return, the rate at which its value expressed in terms of a representative output basket is expected to rise.

4. When relative asset returns are relevant, as in the foreign exchange market, it is appropriate to compare expected changes in assets’ currency values, provided those values are expressed in the same currency. If risk and liquidity factors do not strongly influence the demands for foreign currency assets, participants in the foreign exchange market always prefer to hold those assets yielding the highest expected rate of return.

5. The returns on deposits traded in the foreign exchange market depend on interest rates and expected exchange rate changes. To compare the expected rates of return offered by dollar and euro deposits, for example, the return on euro deposits must be expressed in dollar terms by adding to the euro interest rate the expected rate of depreciation of the dollar against the euro (or rate of appreciation of the euro against the dollar) over the deposit’s holding period.

6. Equilibrium in the foreign exchange market requires interest parity; that is, deposits of all currencies must offer the same expected rate of return when returns are measured in comparable terms.

7. For given interest rates and a given expectation of the future exchange rate, the interest parity condition tells us the current equilibrium exchange rate. When the expected dollar return on euro deposits exceeds that on dollar deposits, for example, the dollar immediately depreciates against the euro. Other things equal, a dollar depreciation today reduces the expected dollar return on euro deposits by reducing the depreciation rate of the dollar against the euro expected for the future. Similarly, when the expected return on euro deposits is below that on dollar deposits, the dollar must immediately appreciate against the euro. Other things equal, a current appreciation of the dollar makes euro deposits more attractive by increasing the dollar’s expected future depreciation against the European currency.

8. All else equal, a rise in dollar interest rates causes the dollar to appreciate against the euro while a rise in euro interest rates causes the dollar to depreciate against the euro. Today’s exchange rate is also altered by changes in its expected future level. If there is a rise in the expected future level of the dollar/euro rate, for example, then at unchanged interest rates, today’s dollar/euro exchange rate will also rise.

**KEY TERMS**

- appreciation, p. 322
- arbitrage, p. 326
- depreciation, p. 322
- exchange rate, p. 320
- foreign exchange market, p. 324
- forward exchange rate, p. 327
- interbank trading, p. 324
- interest parity condition, p. 337
- interest rate, p. 332
- liquidity, p. 332
- rate of appreciation, p. 336
- rate of depreciation, p. 334
- rate of return, p. 329
- real rate of return, p. 329
- risk, p. 332
- spot exchange rate, p. 326
- vehicle currency, p. 326

**PROBLEMS**

1. In Munich a bratwurst costs 5 euros; a hot dog costs $4 at Boston’s Fenway Park. At an exchange rate of $1.05/per euro, what is the price of a bratwurst in terms of a hot dog? All else equal, how does this relative price change if the dollar depreciates to $1.25 per euro? Compared with the initial situation, has a hot dog become more or less expensive relative to a bratwurst?
2. A U.S. dollar costs 7.5 Norwegian kroner, but the same dollar can be purchased for 1.25 Swiss francs. What is the Norwegian krone/Swiss franc exchange rate?

3. Petroleum is sold in a world market and tends to be priced in U.S. dollars. The Nippon Steel Chemical Group of Japan must import petroleum to use in manufacturing plastics and other products. How are its profits affected when the yen depreciates against the dollar?

4. Calculate the dollar rates of return on the following assets:
   a. A painting whose price rises from $200,000 to $250,000 in a year.
   c. A £10,000 deposit in a London bank in a year when the interest rate on pounds is 10 percent and the $/£ exchange rate moves from $1.50 per pound to $1.38 per pound.

5. What would be the real rates of return on the assets in the preceding question if the price changes described were accompanied by a simultaneous 10 percent increase in all dollar prices?

6. Suppose the dollar interest rate and the pound sterling interest rate are the same, 5 percent per year. What is the relation between the current equilibrium $/£ exchange rate and its expected future level? Suppose the expected future $/£ exchange rate, $1.52 per pound, remains constant as Britain’s interest rate rises to 10 percent per year. If the U.S. interest rate also remains constant, what is the new equilibrium $/£ exchange rate?

