

## 15.2: Exchange Rate Volatility and Risk

### Learning Objective

1. Learn how exchange rate volatility raises risk for international traders and investors.

Probably the most important characteristic of alternative exchange rate systems is the feature used to describe them, namely fixed or floating. Fixed exchange rates, by definition, are not supposed to change. They are meant to remain fixed, preferably permanently. Floating rates float up and down and down and up from year to year, week to week, and minute by minute. What a floating exchange rate will be a year from now, or even a week from now, is often very difficult to predict.

Volatility represents the degree to which a variable changes over time. The larger the magnitude of a variable change, or the more quickly it changes over time, the more volatile it is.

Since fixed exchange rates are not supposed to change—by definition—they have no volatility. Please note the cautious wording because fixed exchange rates are quite frequently devalued or revalued, implying that they can and do indeed change. However, we will explore this issue in more detail later. A floating exchange rate may or may not be volatile depending on how much it changes over time. However, since floating exchange rates are free to change, they are usually expected to be more volatile.

Volatile exchange rates make international trade and investment decisions more difficult because volatility increases exchange rate risk. **Exchange rate risk** refers to the potential to lose money because of a change in the exchange rate. Below are two quick examples of how traders and investors may lose money when the exchange rate changes.

### Exchange Rate Risk for Traders

First consider a business that imports soccer balls into the United States. Suppose one thousand soccer balls purchased from a supplier in Pakistan costs 300,000 Pakistani rupees. At the current exchange rate of 60 Rs/\$, it will cost the importer \$5,000 dollars or \$5 per soccer ball. The importer determines that transportation, insurance, advertising, and retail costs will run about \$5 per soccer ball. If the competitive market price for this type of soccer ball is \$12, he will make a \$2 profit per ball if all balls are sold.

Suppose the shipment is scheduled to occur in three months and that payment for the shipment need not be made until that time. Let's assume the importer waits to convert currency until the payment is made and that in three months' time the Pakistani rupee has appreciated to a new value of 55 Rs/\$. The shipment cost in rupees remains the same at Rs 300,000, but the dollar value of the shipment rises to \$5,454 or \$5.45 per soccer ball. Assuming the same \$5 of extra costs and a \$12 final sale price, the importer will now make only \$1.45 profit per soccer ball, if all balls are sold. While this is still a profit, it is about 25 percent less than expected when the decision to purchase was made three months before.

This is an example of the risk an importer faces because of a change in the currency value. Of course, it is true that the currency value could have changed in the opposite direction. Had the rupee value risen to 65 Rs/\$, the shipment value would have cost just \$4,615, or \$4.62 per ball, generating a profit of \$2.38 per soccer ball. In this case, the currency moves in the importer's favor. Thus a volatile exchange rate will sometimes lead to greater losses than expected, and at other times, to greater gains.

There are several methods to protect oneself from this type of currency risk. The importer could have exchanged currency at the time the deal was struck and held his 300,000 rupees in a Pakistani bank until payment is made. However, this involves a substantial additional opportunity cost since the funds must be available beforehand and become unusable while they are held in a Pakistani bank account. Alternatively, the importer may be able to find a bank willing to write a forward exchange contract, fixing an exchange rate today for an exchange to be made three months from now.

In any case, it should be clear that exchange rate fluctuations either increase the risk of losses relative to plans or increase the costs to protect against those risks.

### Exchange Rate Risk for Investors

Volatile exchange rates also create exchange rate risk for international investors. Consider the following example. Suppose in October 2004, a U.S. resident decides to invest (i.e., save) \$10,000 for the next year. Given that the U.S. dollar had been weakening with respect to the Danish krone for several years and since the interest rate on a money market deposit was slightly higher in Denmark at 2.25 percent compared to the 1.90 percent return in the United States, the investor decides to put the \$10,000 into the Danish account. At the time of the deposit, the exchange rate sits at 5.90 kr/\$. In October 2005, the depositor cashes in and converts

the money back to U.S. dollars. The exchange rate in October 2005 was 6.23 kr/\$. To determine the return on the investment we can apply the rate of return formula derived in Chapter 4, [Section 4.3](#) and Chapter 4, [Section 4.4](#):

The rate of return works out to be negative, which means that instead of making money on the foreign deposit, this investor actually loses \$317. Had he deposited the \$10,000 in a U.S. account, he would have had a guaranteed return of 1.90 percent, earning him \$190 instead.

