CHAPTER 18. OPENNESS IN GOODS
AND FINANCIAL MARKETS

1. Openness in Goods Markets
Openness in goods markets means that domestic residents are able to buy foreign goods and sell domestic goods abroad. Goods sold to foreigners are called exports. Goods bought from foreigners are called imports. The difference between exports and imports is the trade balance. A negative trade balance is called a trade deficit, and a positive one a trade surplus. In the closed economy model developed earlier in the book, domestic residents made only one decision—how much to spend. In an open economy, domestic residents make two decisions—how much to spend and how much to spend on domestic (as opposed to foreign) goods. The latter decision depends on the real exchange rate, the relative price of foreign goods in terms of home goods.

The real exchange rate depends on the nominal exchange rate ($E$), the foreign price level ($P^*$), and the home price level ($P$). The nominal exchange rate is defined as the home currency price of foreign currency. So, for example, if the United States were the home country, and one dollar traded for 100 yen, the nominal exchange rate would be 0.01 dollars/yen. Given this definition, an increase in the exchange rate means that the home currency loses value (i.e., one unit of the foreign currency is worth more units of the home currency). A currency is said to depreciate when it loses value and to appreciate when it gains value. Thus, a depreciation (appreciation) of the home currency means an increase (decrease) in $E$.

Suppose Japan, the foreign country, produces only one good, cars. If a car were to sell for $P^*$ in Japan, its price in dollars would be $EP^*$. Note that $E$ is in units of dollars/yen and $P^*$ in units of yen per car, so $EP^*$ is in units of dollars/car. Now assume that the United States, the home country, also produces only one good, computer games. One could compare the dollar price $P$ of computer games produced in the United States to the dollar price of cars produced in Japan. This motivates the definition of the real exchange rate ($\varepsilon$):

$$\varepsilon = \frac{EP^*}{P}. \quad (18.1)$$

In this one-good-per-country example, the real exchange rate would have units of home goods per foreign good (in this case, computer games per car). The nominal exchange rate has units of home currency per foreign currency. Since in fact there are many goods, in practice the real exchange rate is defined over baskets of goods, and $P$ and $P^*$ refer to price indices. As such, the real exchange rate is also an index: its level is arbitrary (since one can choose any base year for the price indices), but its rate of change is well defined. In terms of price indices, the real exchange rate measures the price of a basket of goods in the foreign country in terms of baskets of goods in the home country. So, for example, if the real exchange rate is 2, the price of a foreign basket of goods is two home baskets of goods. Which basket depends upon which price index is used. If $P$ refers to the GDP deflator, as in the text, then the real exchange rate measures the price of goods produced in the foreign country in terms of goods produced in the home country.

An increase in the relative price of foreign goods is a real depreciation (an increase in $\varepsilon$). An increase in the relative price of home goods is a real appreciation (a decrease in $\varepsilon$). Since a country has many trading partners, the bilateral real exchange rate defined above is often replaced by a multilateral real exchange rate, which is a weighted average of the real exchange
rate against each of the country’s trading partners. The weights are the shares of total home country trade with each country.

2. Openness in Financial Markets

Openness in financial markets means that domestic residents are able to exchange assets (stocks, bonds, and money) with residents of other countries. There is link between trade in assets and trade in goods. Trade in assets allows countries to borrow from one another. Thus, countries that run trade deficits can finance them by borrowing from countries that run trade surpluses.1

The balance of payments summarizes the transactions of one country with the rest of the world. It has two components. The first, the current account, is the sum of the trade balance, net investment income received from abroad, and transfers. As such, the current account is a record of net income received from the rest of the world. The second component of the balance of payments, the capital account, measures the purchase and sale of foreign assets. The capital account is defined as the net decrease in foreign assets (i.e., the increase in home assets held by foreigners minus the increase in foreign assets held by home country residents). Apart from a statistical discrepancy, the current account and the capital account sum to zero by construction.

The intuition behind balance of payments accounting is simple. Think of a country as a single person. A country with a negative current account balance (a deficit) spends more than its income. To finance the deficit, it can either sell some of its existing assets to foreigners or borrow from foreigners (sell bonds to foreigners). By definition, these transactions have a positive sign in the capital account. Likewise, a country with a positive current account balance (a surplus) spends less than its income. It can dispose of the extra income by purchasing foreign assets or making loans to foreigners (buying foreign bonds). By definition, these transactions have a negative sign in the capital account.

