In that scenario, you can get wacky moves," says Paul Podolsky, chief strategist at Fleet Global Markets in Boston.

Investors unsure of the dollar's vulnerability to the U.S. economic data got a resounding wake-up call Friday, with the currency tumbling swiftly after the government reported a dismal December payrolls report that fueled concerns about the lingering soft spot dogging the world's largest economy. The dollar hit a fresh three-year trough against the euro, while sliding to its weakest point against the Swiss franc in four years.

In late New York trading Friday, the euro was at $1.0579, up steeply from $1.0488 late Thursday. Against the Swiss franc, the dollar was at 1.3799 francs, down sharply from 1.3912 francs, while sterling was at $1.6084, modestly up from $1.6064. The dollar was at 119.16 yen, modestly lower than 119.30 yen Thursday.

Even as Canada reported another remarkably strong month of employment growth, job losses in the U.S. soared to 101,000, far from consensus forecasts for a modest increase of 20,000.

There were clearly some seasonal explanations for the leap, but the report still underscored a view that the sluggish U.S. economic recovery isn't creating jobs. That potentially bodes ill for the dollar at a time when it is already being undermined by war concerns.

"Until Iraq goes away and the outlook for consumer confidence and business spending improves, the dollar is going to remain under pressure," said Jay Bryson, global economist at Wachovia Securities in Charlotte, N.C.

There will certainly be plenty of economic data this week for dollar investors to sink their teeth into, with the focus most likely on somewhat stronger economic activity and benign inflation. Retail sales for December, to be reported tomorrow, are expected to come in very firm, mostly because of the 18% jump in auto sales already reported. But excluding autos, economists anticipate just a 0.3% increase.

The U.S. will also get December's producer-price and consumer-price indexes on Wednesday and Thursday, respectively. The focus for Friday will be squarely on the initial University of Michigan consumer-sentiment report for January, which should provide a glimpse of how confidence is holding up amid growing war jitters.

But aside from the clear significance of much of these data, many analysts expect the dollar to look more to the Pentagon, State Department and, ultimately, the White House for signposts for near-term direction.

As the central emblem in financial markets of the world's only superpower, the dollar is beset by multiple threats to global stability that are breaking out on several fronts. As well as the situations in North Korea and Iraq, the continuing battle against terrorist network al Qaeda is high on the list of issues facing the Bush administration. The U.S., given its position of global hegemony, has almost by default become the first line of defense in tackling these challenges.

"Connect the dots, and what emerges is hardly encouraging for the dollar in particular and the financial markets in general," said Joseph Quinlan, global economist at Johns Hopkins University.

He argues that investors in U.S. assets, while certainly cognizant of a war risk, may have priced in an overly rosy scenario under which the war on terrorism has already been won, the war against Iraq has already been priced in, and a war on the Korean peninsula is too remote a possibility to take seriously.

An upset to this more optimistic picture could weigh more heavily on global capital flows, ultimately depressing the dollar, given the U.S.'s status as a creditor nation dependent on capital inflows to finance the current account.

Source: Wall Street Journal, Monday, January 13, 2003, p. C16.

The column starts by pointing out that surprisingly weak U.S. employment data has led to a falling dollar. The weakness in the U.S. economy suggests that real interest rates in the United States are likely to fall in the future. As a result, in the future we have the opposite scenario to Figure 5 occurring, the R^D curve shifts to the left, lowering the value of the dollar. The future decline in the dollar then means that the foreign currency is expected to appreciate, thus raising the expected return on foreign deposits today and shifting the R^F curve to the right. Thus as we see in Figure 4 the dollar declines today.

Concerns about a war with Iraq also have a similar impact. The possibility that the war in Iraq might not go well and could lead to increased terrorist incidents suggests that the U.S. economy might suffer negative consequences. This provides an additional reason for a possible weakening of the economy and we then get the identical analysis to that in the paragraph above, which shows that the U.S. dollar would fall in response to these war fears.

