

chapter 18 (34)

Open-Economy Macroeconomics

Chapter Objectives

Students will learn in this chapter:

- The meaning of the balance of payments accounts.
- The determinants of international capital flows.
- The role of the foreign exchange market and the exchange rate.
- The importance of real exchange rates and their role in the current account.
- The considerations that lead countries to choose different exchange rate regimes, such as fixed exchange rates and floating exchange rates.
- Why open-economy considerations affect macroeconomic policy under floating exchange rates.

Chapter Outline

Opening Example: In 2008, European tourists in the United States were spending lots of money, while U.S. tourists in Europe were cutting back. The relative value of the euro to the U.S. dollar significantly affected the spending decisions of the two groups.

I. Capital Flows and the Balance of Payments

A. Balance of Payments Accounts

1. *Definition:* A country's **balance of payments accounts** are a summary of the country's transactions with other countries.
2. *Definition:* A country's **balance of payments on current account**, or **current account**, is its balance of payments on goods and services plus net international transfer payments and factor income.
3. *Definition:* A country's **balance of payments on goods and services** is the difference between its exports and its imports during a given period.
4. *Definition:* The **merchandise trade balance**, or **trade balance**, is the difference between a country's exports and imports of goods.
5. *Definition:* A country's **balance of payments on financial account**, or simply its **financial account**, is the difference between its sales of assets to foreigners and its purchases of assets from foreigners during a given period.

6. A fundamental rule of balance of payments accounting for any country is:

$$\begin{aligned} &\text{Balance of payments on current account (CA) +} \\ &\text{Balance of payments on financial account (FA) = 0} \end{aligned}$$

Or,

$$CA = -FA$$

- B. International capital flows can be modeled using an international version of the loanable funds model, in which capital moves to equalize interest rates across countries.
- C. Differences across countries in the supply and demand for loanable funds are motivated by international differences in savings behavior and investment opportunities.

II. The Role of the Exchange Rate

A. Understanding Exchange Rates

1. *Definition:* Currencies are traded in the **foreign exchange market**.
2. *Definition:* The prices at which currencies trade are known as **exchange rates**.
3. *Definition:* When a currency becomes more valuable in terms of other currencies, it **appreciates**.
4. *Definition:* When a currency becomes less valuable in terms of other currencies, it **depreciates**.

B. The Equilibrium Exchange Rate

1. *Definition:* The **equilibrium exchange rate** is the exchange rate at which the quantity of a currency demanded in the foreign exchange market is equal to the quantity supplied.
2. An increase in demand for U.S. dollars, possibly due to a change in the preferences of foreign investors, will result in an appreciation of the U.S. dollar.
3. A decrease in demand for U.S. dollars, possibly due to a change in the preferences of foreign investors, will result in a depreciation of the U.S. dollar.
4. Any change in the U.S. balance of payments on financial accounts generates an equal and opposite reaction in the balance of payments on current account.
5. Movements in the exchange rate ensure that changes in financial account and in the current account offset each other.

C. Inflation and Real Exchange Rates

1. *Definition:* **Real exchange rates** are exchange rates adjusted for international differences in aggregate price levels.
2. The real exchange rate between two currencies, say the U.S. dollar and the Mexican peso, is calculated as follows:

$$\text{Real exchange rate} = \text{Mexican peso per U.S. dollar} \times \frac{P_{U.S.}}{P_{Mex}}$$

3. The current account responds only to changes in the real exchange rate, not the nominal exchange rate.

D. Purchasing Power Parity

1. *Definition:* The **purchasing power parity** between two countries' currencies is the nominal exchange rate at which a given basket of goods and services would cost the same amount in each country.
2. Over the long run, purchasing power parities are good at predicting actual changes in nominal exchange rates for countries at similar levels of economic development.

III. Exchange Rate Policy**A. Exchange Rate Regimes**

1. *Definition:* An **exchange rate regime** is a rule governing policy toward the exchange rate.
2. *Definition:* A country has a **fixed exchange rate** when the government keeps the exchange rate against some other currency at or near a particular target.
3. *Definition:* A country has a **floating exchange rate** when the government lets the exchange rate go wherever the market takes it.