The capital account measures a country’s aggregate financial transactions with the rest of the world. Individual investment decisions are governed by the relative returns on home and foreign assets. The text assumes that domestic residents do not use foreign currency to purchase goods. Thus, there is no transactions motive for domestic residents to hold foreign currency. In addition, the text continues to assume that stocks and bonds are perfect substitutes, so it limits attention to home and foreign bonds.

How does one choose between home and foreign bonds? Suppose a U.S. resident has a dollar to invest. Let $i$ be the interest rate on U.S. bonds and $i^*$ the interest rate on Japanese bonds. Consider the choice between U.S. and Japanese bonds.

Option 1: Buy U.S. bonds

The return on one dollar equals $1 + i$ dollars.

Option 2: Buy Japanese bonds.

i. Exchange one dollar for $1/E_t$ yen.
ii. Invest $1/E_t$ yen in Japanese bonds, with a return of $(1+i^*)/E_t$ yen
iii. Exchange $(1+i^*)/E_t$ yen for $(1+i^*)E_{t+1}/E_t$ dollars.

1 Strictly, countries that run current account deficits borrow from countries that run current account surpluses.
The return on one dollar equals \((1+i^*)E_{t+1}/E_t\) dollars.
The expected return on one dollar equals \((1+i^*)E_{t+1}^e/E_t\) dollars.

Note that to transfer the return from the second option into dollars, the investor must exchange
the return at the future period’s exchange rate \(E_{t+1}\), which is unknown at time \(t\). The investor’s
expectation of the future exchange rate is given by \(E_{t+1}^e\). If investors care only about expected
returns and not about risk, then they will choose the option with the higher expected return. If
both U.S. and Japanese bonds are to be held by the private sector, it must be that the expected
returns are the same under either option. In other words,

\[
I + i = (1 + i^*)E_{t+1}^e/E_t,
\]

which can be approximated by

\[
i = i^* + (E_{t+1}^e - E_t)/E_t. \tag{18.2}
\]

Equation (18.2) is called the uncovered interest parity condition. It is uncovered because an
investor in foreign bonds is not protected from exchange rate risk. If the actual value of the
exchange rate turns out to be lower than expected (i.e., the dollar is more valuable than
expected), the investment in Japanese bonds produces a smaller return than the investment in
U.S. bonds.

In words, equation (18.2) says that the home interest rate equals (approximately) the foreign
interest rate plus expected depreciation of the home currency. To make home assets attractive,
foreign investors must be compensated for any expected depreciation of the home currency.

CHAPTER 19. THE GOODS MARKET
IN AN OPEN ECONOMY

1. The IS Relation in an Open Economy

When the economy is open to trade in goods, it becomes important to distinguish the domestic
demand for goods, given by \(C+I+G\), from the demand for domestic goods, denoted by \(Z\) and
given by

\[
Z = C + I + G - \varepsilon Q + X. \tag{19.1}
\]

The domestic demand for goods is specified as in Chapter 5, i.e., \(C(Y-T) + I(Y,r) + G\). Real exports
\((X)\) and real imports \((Q)\), measured in units of the foreign good) are given by:

\[
X = X(Y^*, \varepsilon). \tag{19.2}
\]
\[ Q = Q(Y, \varepsilon). \]  

(19.3)

Exports increase when foreign income \((Y^*)\) increases, since foreigners have more to spend, and when there is a real depreciation (an increase in \(\varepsilon\)), since home goods become less expensive relative to foreign goods. Imports increase when home income increases, since home residents have more to spend, and when there is a real appreciation, since foreign goods become less expensive relative to home goods. Substituting equations (19.2) and (19.3) into the demand for domestic goods produces a new IS relation:

\[ Y = C(Y-T) + I(Y,r) + G - \varepsilon Q(Y, \varepsilon) + X(Y^*, \varepsilon). \]  

(19.4)

Note that real imports are multiplied by the real exchange rate to convert them into units of the home good.