By depositing in a foreign account, the depositor subjected himself to exchange rate risk. The dollar unexpectedly appreciated during the year, resulting in a loss. Had the dollar remain fixed in value during that same time, the foreign return would have been 2.25 percent, which is larger than that obtained in the United States.

Thus fluctuating exchange rates make it more difficult for investors to know the best place to invest. One cannot merely look at what the interest rate is across countries but must also speculate about the exchange rate change. Make the wrong guess about the exchange rate movement and one could lose a substantial amount of money.

There are some ways to hedge against exchange rate risk. For example, with short-term deposits, an investor can purchase a forward contract or enter a futures market. In these cases, the investor would arrange to sell Danish krone in the future when the deposit is expected to be converted back to dollars. Since the future exchange rate is predetermined on such a contract, the rate of return is guaranteed as well. Thus the risk of floating exchange rates can be reduced. However, for long-term investment such as foreign direct investment, these types of arrangements are more difficult and costly to implement.

## Volatility and the Choice of Exchange Rate System

On the face of it, floating exchange rates would appear to be riskier than fixed rates since they are free to change regularly. For this reason, countries may choose fixed exchange rates to reduce volatility and thus to encourage international trade and investment.

The problem with this perception is that it has not worked out this way in practice. A 2004 International Monetary Fund (IMF) study Peter Clark, Natalia Tamirisa, and Shang-Jin Wei, “Exchange Rate Volatility and Trade Flows—Some New Evidence,” International Monetary Fund, May 2004[0], <http://www.imf.org/external/np/res/exrate/2004/eng/051904.pdf>, notes that on average, during the 1970s, 1980s, and 1990s, the volatility of fixed exchange rates was approximately the same as that of floating rates. There are two reasons this can occur. First, a currency fixed to another reserve currency will continue to float against other currencies. Thus when China pegged its currency to the U.S. dollar, it continued to float with the dollar vis-à-vis the euro. Second, it is common for fixed currencies to be devalued or revalued periodically, sometimes dramatically. When this happens, the effects of volatility are concentrated in a very short time frame and can have much larger economic impacts.

The second thing noted by this study is that volatility had only a small effect on bilateral international trade flows, suggesting that the choice of exchange rate system on trade flows may be insignificant. However, the study does not consider the effects of volatility on international investment decisions. Other studies do show a negative relationship between exchange rate volatility and foreign direct investment. But if these results were true and fixed exchange rates are just as volatile as floating rates, then there is no obvious exchange system “winner” in terms of the effects on volatility. Nevertheless, volatility of exchange rate systems remains something to worry about and consider in the choice of exchange rate systems.

### Key Takeaways

- Volatile exchange rates make international trade and investment decisions more difficult because volatility increases exchange rate risk.
- Volatile exchange rates can quickly and significantly change the expected rates of return on international investments.
- Volatile exchange rates can quickly and significantly change the profitability of importing and exporting.
- Despite the expectation that fixed exchange rates are less volatile, a 2004 IMF study notes that on average, during the 1970s, 1980s, and 1990s, the volatility of fixed exchange rates was approximately the same as that of floating rates.

### Exercises

1. **Jeopardy Questions.** As in the popular television game show, you are given an answer to a question and you must respond with the question. For example, if the answer is “a tax on imports,” then the correct question is “What is a tariff?”
  - This term describes the unpredictable movement of an exchange rate.
  - Of *increase*, *decrease*, or *no change*, the effect on an importer’s profits if he waits to exchange currency and the foreign currency rises in value vis-à-vis the domestic currency in the meantime.

- Of *increase, decrease, or no change*, the effect on an importer's profits if he waits to exchange currency and the domestic currency falls in value vis-à-vis the foreign currency in the meantime.
  - Of *increase, decrease, or no change*, the effect on an investor's rate of return on foreign assets if the foreign currency rises in value more than expected vis-à-vis the domestic currency after purchasing a foreign asset.
  - Of *increase, decrease, or no change*, the effect on an investor's rate of return on foreign assets if the foreign currency falls in value less than expected vis-à-vis the domestic currency after purchasing a foreign asset.
2. Between 2007 and 2008, the U.S. dollar depreciated significantly against the euro. Answer the following questions. Do not use graphs to explain. A one- or two-sentence verbal explanation is sufficient.
- Explain whether European businesses that compete against U.S. imports gain or lose because of the currency change.
  - Explain whether European businesses that export their products to the United States gain or lose because of the currency change.
  - Explain whether European investors who purchased U.S. assets one year ago gain or lose because of the currency change.

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