7. Traders in asset markets suddenly learn that the interest rate on dollars will decline in the near future. Use the diagrammatic analysis of this chapter to determine the effect on the current dollar/euro exchange rate, assuming current interest rates on dollar and euro deposits do not change.

8. We noted that we could have developed our diagrammatic analysis of foreign exchange market equilibrium from the perspective of Europe, with the euro/dollar exchange rate $E_{€/$}(= 1/$E_{$/€}) on the vertical axis, a schedule vertical at $R_e$ to indicate the euro return on euro deposits, and a downward-sloping schedule showing how the euro return on dollar deposits varies with $E_{€/$}. Derive this alternative picture of equilibrium and use it to examine the effect of changes in interest rates and the expected future exchange rate. Do your answers agree with those we found earlier?


   But now the sentiment is that the economy is heading for a “soft landing,” with the economy slowing significantly and inflation subsiding, but without a recession.

   This outlook is good for the dollar for two reasons. A soft landing is not as disruptive as a recession, so the foreign investments that support the dollar are more likely to continue.

   Also, a soft landing would not force the Federal Reserve to push interest rates sharply lower to stimulate growth. Falling interest rates can put downward pressure on the dollar because they make investments in dollar-denominated securities less attractive to foreigners, prompting the selling of dollars. In addition, the optimism sparked by the expectation of a soft landing can even offset some of the pressure on the dollar from lower interest rates.

   a. Show how you would interpret the third paragraph of this report using this chapter’s model of exchange rate determination.

   b. What additional factors in exchange rate determination might help you explain the second paragraph?
10. Suppose the dollar exchange rates of the euro and the yen are equally variable. The euro, however, tends to depreciate unexpectedly against the dollar when the return on the rest of your wealth is unexpectedly high, while the yen tends to appreciate unexpectedly in the same circumstances. As a U.S. resident, which currency, the euro or the yen, would you consider riskier?

11. Does any of the discussion in this chapter lead you to believe that dollar deposits may have liquidity characteristics different from those of other currency deposits? If so, how would the differences affect the interest differential between, say, dollar and Mexican peso deposits? Do you have any guesses about how the liquidity of euro deposits may be changing over time?

12. In October 1979, the U.S. central bank (the Federal Reserve System) announced it would play a less active role in limiting fluctuations in dollar interest rates. After this new policy was put into effect, the dollar’s exchange rates against foreign currencies became more volatile. Does our analysis of the foreign exchange market suggest any connection between these two events?

13. Imagine that everyone in the world pays a tax of $\tau$ percent on interest earnings and on any capital gains due to exchange rate changes. How would such a tax alter the analysis of the interest parity condition? How does your answer change if the tax applies to interest earnings but not to capital gains, which are untaxed?

14. Suppose the one-year forward $$/€$ exchange rate is $1.26$ per euro and the spot exchange rate is $1.2$ per euro. What is the forward premium on euros (the forward discount on dollars)? What is the difference between the interest rate on one-year dollar deposits and that on one-year euro deposits (assuming no repayment risk)?

15. Europe’s single currency, the euro, was introduced in January 1999, replacing the currencies of 11 European Union members, including France, Germany, Italy, and Spain (but not Britain; see Chapter 20). Do you think that, immediately after the euro’s introduction, the value of foreign exchange trading in euros was greater or less than the euro value of the pre-1999 trade in the 11 original national currencies? Explain your answer.

16. Multinationals generally have production plants in a number of countries. Consequently, they can move production from expensive locations to cheaper ones in response to various economic developments—a phenomenon called outsourcing when a domestically based firm moves part of its production abroad. If the dollar depreciates, what would you expect to happen to outsourcing by American companies? Explain and provide an example.

FURTHER READINGS


$1.2$ /€ $1.26$