Figure 19.1 displays graphically the effect of introducing net exports into the Keynesian cross model. The domestic demand for goods is denoted DD. To derive the demand for domestic goods, first shift the DD curve down by the value of imports \((\varepsilon Q)\). The new curve, denoted AA, is flatter than DD, because the value of imports increases with income. Now add exports to the AA curve to arrive at the demand for domestic goods \((ZZ)\). Note that exports are independent of income, so the vertical distance between ZZ and AA is constant and the two curves have the same slope. The gap between the curves DD and ZZ is by construction the trade balance (sometimes called net exports \((NX)\)), depicted in the lower panel in Figure 19.1. Since the value of imports increases with income, the trade balance decreases with income. Note that Figure 19.1 assumes that the real exchange rate is fixed.

2. Equilibrium Output and the Trade Balance

Equilibrium in the goods market requires that the demand for domestic goods equals the production of domestic goods, namely that \(Y = Z\). Since this chapter concentrates on the short run, it assumes that production responds one-for-one to changes in demand (without changes in price). Graphically, equilibrium is determined by the intersection of the ZZ curve and the 45\(^\circ\)-line (Figure 19.2). In general, equilibrium does not require balanced trade. Figure 19.2 depicts an equilibrium with a trade deficit.
3. Increases in Demand, Domestic or Foreign
When domestic demand increases (e.g., $G$ increases, $T$ decreases, or consumer confidence increases), the ZZ curve shifts up, so output increases and the trade surplus falls. When foreign demand ($Y^*$) increases, the ZZ and NX curves shift up by the same amount. Output and the trade surplus increase. The increase in imports that arises from the increase in home output does not entirely offset the positive effect on exports from the increase in foreign demand.

Note that increases in domestic demand have a smaller effect on output in the open economy than in the closed economy, because some of the increased income “leaks” out of the domestic economy through spending on imports. In other words, the multiplier is smaller in an open economy. A box in the text carries this analysis further and notes that smaller countries are likely to have larger marginal propensities to import out of income. As a result, fiscal policy will have a smaller effect on output in a smaller economy, but a greater effect on the trade balance.

The relationship between foreign and home output suggests that policy coordination can be important when industrial countries as a group are operating below normal levels of output. Governments typically do not like to run trade deficits, because deficits require borrowing from the rest of the world. In the absence of coordinated action, an expansionary policy by an individual country in the midst of a worldwide recession will likely generate a trade deficit (or at least worsen the trade balance), because the increase in income will increase imports. Coordinated expansions will tend to have less effect on trade balances in individual countries,
because imports will increase substantially throughout the world. On the other hand, coordinated expansions may be difficult to arrange. Countries that have budget deficits may be unwilling to consider expansionary fiscal policy. In addition, once an agreement has been negotiated, each country has an incentive to renege, thereby hoping to benefit from expansions abroad and to improve its trade balance.

Figure 19.2: Equilibrium Output and the Trade Balance ($NX$)

### 4. Depreciation, the Trade Balance, and Output

The trade balance ($NX$) is given by

$$NX = X(Y^*, \varepsilon) - \varepsilon Q(Y, \varepsilon).$$  \hspace{1cm} (19.5)

A real depreciation has two effects: a quantity effect (an increase in exports and a reduction in imports), which tends to increase the trade balance, and a price effect (an increase in the relative price of imports), which tends to reduce the trade balance. The net effect will be positive if the Marshall-Lerner condition (derived in an appendix) is satisfied. If so, a real depreciation will improve the trade balance and increase output. With some qualifications, the Marshall-Lerner condition is usually satisfied in practice, and the text assumes that a real depreciation will improve the trade balance.

If the government can affect the real exchange rate through policy, then it can use two policy instruments (fiscal policy and the real exchange rate) to achieve two policy targets (output and the trade balance). For example, suppose a country in recession had a trade deficit, and policymakers wished to achieve a specific, higher level of output and balanced trade.
Expansionary fiscal policy would increase output, but would also worsen the trade deficit. A real depreciation would increase output and improve the trade deficit, but there is no guarantee that it could achieve the output target under balanced trade. To achieve both targets, policymakers would need a policy mix. First, they would engineer a real depreciation sufficient to balance trade at the target output level. Then, they would use fiscal policy to ensure that the economy achieved the target output level. If output would be higher than desired after the real depreciation, policymakers would use contractionary fiscal policy; if output would be lower than desired, they would use expansionary fiscal policy. The text includes a table that summarizes other policy mixes under alternative initial conditions for output and the trade balance.

