

16.6: Demand and Supply Shifts in Foreign Exchange Markets

Learning Objectives

- Explain the factors that cause the demand and supply of foreign currencies to shift
- Define arbitrage and the importance of purchasing power parity

Demand and Supply Shifts in Foreign Exchange Markets

The foreign exchange market involves firms, households, and investors who purchase foreign goods, services and assets (or who sell goods, services and assets to foreigners). As a result, they demand (or supply) foreign currencies in order to complete their transactions. For example, households buy imported goods for which they need foreign currency to pay for them. Similarly, wealthy individuals or businesses make investments in foreign countries for which they need foreign currency also.

Exchange rates are the prices of foreign currencies, which are determined in their respective foreign currency markets. A variety of factors can influence these exchange rates, including the amounts of imports and exports, GDP, market expectations, and inflation. For example, if the GDP falls in one nation, that nation is likely to import less. If GDP grows, it will import more. Everything else held constant, these fluctuations also cause a shift in foreign exchange markets. For example, if the U.S. goes into a recession, then GDP falls and they would import less from Mexico. Thus, the demand for Mexican pesos decreases and the U.S. dollar falls relative to the Mexican peso. In other words, the peso gains value.

Figure 1(a) offers an example for the exchange rate between the U.S. dollar and the Mexican peso. The vertical axis shows the exchange rate for U.S. dollars, which in this case is measured in pesos. The horizontal axis shows the quantity of U.S. dollars being traded in the foreign exchange market each day. The demand curve (D) for U.S. dollars intersects with the supply curve (S) of U.S. dollars at the equilibrium point (E), which is an exchange rate of 10 pesos per dollar and a total volume of \$8.5 billion.

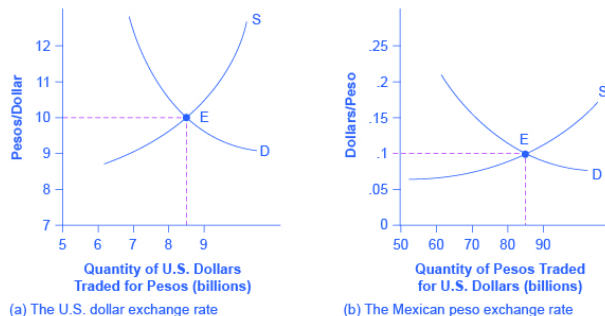


Figure 1. Demand and Supply for the U.S. Dollar and Mexican Peso Exchange Rate. (a) The quantity measured on the horizontal axis is in U.S. dollars, and the exchange rate on the vertical axis is the price of U.S. dollars measured in Mexican pesos. (b) The quantity measured on the horizontal axis is in Mexican pesos, while the price on the vertical axis is the price of pesos measured in U.S. dollars. In both graphs, the equilibrium exchange rate occurs at point E, at the intersection of the demand curve (D) and the supply curve (S).

Figure 1(b) presents the same demand and supply information from the perspective of the Mexican peso. The vertical axis shows the exchange rate for Mexican pesos, which is measured in U.S. dollars. The horizontal axis shows the quantity of Mexican pesos traded in the foreign exchange market. The demand curve (D) for Mexican pesos intersects with the supply curve (S) of Mexican pesos at the equilibrium point (E), which is an exchange rate of 10 cents in U.S. currency for each Mexican peso and a total volume of 85 billion pesos. Note that the two exchange rates are inverses: 10 pesos per dollar is the same as 10 cents per peso (or \$0.10 per peso). In the actual foreign exchange market, almost all of the trading for Mexican pesos is done for U.S. dollars. What factors would cause the demand or supply to shift, thus leading to a change in the equilibrium exchange rate? Read on to discover the answer to this question.