Summary

1. Foreign exchange rates (the price of one country's currency in terms of another's) are important because they affect the price of domestically produced goods sold abroad and the cost of foreign goods bought domestically.
2. The theory of purchasing power parity suggests that long-run changes in the exchange rate between two countries are determined by changes in the relative price levels in the two countries. Other factors that affect exchange rates in the long run are tariffs and quotas, import demand, export demand, and productivity.
3. Exchange rates are determined in the short run by the interest parity condition, which states that the expected return on domestic deposits is equal to the expected return on foreign deposits.
4. Any factor that changes the expected returns on domestic or foreign deposits will lead to changes in the exchange rate. Such factors include changes in the interest rates on domestic and foreign deposits as well as changes in any of the factors that affect the long-run exchange rate and hence the expected future exchange rate. Changes in the money supply lead to exchange rate overshooting, causing the exchange rate to change by more in the short run than in the long run.
5. The asset market approach to exchange rate determination can explain both the volatility of exchange rates and the rise of the dollar in the 1980–1984 period and its subsequent fall.

Key Terms

appreciation, p. 436
capital mobility, p. 445
depreciation, p. 436
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Questions and Problems

Questions marked with an asterisk are answered at the end of the book in an appendix, "Answers to Selected Questions and Problems."

1. When the euro appreciates, are you more likely to drink California or French wine?

*2. "A country is always worse off when its currency is weak (falls in value)." Is this statement true, false, or uncertain? Explain your answer.

3. In a newspaper, check the exchange rates for the foreign currencies listed in the "Following the Financial News" box on page 437. Which of these currencies have appreciated and which have depreciated since February 5, 2003?

*4. If the Japanese price level rises by 5% relative to the price level in the United States, what does the theory of purchasing power parity predict will happen to the value of the Japanese yen in terms of dollars?

5. If the demand for a country's exports falls at the same time that tariffs on imports are raised, will the country's currency tend to appreciate or depreciate in the long run?

*6. In the mid- to late 1970s, the yen appreciated relative to the dollar even though Japan's inflation rate was higher than America's. How can this be explained by an improvement in the productivity of Japanese industry relative to American industry?

Using Economic Analysis to Predict the Future

Answer the remaining questions by drawing the appropriate exchange market diagrams.

7. The president of the United States announces that he will reduce inflation with a new anti-inflation program. If the public believes him, predict what will happen to the U.S. exchange rate.

*8. If the British central bank prints money to reduce unemployment, what will happen to the value of the pound in the short run and the long run?

9. If the Canadian government unexpectedly announces that it will be imposing higher tariffs on foreign goods one year from now, what will happen to the value of the Canadian dollar today?

*10. If nominal interest rates in America rise but real interest rates fall, predict what will happen to the U.S. exchange rate.

11. If American auto companies make a breakthrough in automobile technology and are able to produce a car that gets 60 miles to the gallon, what will happen to the U.S. exchange rate?

*12. If Americans go on a spending spree and buy twice as much French perfume, Japanese TVs, English sweaters, Swiss watches, and Italian wine, what will happen to the value of the U.S. dollar?

13. If expected inflation drops in Europe so that interest rates fall there, predict what will happen to the U.S. exchange rate.

*14. If the European central bank decides to contract the money supply in order to fight inflation, what will happen to the value of the U.S. dollar?

15. If there is a strike in France, making it harder to buy French goods, what will happen to the value of the euro?

Web Exercises

1. The Federal Reserve maintains a web site that lists the exchange rate between the U.S. dollar and many other currencies. Go to www.federalreserve.gov/releases/H10/hist/. Go to the historical data from 1999 and later and find the Euro.
   a. What has the percentage change in the Euro-dollar exchange rate been between introduction and now?
   b. What has been the annual percentage change in the Euro-dollar exchange rate for each year since the Euro's introduction?
2. International travelers and business people frequently need to accurately convert from one currency to another. It is often easy to find the rate needed to convert the U.S. dollar into another currency. It can be more difficult to find cross-conversion rates. Go to www.oanda.com/convert/classic. This site lets you convert from any currency into any other currency. How many Lithuanian Litas can you currently buy with one Chilean Peso?