5. Looking at Dynamics: the J-Curve
The effects of a real depreciation have a dynamic dimension. The price effect happens immediately, but the quantity effects take time. As a result, the trade balance tends to worsen immediately after a real depreciation, but improve over time. In other words, it takes some time for the Marshall-Lerner condition to be satisfied. This adjustment process of the trade balance—a temporary fall followed by a gradual improvement—is called the J-curve. Econometric evidence suggests that in rich countries, the trade balance improves between six months and a year after a real depreciation.

6. Saving, Investment, and Trade Deficits
The national income identity (equation (19.1)) can be expressed as
\[
NX=Y-C-I-G=(S-I)+(T-G),
\]
where private saving \(S\) is given by \(S=Y-C-T\). The first equality in equation (19.6) illustrates that the trade balance equals income minus spending. The second equality of equation (19.6) illustrates that the trade balance is the excess of private savings over investment plus the government budget surplus. Ignoring the distinction between the current account and the trade balance, a trade surplus implies that a country is lending to the rest of the world. The funds for this lending are derived from the two sources on the RHS of equation (19.6).

Since saving and investment are endogenous, equation (19.6) can be a misleading guide for policy analysis. For example, one might conclude from (19.6) that a real depreciation has no effect on the trade balance, because the real exchange rate does not appear. In fact, a real depreciation affects saving and investment, because it affects output. If the Marshall-Lerner condition is satisfied, a real depreciation will increase saving more than it increases investment, and improve the trade balance.

CHAPTER 20. OUTPUT, THE INTEREST RATE, AND THE EXCHANGE RATE

1. Equilibrium in the Goods Market
Given that \(NX=X(Y,\varepsilon)-\varepsilon Q(Y,\varepsilon)\), the goods market equilibrium condition can be written
\[
Y=C(Y-T)+I(Y,r)+G+NX(Y,Y^*,\varepsilon).
\]
In the short run, assume that $P$ and $P^*$ are fixed and (for convenience) equal to one, so that $E = \varepsilon$. Since $P$ is fixed, assume that expected inflation is zero, so that $r = i$. Under these assumptions, goods market equilibrium can be rewritten as

$$Y = C(Y-T) + I(Y,i) + G + \text{NX}(Y,Y^*,E).$$

(20.1)

2. Equilibrium in Financial Markets

Foreign currency is assumed to have no transactions value for domestic residents, so the choice between domestic money and bonds can be summarized by the LM relation,

$$M = YL(i),$$

(20.2)

which was introduced in Chapter 4.

Under the assumptions of perfect asset substitutability (i.e., no risk premium) and perfect capital mobility, the choice between domestic and foreign bonds is captured by the uncovered interest parity condition:

$$i_t = i^* + \left(E_{t+1}^{e} - E_t\right)/E_t.$$

(20.3)

The chapter assumes that the expected future exchange rate is fixed at $E^0$. Under this assumption and dropping time subscripts, uncovered interest parity can be rewritten as

$$E = E^0/(1+i-i^*).$$

(20.4)

Given the expected exchange rate, when the home-foreign interest differential increases, home assets become more attractive and the home currency appreciates ($E$ falls). In fact, the home currency will continue to appreciate until the expected depreciation (given $E^0$) equals the interest differential, so that returns on home and foreign assets are equalized.


Substituting equation (20.3) into equation (20.1) gives the open economy IS relation:

$$Y = C(Y-T) + I(Y,i) + G + \text{NX}(Y,Y^*,E^0/(1+i-i^*)).$$

(20.5)

The LM relation is given by equation (20.2). Graphically, the IS curve slopes down in $Y-i$ space. An increase in the interest rate reduces investment, as in the closed economy, and in addition, causes the currency to appreciate, reducing net exports. Moreover, the position of the IS curve is affected by foreign output and the foreign interest rate.

4. The Effects of Policy in an Open Economy

The effects of an increase in government spending are depicted graphically in Figure 20.1. The left panel shows the IS-LM curves. The right panel plots the uncovered interest parity condition. An increase in government spending shifts the IS curve to the right. Output and the interest rate increase. Since the expected future exchange rate is fixed, uncovered interest parity (equation (20.4)) implies that the exchange rate appreciates ($E$ falls). The increase in output and the appreciation of the exchange rate both work to reduce the trade balance. The effect on
investment is ambiguous, because the output effect tends to increase investment, but the interest rate effect tends to reduce it.