B. How Can an Exchange Rate be Held Fixed?

1. *Definition:* Government purchases or sales of currency in the foreign exchange market are **exchange market intervention**.
2. *Definition:* **Foreign exchange reserves** are stocks of foreign currency that governments maintain to buy their own currency on the foreign exchange market.
3. *Definition:* **Foreign exchange controls** are licensing systems that limit the right of individuals to buy foreign currency.
4. Exchange rates can be fixed by using:
 - Exchange market intervention
 - Monetary policy designed to shift the supply and demand curves for a country's currency in the foreign exchange market
 - Foreign exchange controls

C. The Exchange Rate Dilemma

1. Fixed exchange rates facilitate transactions between buyers and sellers of goods in different countries by reducing the uncertainty associated with the future values of a nation's currency.
2. Fixed exchange rates commit a country to not engage in inflationary economic policies.
3. Fixed exchange rates require a country to hold large amounts of foreign currency in order to stabilize an exchange rate through intervention in currency markets.
4. Floating exchange rates leave monetary policy available for macroeconomic stabilization.
5. Floating exchange rates create uncertainty for businesses and consumers.

IV. Exchange Rates and Macroeconomic Policy**A. Devaluation and Revaluation of Fixed Exchange Rates**

1. *Definition:* A **devaluation** is a reduction in the value of a currency that is set under a fixed exchange rate regime.
2. A devaluation makes domestic goods cheaper in terms of foreign currency, which leads to higher exports. It also makes foreign goods more expensive in terms of domestic currency, which reduces imports.

3. *Definition:* A **revaluation** is an increase in the value of a currency that is set under a fixed exchange rate regime.
 4. A revaluation makes domestic goods more expensive in terms of foreign currency, which leads to lower exports. It also makes foreign goods less expensive in terms of domestic currency, which increases imports.
 5. Devaluations or revaluations can help reduce surpluses or shortages in the foreign exchange market and can increase or reduce aggregate demand, respectively.
- B. Monetary Policy Under Floating Exchange Rates**
1. Under a floating exchange rate, interest rates also affect the exchange rate.
 2. Under a floating exchange rate, monetary policy affects aggregate demand by impacting the exchange rate and thus affecting imports and exports.
- C.** Due to the fact that one country's imports are another country's exports, business cycles can be synchronized across countries. A fixed exchange rate regime intensifies the connection among different countries' business cycles, while a floating exchange rate reduces this link.

Teaching Tips

Capital Flows and the Balance of Payments

Creating Student Interest

When most students think of international economics, they think of the trading of goods and services among countries. Explain to students that financial assets also flow between countries. These international flows of assets are included in a country's balance of payments on financial account.

Presenting the Material

Carefully define all terms used in this section, in particular:

- Balance of payments
- Balance of payments on goods and services
- Merchandise trade balance, or trade balance
- Balance of payments on current account, or current account
- Balance of payments on financial account, or financial account

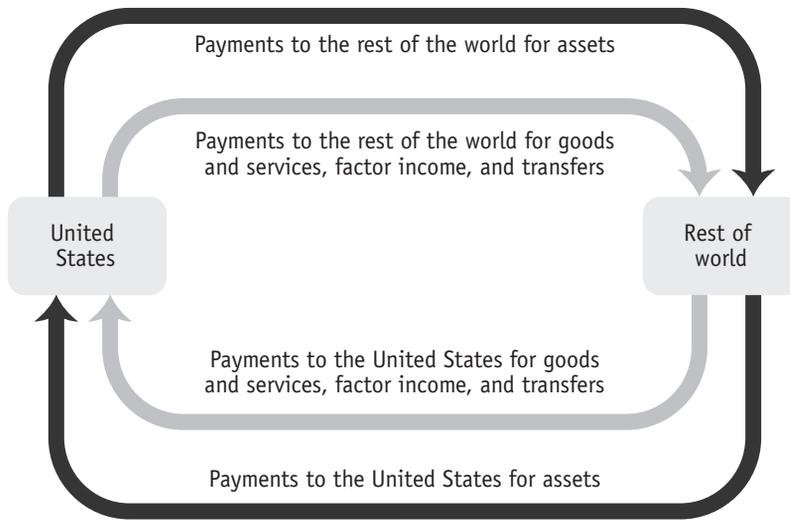
The relationships between the balance of payments on current account and balance of payments on financial account can be demonstrated using the mathematical equation:

$$\begin{aligned} &\text{Balance of payments on current account (CA) +} \\ &\text{Balance of payments on financial account (FA) = 0} \end{aligned}$$

Or,

$$CA = -FA$$

These relationships between the balance of payments on current account and balance of payments on financial account can also be demonstrated using a flow diagram, as shown in Figure 18-1 (Figure 34-1) in the text.