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Expectations about Future Exchange Rates

One reason to demand a currency on the foreign exchange market is the belief that the value of the currency is about to increase. One reason to supply a currency—that is, sell it on the foreign exchange market—is the expectation that the value of the currency is about to decline. For example, imagine that a leading business newspaper, like the *Wall Street Journal* or the *Financial Times*, runs an article predicting that the Mexican peso will appreciate in value. The likely effects of such an article are illustrated in the interactive graph below (Figure 2). Demand for the Mexican peso shifts to the right, from D_0 to D_1 , as investors become eager to purchase pesos. Conversely, the supply of pesos shifts to the left, from S_0 to S_1 , because investors will be less willing to give them up. The result is that the equilibrium exchange rate rises from 10 cents/peso to 12 cents/peso and the equilibrium exchange rate rises from 85 billion to 90 billion pesos as the equilibrium moves from E_0 to E_1 .

A link to an interactive elements can be found at the bottom of this page.

Figure 2 (Interactive Graph). Exchange Rate Market for Mexican Peso Reacts to Expectations about Future Exchange Rates.

Figure 2 also illustrates some peculiar traits of supply and demand diagrams in the foreign exchange market. In contrast to all the other cases of supply and demand you have considered, in the foreign exchange market, supply and demand typically both move at the same time. Groups of participants in the foreign exchange market like firms and investors include some who are buyers and some who are sellers. An expectation of a future shift in the exchange rate affects both buyers and sellers—that is, it affects both demand and supply for a currency.

The shifts in demand and supply curves both cause the exchange rate to shift in the same direction; in this example, they both make the peso exchange rate stronger. However, the shifts in demand and supply work in opposing directions on the quantity traded. In this example, the rising demand for pesos is causing the quantity to rise while the falling supply of pesos is causing quantity to fall. In this specific example, the result is a higher quantity. But in other cases, the result could be that quantity remains unchanged or declines.

This example also helps to explain why exchange rates often move quite substantially in a short period of a few weeks or months. When investors expect a country's currency to strengthen in the future, they buy the currency and cause it to appreciate immediately. The appreciation of the currency can lead other investors to believe that future appreciation is likely—and thus lead to even further appreciation. Similarly, a fear that a currency *might* weaken quickly leads to an *actual* weakening of the currency, which often reinforces the belief that the currency is going to weaken further. Thus, beliefs about the future path of exchange rates can be self-reinforcing, at least for a time, and a large share of the trading in foreign exchange markets involves dealers trying to outguess each other on what direction exchange rates will move next.

Differences across Countries in Rates of Return

The motivation for investment, whether domestic or foreign, is to earn a return. If rates of return in a country look relatively high, then that country will tend to attract funds from abroad. Conversely, if rates of return in a country look relatively low, then funds will tend to flee to other economies. Changes in the expected rate of return will shift demand and supply for a currency. For example, imagine that interest rates rise in the United States as compared with Mexico. Thus, financial investments in the United States promise a higher return than they previously did. As a result, more investors will demand U.S. dollars so that they can buy interest-bearing assets and fewer investors will be willing to supply U.S. dollars to foreign exchange markets. Demand for the U.S. dollar will shift to the right, from D_0 to D_1 , and supply will shift to the left, from S_0 to S_1 , as shown in the interactive graph below (Figure 3). The new equilibrium (E_1), will occur at an exchange rate of nine pesos/dollar and the same quantity of \$8.5 billion. Thus, a higher interest rate or rate of return relative to other countries leads a nation's currency to appreciate or strengthen, and a lower interest rate relative to other countries leads a nation's currency to depreciate or weaken. Since a nation's central bank can use monetary policy to affect its interest rates, a central bank can also cause changes in exchange rates.

An interactive or media element has been excluded from this version of the text. You can view it online here: <http://pb.libretexts.org/mlum/?p=671>

Figure 3 (Interactive Graph). Exchange Rate Market for U.S. Dollars Reacts to Higher Interest Rates.

Relative Inflation

If a country experiences a relatively high inflation rate compared with other economies, then the buying power of its currency is eroding, which will tend to discourage anyone from wanting to acquire or to hold the currency. Figure 4 (the interactive graph below) shows an example based on an actual episode concerning the Mexican peso. In 1986–87, Mexico experienced an inflation rate of over 200%. Not surprisingly, as inflation dramatically decreased the purchasing power of the peso in Mexico, the exchange rate value of the peso declined as well. As shown in Figure 4, demand for the peso on foreign exchange markets decreased from D_0 to D_1 , while supply of the peso increased from S_0 to S_1 . The equilibrium exchange rate fell from \$2.50 per peso at the original equilibrium (E_0) to \$0.50 per peso at the new equilibrium (E_1). In this example, the quantity of pesos traded on foreign exchange markets remained the same, even as the exchange rate shifted.