Figure 20.1: Expansionary Fiscal Policy in an Open Economy with Floating Exchange Rates

A decrease in the money supply shifts the LM curve to the left. Output falls, the interest rate increases, and the exchange rate appreciates. Investment definitely falls, but the effect on the trade balance is ambiguous, because the fall in output tends to increase it, but the exchange rate appreciation tends to reduce it.

5. Fixed Exchange Rates
If policymakers fix the exchange rate (credibly) at $E$, then expected depreciation is zero, and $i=i^*$ by uncovered interest parity. As a result, the IS and LM relations become

$$Y=C(Y-T)+I(Y,i^*)+G+NX(Y,Y^*, E)$$

$$M=YL(i^*).$$

Given fiscal policy, foreign output, and the foreign interest rate, output is fully determined by the fixed exchange rate and the IS curve. As a result, monetary policy is endogenous (i.e., policymakers lose control over the money supply). Given $Y, M$ must adjust to maintain $i^*$, in order to maintain the fixed exchange rate. If $i$ ever strays from $i^*$, uncovered interest parity implies that the exchange rate will be expected to appreciate or depreciate. This is inconsistent with a fixed exchange rate.

Although policymakers lose control over monetary policy under fixed exchange rates, they retain control over fiscal policy. In fact, the effect of fiscal policy on output is magnified, relative to the case of flexible exchange rates. An increase in $G$ would ordinarily lead to an increase in $i$. 
Under a fixed exchange rate, this is impossible. To maintain the fixed exchange rate, which requires \( i = i^* \), the money supply must increase. As a result, an increase in \( G \) leads to an increase in the money supply as well. So the effect of fiscal policy on output is augmented by endogenous changes in the money supply.

**CHAPTER 21. EXCHANGE RATE REGIMES**

1. **Fixed Exchange Rates and the Adjustment of the Real Exchange Rate**

   Suppose a country operates under a fixed exchange rate, \( E \). Perfect capital mobility implies that the home nominal interest rate equals the world nominal interest rate, i.e., \( i = i^* \). These assumptions imply that goods market equilibrium can be expressed as follows:

   \[
   Y = C(Y-T) + I(Y, i-e) + G + NX(Y, Y^*, E P*/P).
   \]  

   (21.1)

   To simplify, take expected inflation and foreign output as fixed. Then, equation (21.1) can be written as

   \[
   Y_t = Y(EP*/P_t, G, T).
   \]  

   (21.2)

   This chapter focuses on the role of the real exchange rate \( EP*/P \) in equation (21.2). A real depreciation (an increase in the real exchange rate) increases output by increasing net exports. An increase in \( G \) would also increase output; an increase in \( T \) would reduce output.

   Equation (21.2) specifies aggregate demand (AD). The time subscripts indicate that the home price level and home output can change over time. For convenience, the text assumes that \( G, T, \) and \( P^* \) are constant.

   Aggregate supply (AS) is given by the same relationship derived previously, namely

   \[
   P_t = P_{t-1}(1+\mu)F(1-Y_t/L, z).
   \]  

   (21.3)

   Equation (21.3) incorporates the assumption that the expected price level equals the price level in the previous period.

   The AS and AD curves are depicted in Figure 21.1. Note that the AD curve slopes down in output-price space, as in a closed economy, but for a different reason. In a closed economy, an increase in the price level tends to reduce the real money supply and, thus, to increase the interest rate and reduce output. In an open economy with fixed exchange rates, the interest rate is fixed at the world rate, but an increase in the price level causes a real appreciation, which tends to reduce net exports and output.

   Now suppose that the economy starts from a position in which output is below its natural level \( (Y_n) \) and unemployment is above the natural rate. This scenario is depicted in Figure 21.1. If policymakers maintain a commitment to the fixed exchange rate, the relatively high
The unemployment rate will tend to drive down wages, prices, and expected prices, and to shift the AS curve right until it intersects the AD curve at the natural level of output. Note that the increase in output along the AD curve results from the real depreciation created by the fall in the home price level. Although eventually the economy returns to the natural level of output, the process takes some time: output adjustment is limited by the speed of price adjustment.