In addition, demonstrate how capital flows, which make up the balance of payment on financial account, can be modeled using an international version of the loanable funds model. Specifically, show the manner in which capital moves among countries to equalize interest rates across countries. Finally, discuss the factors that underlie the differences in countries' supply and demand for loanable funds.

The Role of the Exchange Rate

Creating Student Interest

Ask students if any of them have traveled outside of the United States. Afterward, ask students what currencies they used while outside of the United States. Also inquire as to how they knew how many units of the foreign currency they received per U.S. dollar. Explain that many exchange rates are determined in international currency markets, and change constantly while the foreign exchange markets are open to trading.

Presenting the Material

The concept of exchange rates can be explained through the use of a numerical example, such as the one shown in Table 18-3 (Table 34-3) in the text. It is important to demonstrate the manner in which an exchange rate can be expressed as, for example, the price of a dollar in terms of a foreign currency, and as the price of a foreign currency in terms of a dollar. Also discuss the notions of currency appreciation and depreciation, along with the effect of each on the relative prices of goods and services in different countries. Demonstrate the manner in which the equilibrium exchange rate is determined in the foreign exchange market. Also discuss the concept of real exchange rates and provide a numerical example to calculate a real exchange rate. Finally, discuss the topic of purchasing power parity.

Exchange Rates, September 13, 2008 3:45 P.M.

	U.S. dollars	Yen	Euros
One U.S. dollar exchanged for	1	107.94	0.7034
One yen exchanged for	0.009264	1	0.006516
One euro exchanged for	1.4217	153.46	1

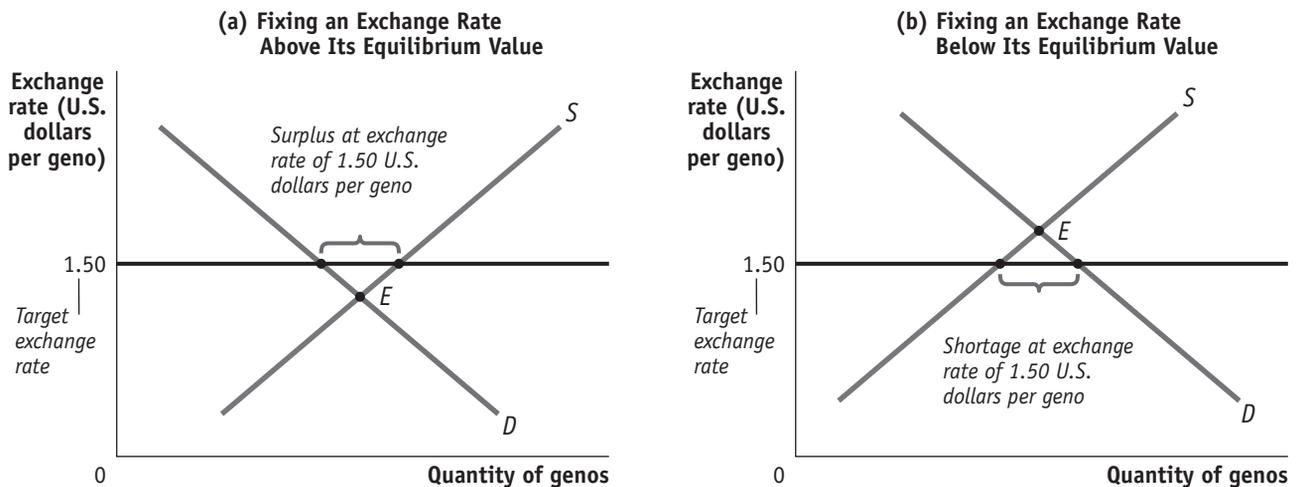
Exchange Rate Policy

Creating Student Interest

Begin this section by asking students if they know the difference between fixed and floating exchange rates. After listening to students' responses, provide formal definitions for both fixed and floating exchange rates. Follow up the original inquiry by asking whether the U.S. exchange rate is fixed or floating. Explain that the U.S. has had a floating exchange rate since 1971.