A link to an interactive elements can be found at the bottom of this page.

Figure 4 (Interactive Graph). Exchange Rate Markets React to Higher Inflation.

Purchasing Power Parity

Over the long term, exchange rates must bear some relationship to the buying power of the currency in terms of goods that are internationally traded. If at a certain exchange rate it was much cheaper to buy internationally traded goods—such as oil, steel, computers, and cars—in one country than in another country, businesses would start buying in the cheap country, selling in other countries, and pocketing the profits.

For example, if a U.S. dollar is worth \$1.60 in Canadian currency, then a car that sells for \$20,000 in the United States should sell for \$32,000 in Canada. If the price of cars in Canada was much lower than \$32,000, then at least some U.S. car-buyers would convert their U.S. dollars to Canadian dollars and buy their cars in Canada. If the price of cars was much higher than \$32,000 in this example, then at least some Canadian buyers would convert their Canadian dollars to U.S. dollars and go to the United States to purchase their cars. This is known as **arbitrage**, the process of buying and selling goods or currencies across international borders at a profit. It may occur slowly, but over time, it will force prices and exchange rates to align so that the price of internationally traded goods is similar in all countries.

The exchange rate that equalizes the prices of internationally traded goods across countries is called the **purchasing power parity (PPP)** exchange rate. A group of economists at the International Comparison Program, run by the World Bank, have calculated the PPP exchange rate for all countries, based on detailed studies of the prices and quantities of internationally tradable goods.

Watch It

In this video, Alex shows you an example of purchasing power parity while on a trip to India.

A link to an interactive elements can be found at the bottom of this page.

The purchasing power parity exchange rate has two functions. First, PPP exchange rates are often used for international comparison of GDP and other economic statistics. Imagine that you are preparing a table showing the size of GDP in many countries in several recent years, and for ease of comparison, you are converting all the values into U.S. dollars. When you insert the value for Japan, you need to use a yen/dollar exchange rate. But should you use the market exchange rate or the PPP exchange rate? Market exchange rates bounce around. In summer 2008, the exchange rate was 108 yen/dollar, but in late 2009 the U.S. dollar exchange rate versus the yen was 90 yen/dollar. For simplicity, say that Japan's GDP was ¥500 trillion in both 2008 and 2009. If you use the market exchange rates, then Japan's GDP will be \$4.6 trillion in 2008 (that is, ¥500 trillion / (¥108/dollar)) and \$5.5 trillion in 2009 (that is, ¥500 trillion / (¥90/dollar)).

Of course, it is not true that Japan's economy increased enormously in 2009—in fact, Japan had a recession like much of the rest of the world. The misleading appearance of a booming Japanese economy occurs only because we used the market exchange rate, which often has short-run rises and falls. However, PPP exchange rates stay fairly constant and change only modestly, if at all, from year to year.

The second function of PPP is that exchanges rates will often get closer and closer to it as time passes. It is true that in the short run and medium run, as exchange rates adjust to relative inflation rates, rates of return, and to expectations about how interest rates and inflation will shift, the exchange rates will often move away from the PPP exchange rate for a time. But, knowing the PPP will allow you to track and predict exchange rate relationships.

Food For Thought

One interesting way to think about purchasing power parity is by comparing the price of a hamburger across different countries. Initially just for fun, The Economist began comparing the price of a BigMac in the [BigMac Index](#) between various countries in 1986, and continues to do so today as a simple way to see how currency may be either undervalued or overvalued.

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Learning Objectives

[glossary-page][glossary-term]arbitrage: [/glossary-term]

[glossary-definition]the process of buying a good and selling goods across borders to take advantage of international price differences[/glossary-definition][glossary-term]purchasing power parity (PPP):[/glossary-term]

[glossary-definition]the exchange rate that equalizes the prices of internationally traded goods across countries[/glossary-definition] [/glossary-page]

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