Figure 21.1: AD and AS in an Open Economy with a Fixed Exchange Rate

If policymakers wanted to speed up adjustment, they could devalue the currency (increase the level of $E$). A devaluation would create a real depreciation in the short run and shift the IS curve to the right. In principle, a devaluation of the right size could return the economy to its natural level of output almost immediately. In practice, however, the immediate effect of a devaluation will be to increase the price of imported goods, which has two implications. First, it will take time for a devaluation to improve the trade balance (the J-curve effect), and second, devaluation will lead to an immediate increase in the cost of living (since some goods are imported), which will tend to increase wages and slow down price adjustment. These effects suggest that devaluation will not eliminate adjustment and that it may be difficult to determine the size of the devaluation required to restore output to its natural level.

2. Exchange Rate Crises under Fixed Exchange Rates
The analysis in Section 21.1 assumed that international investors believed that policymakers would maintain a fixed exchange rate of $E$. In fact, as was demonstrated in Section 21.1, policymakers have the option of devaluing the currency or, in the extreme, abandoning fixed exchange rates altogether. If international investors believe a devaluation is possible, the expected future exchange rate will rise above the current exchange rate, and by uncovered interest parity, the home interest rate will rise above the world rate by the amount of the expected devaluation (in percentage terms). Thus, in the face of an expected devaluation, policymakers will be required to raise the interest rate if they wish to maintain the fixed exchange rate. Since
raising the interest rate reduces home output and increases home unemployment, policymakers may find this course too painful and may abandon the current fixed rate, either through a devaluation (which validates the original expectation) or by adopting a flexible exchange rate regime.

At times, international investors may have good reason to fear devaluation or abandonment of fixed exchange rates. A country’s currency may be overvalued, implying that a real depreciation is necessary to improve output, the trade balance, or both. The quickest way to achieve a real depreciation is through a nominal depreciation. Likewise, a country may want to reduce its interest rate to get out of a recession. Fixed exchange rates preclude this option, but flexible exchange rates permit it through monetary expansion and concomitant nominal depreciation. The analysis above suggests, however, that an expected devaluation can trigger a crisis even if the initial fears of devaluation were groundless. In other words, there may be a self-fulfilling element to currency crises.

3. Exchange Rate Movements under Flexible Exchange Rates

Chapter 20 assumed that the expected exchange rate next period was fixed. This assumption generated a simple relationship between the interest rate and the exchange rate: the lower the interest rate, the more depreciated the exchange rate. In fact, the expected future exchange rate is not fixed, but can vary, with implications for the current exchange rate.

Rewrite the uncovered interest parity condition as follows:

\[ E_t = E^{e}_{t+1} \frac{(1+i^{*}_{t})}{(1+i_{t})} \]  
(21.4)

Applying equation (21.4) to time \( t+1 \) implies that the exchange rate at time \( t+1 \) will depend on the foreign and home interest rates at time \( t+1 \) and the expected exchange rate at time \( t+2 \). Thus, the expected exchange rate at time \( t+1 \) will depend on expected interest rates at time \( t+1 \) as well as the expected exchange rate at time \( t+2 \). In other words,

\[ E^{e}_{t+1} = E^{e}_{t+2} \frac{(1+i^{*}_{t+1})}{(1+i_{t+1})} \]  
(21.5)

Substituting equation (21.5) into equation (21.4) gives

\[ E_t = E^{e}_{t+2} \frac{(1+i^{*}_{t})(1+i^{*e}_{t+1})}{(1+i_{t})(1+i^{e}_{t+1})} \]  
(21.6)

Carrying this calculation \( n \) years into the future gives

\[ E_t = E^{e}_{t+n} \frac{(1+i^{*}_{t})(1+i^{*e}_{t+1})...(1+i^{*e}_{t+n})}{(1+i_{t})(1+i^{e}_{t+1})...(1+i^{e}_{t+n})} \]  
(21.7)

Equation (21.7) makes clear that the current exchange rate depends on expected interest rates and the expected exchange rate far into the future. In particular, there are three implications.

First, the current exchange rate will be affected by any factor that affects the future expected exchange rate. Over a long enough horizon, it is reasonable to assume that the exchange rate will have to be consistent with current account balance, since countries cannot borrow—and will not want to lend—forever. Thus, economic news that affects forecasts of the current account
balance may affect the future expected exchange rate, which in turn will affect the current exchange rate.