Presenting the Material

Begin this section by describing the various exchange rate regimes and provide an example of each. Use graphical analysis, such as that shown in panels (a) and (b) in Figure 18-10 (Figure 34-10) to demonstrate the process by which exchange rate intervention can fix an exchange rate. Also discuss the pros and cons of fixed and floating exchange rate regimes.



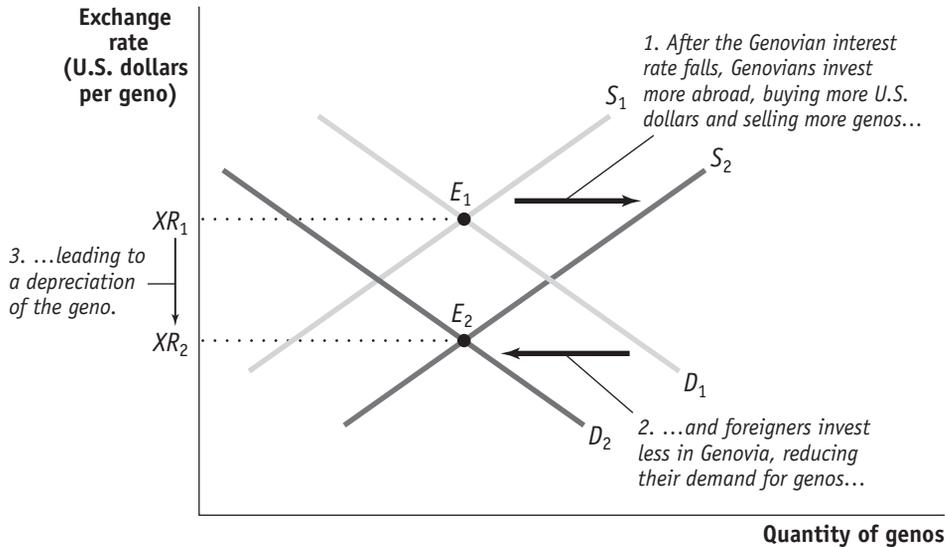
Exchange Rates and Macroeconomic Theory

Creating Student Interest

In this final section, students will see how they can apply some of the macroeconomic theory they have studied thus far to countries with either fixed or flexible exchange rates. Point out that the effect of, for example, monetary policy on the economy will be very different, depending on the type of exchange rate regime a country has adopted.

Presenting the Material

Begin by defining the key terms of *devaluation* and *revaluation* and explain why countries' under fixed exchange rates would choose to use either of these policies. Also discuss the effect of monetary policy under floating exchange rates and the manner in which it can affect the exchange rate, as shown in Figure 18-12 (Figure 34-12) in the text. Finally, explain the manner in which business cycles can become synchronized across countries due to the international flow of goods, services, and financial assets. Hence, major changes in aggregate demand in one country can affect the level of aggregate demand in other nations. This link is stronger when countries have fixed exchange rates as opposed to floating exchange rates.



Common Student Pitfalls

- **Which Way Is Up?** Make sure students understand the different ways that exchange rate statistics are published. The U.S. approach is different from that of most other countries. It is important to check before using exchange rate data—which way is the exchange rate being measured?
- **Depreciation versus appreciation.** It is common for students to make errors when assessing the effect of movements in international exchange rates on the prices of exports and imports. Explain, for example, that an appreciation in the U.S. dollar relative to some foreign currency will make goods imported to the United States cheaper, since each dollar now purchases more units of the foreign currency. However, an appreciation in the U.S. dollar will also cause U.S. exports to be more expensive, since each unit of foreign currency can now purchase fewer U.S. dollars.
- **The benefits of devaluation.** Students may not immediately understand the benefits associated with devaluation in a nation's currency. Why would a country want to have a currency that is worth less in terms of other countries' currencies? Explain to students that the major benefit to a country that devalues its currency is that this action makes its exports cheaper. Therefore, especially for a country that has a significant export sector, this move can ultimately help to increase its GDP.

Case Studies in the Text

Economics in Action

The Golden Age of Capital Flows—This EIA presents data on capital flows as a share of world savings and investment over time and explains that the “golden age of capital flows” was from 1870 to 1914.

Ask students the following questions:

1. What was the Golden Age of capital flows, and in what directions was capital flowing? (Answer: The Golden Age of capital flows occurred prior to World War I—from 1870 to 1914. The majority of the capital flows went from Great Britain to Australia, the United States, Canada, and Argentina.)

2. What factors facilitated the flow of capital during its Golden Age from 1870 to 1914? (Answer: The very limited restrictions on immigration in most countries allowed the free flow of many people from Europe to the United States, Canada, and Australia. European capital flowed to wherever its people immigrated. In addition, governments readily accepted the inflows of capital from abroad and did not perceive any risk in diminishing their national autonomy with this foreign capital.)

Low-Cost America—This EIA uses the example of the automotive industry in 2008 to explain the effect of a weak dollar on net exports.

Ask students the following questions:

1. Why did European automakers relocate in the United States leading up to 2008? (Answer: Incentives, exchange rates.)
2. What happened to real net exports of goods and services during this time? (Answer: They turned sharply upward.)
3. Why does a weak dollar have this effect on real net exports? (Answer: The weak dollar makes U.S. goods cheaper for buyers in other countries.)

China Pegs the Yuan—This EIA uses the example of China in the early twenty-first century to explain the implementation of a fixed exchange rate system.

Ask students the following questions:

1. Prior to July 21, 2005, when China had a fixed exchange rate tied to the value of the U.S. dollar, what actions did the Chinese government undertake to keep its exchange rate fixed? (Answer: The Chinese government had to engage in large-scale interventions in the currency markets by selling yuan and buying other countries' currencies to keep the exchange rate fixed at 8.28 yuan per U.S. dollar.)
2. How did the Chinese government recently change its exchange rate? (Answer: On July 21, 2005, the Chinese government agreed to fix the value of its currency in terms of a market basket of currencies, rather than tying the value of the yuan to just the value of the U.S. dollar.)

The Joy of a Devalued Pound—This EIA explains the benefits of Britain's move from a fixed exchange rate system to a floating system in the 1990s.

Ask students the following questions:

1. What were some of the benefits to the British economy when Britain moved from a fixed to a flexible exchange rate? (Answer: Immediately after Britain went off its fixed exchange rate, aggregate demand in Britain increased and helped to alleviate unemployment in the economy. The British government no longer had to actively engage in exchange market intervention in order to support the value of the British pound. It also could now use expansionary monetary policies as necessary to stimulate the British economy.)
2. What happened to the British economy after it went off of its fixed exchange rate regime? (Answer: After Britain switched from its fixed exchange rate to a flexible exchange rate, the unemployment rate in the British economy fell. This occurred even while the unemployment rate rose in its neighboring countries of France and Germany, both of which were on fixed exchange rates as a part of the euro regime.)

For Inquiring Minds

GDP, GNP, and the Current Account—This FIM explains the difference between GDP and GNP.

A Global Savings Glut?—This FIM discusses the arguments in an influential speech given by Ben Bernanke that a global savings glut was responsible for the U.S. current account deficit in 2005.

Burgernomics—This FIM presents the annual measure of purchasing power parity calculated using a McDonald’s Big Mac, created by The Economist.

From Bretton Woods to the Euro—This FIM gives an overview of the use of fixed versus floating exchange rate systems in Europe since Bretton Woods.

Global Comparison

Current Account Surpluses and Deficit—This Global Comparison presents current account balance data for six “big players” in the global economy.

Activities

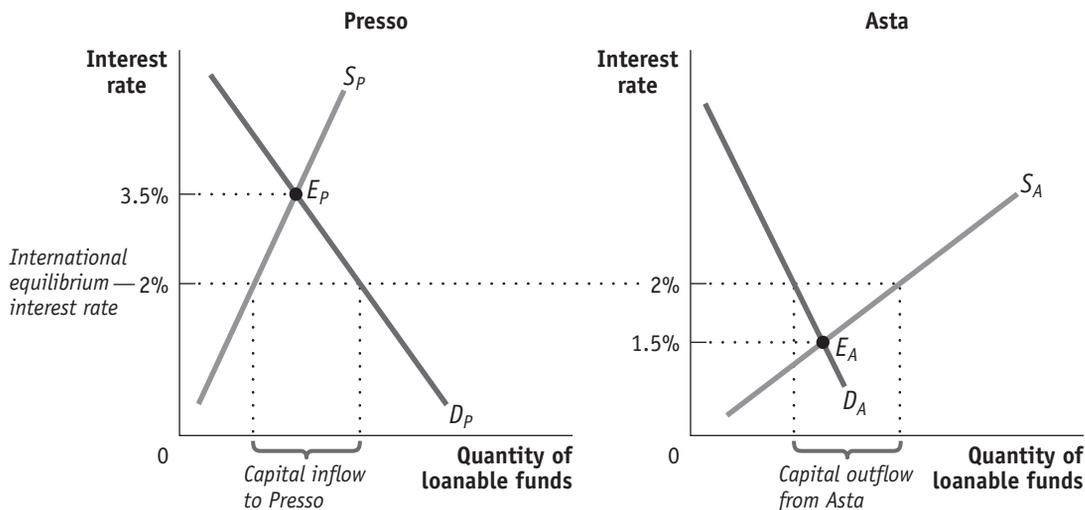
Understanding International Capital Flows (15 minutes)

Pair students and ask them to answer the following questions.

1. Economists observe substantial capital flows from the country of Asta to the country of Presso. Provide two possible reasons for this international flow of capital from Asta to Presso.
2. In the absence of international capital flows, assume that the equilibrium interest rate in the loanable funds market in Asta is 1.5%, while the equilibrium interest rate in the loanable funds market in Presso is 3.5%. Draw accurate graphs of the loanable funds market in Asta and Presso, and indicate the capital flows for each country that will lead to an international equilibrium interest rate of 2%.

Answers:

1. The flow of capital from Asta to Presso could be due to a higher interest rate in the loanable funds market in Presso than in Asta. It is possible that the higher interest rate in the loanable funds market in Presso is due to the fact that there is greater demand for loanable funds. It is also possible that the supply of loanable funds is lower in Presso than in Asta, which causes the interest rate to be higher in Presso.
- 2.



Working with Exchange Rates (25 minutes)

Pair students and ask them to complete the following exercises.

1. Using the following data on exchange rates on April 16, 2009, construct a table like Table 18-3 (Table 34-3) in the text.
 - One U.S. dollar exchanged for 99.3595 Japanese yen
 - One U.S. dollar exchanged for 0.7587 euros
 - One euro exchanged for 130.963 Japanese yen
2. Compare the results obtained in question 1 to the exchange rate given in Table 18-3 (Table 34-3) in the text. Did the U.S. dollar appreciate or depreciate relative to the euro? Did the U.S. dollar appreciate or depreciate relative to the Japanese yen?
3. Ask students to redo question 2 using current data on exchange rates obtained from the *Wall Street Journal*, or the *Economist*.

Answers:

1.

	U.S. Dollars	Japanese Yen	Euros
One U.S. dollar exchanged for	1	99.3595	0.7587
One Japanese yen exchanged for	0.0100	1	0.0076
One euro exchanged for	1.3182	130.763	1

2. A comparison of exchange rates reveals that the U.S. dollar depreciated relative to the Japanese yen and appreciated relative to the euro
3. Answers will vary.

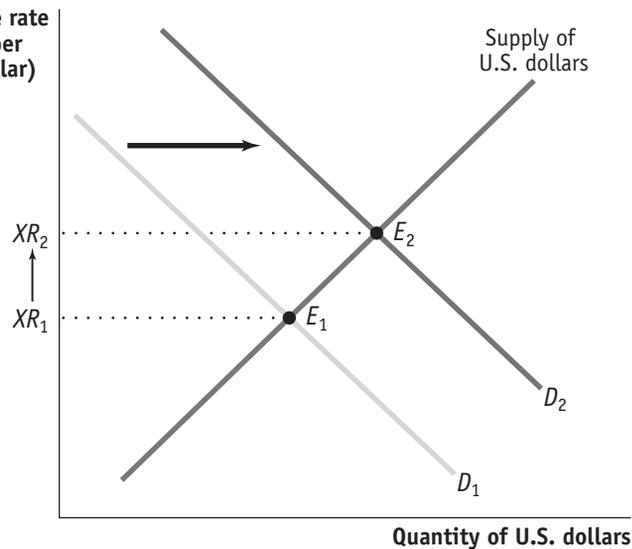
Factors Influencing Exchange Rates (15 minutes)

Pair students and ask them to complete the following exercises.

1. Graphically demonstrate the impact of an increase in capital flows from Japan to the United States on the demand for U.S. dollars and the equilibrium yen-per-dollar exchange rate.
2. Does the U.S. dollar appreciate or depreciate relative to the Japanese yen following an increase in capital flows from Japan to the U.S.?

Answers:

1. Exchange rate (yen per U.S. dollar)



Quantity of U.S. dollars

- Following an increase in capital flows from Japan to the United States, the U.S. dollar will appreciate and the yen-per-U.S. dollar exchange rate will increase.

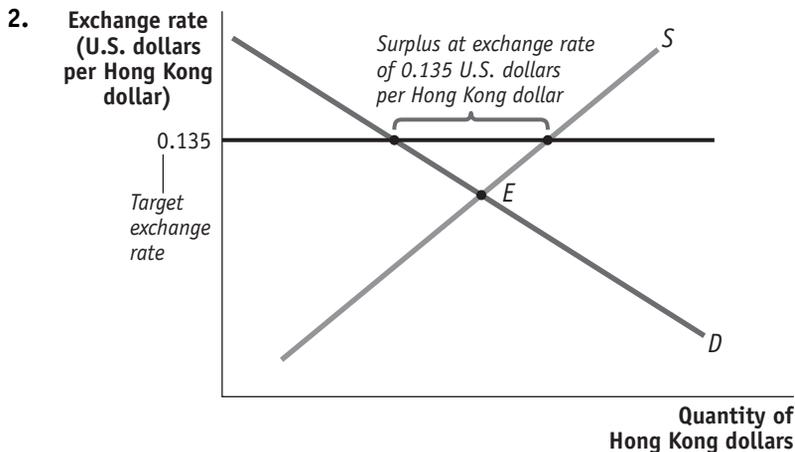
How Should the Government Intervene in Exchange Markets? (15 minutes)

Pair students and ask them to complete the following exercises.

- Hong Kong has a fixed exchange rate, where one Hong Kong dollar is fixed at 0.135 U.S. dollars. Describe three types of exchange market interventions that the Hong Kong government can use if the equilibrium exchange rate is less than the target exchange rate of 0.135 U.S. dollars per Hong Kong dollar.
- Draw a graph to illustrate the foreign exchange market for Hong Kong dollars when the equilibrium exchange rate is less than the target exchange rate of 0.135 U.S. dollars per Hong Kong dollar.

Answers:

- In order to maintain the target exchange rate, the government of Hong Kong can intervene in the foreign exchange market by buying Hong Kong dollars in the foreign exchange market. The Hong Kong government can also increase interest rates to increase demand for Hong Kong dollars. Finally, the Hong Kong government can decrease the supply of Hong Kong dollars to the foreign exchange market by (1) requiring domestic residents who want to buy foreign currency to get a license and (2) giving these licenses only to people engaging in approved transactions.



Usefulness of Devaluation and Revaluation of Fixed Exchange Rates (15 minutes)

Pair students and ask them to answer the following questions.

- Why would a country choose to invoke a devaluation its currency?
- Why would a country choose to invoke a revaluation its currency?

Answers:

- A country with a fixed exchange rate would choose to invoke a devaluation of its currency in order to eliminate a surplus of its currency in the foreign exchange market. In addition, a devaluation can be used to reduce or eliminate a recessionary gap, by increasing exports, reducing imports, and increasing aggregate demand.

2. A country with a fixed exchange rate would choose to invoke a revaluation of its currency in order to eliminate a shortage of its currency in the foreign exchange market. In addition, a revaluation can be used to reduce or eliminate an inflationary gap, by decreasing exports, increasing imports, and decreasing aggregate demand.

Let's Debate: Fixed versus Floating Exchange Rates (25 minutes)

Divide the class into two groups and select a spokesperson for each team. Charge one group with supporting a fixed exchange rate. Assign the other team with defending a floating exchange rate. Remind students to incorporate points regarding the effectiveness of monetary policy and the international transmission of recessions in their arguments. Leave sufficient time for both sides to present their arguments. Afterward, declare a winner of the debate.

Web Resources

The following websites provide data on balance of payments from the International Monetary Fund and the Bureau of Economic Analysis:

<http://www.imf.org/external/np/sta/bop/bop.htm>

<http://www.bea.gov/International/Index.htm>

The following web site provides data for current exchange rates and a currency converter:

<http://www.x-rates.com/>.

SOLUTIONS MANUAL