Second, the current exchange rate will be affected by any factor that affects current or expected future domestic or foreign interest rates.

Third, as a result of the first two implications, the relationship between the home interest rate and the exchange rate is not straightforward. Suppose the home central bank cuts the domestic interest rate. Financial market participants will make some judgement about whether the cut is temporary or signals the start of a series of interest rate cuts, and will then revise their expectations about future domestic interest rates accordingly. They will also assess the likely response of foreign central banks and revise their expectations of future foreign interest rates. These changes in expectations will affect the current exchange rate.

The bottom line is that exchange rates can fluctuate greatly even in the absence of large changes in current economic variables. As a result, countries that operate under fixed exchange rates must be prepared to accept substantial exchange rate fluctuations.

4. Choosing Between Exchange Rate Regimes
Countries that operate under fixed exchange rates with one another are constrained to have the same interest rates. Therefore, fixed exchange rates eliminate discretionary monetary policy and nominal depreciation as methods of adjustment during recession. In normal times, adjustment happens slowly—through price adjustment and changes in the real exchange rate over the medium run. In emergency situations, adjustment happens through devaluation, often forced on policymakers through currency crisis. Thus, the adjustment mechanism of fixed exchange rates does not appear terribly attractive.

On the other hand, as Robert Mundell pointed out in the 1960s, the loss of discretionary monetary policy is less important to the extent that countries operating under fixed exchange rates face one of two conditions: similar economic shocks or high factor mobility with one another. If countries face similar shocks, they would tend to choose the same monetary policies even in the absence of fixed exchange rates. If countries have high factor mobility, movements of workers can substitute for real depreciation as a method of economic adjustment. In other words, workers will move from areas that require real depreciation to avoid high unemployment. A group of countries that satisfy one of Mundell’s conditions is said to constitute an optimum currency area. As the name implies, it would make sense economically for such a group of countries to adopt a single currency. As the text argues, many economists believe that the countries of the Euro zone do not constitute an optimum currency area, since they satisfy neither of Mundell’s conditions.

In some cases, the loss of policymaking flexibility under fixed exchange rates may also provide benefits. If countries have a reputation for undisciplined monetary policy, international investors may fear that a floating exchange rate system will allow too much latitude for inflationary policy. To the extent that such countries can commit to a fixed rate system, they eliminate the potential for discretionary monetary policy. Since a fixed exchange rate can always be abandoned, however, it is not always a simple matter to demonstrate commitment to a fixed rate system. One method is to enter into a common currency with a set of other countries, as much of Europe has done. Another is to supplement fixed exchange rates with legislative or technical measures that limit or prohibit discretionary monetary policymaking. The latter arrangements—called
currency boards—generated much interest in the 1990s. Argentina adopted a currency board in 1991, but abandoned it in crisis in 2001. Some economists argue that Argentina's currency board was not tight enough, since an exchange rate crisis was not prevented. These economists argue that a country that wants a fixed exchange rate should simply adopt the U.S. dollar as its currency. Other economists argue that fixed exchange rates are a bad idea, and currency boards should be used for only short periods of time, if at all. A box in the text describes Argentina's crisis.

Finally, the policy flexibility seemingly offered by floating exchange rates may be illusory. In practice, floating exchange rates vary greatly. Large and unpredictable movements in the nominal exchange rate make life more complicated for firms and consumers and have real effects in the short run since prices (and hence the real exchange rate) adjust slowly. As described above, movements in the exchange rate are driven by expectations, which are not well understood, and the relationship between monetary policy and the nominal exchange rate is a bit more complicated than it seemed in Chapter 20. Moreover, to the extent that changes in the nominal exchange rate have real effects, monetary policymakers may be required to use policy to respond to unpredictable (and sometimes difficult to understand) movements in the nominal exchange rate. Thus, floating exchange rates do not allow policymakers complete independence; to some extent, policymakers are at the mercy of the foreign exchange market.

With this in mind, the choice of exchange rate regime requires weighing the potentially poor adjustment properties of fixed exchange rates against the costs of highly variable nominal exchange rates. The choice will depend on circumstances in each country—in particular, whether it is part of a group of countries that satisfy one of Mundell’s two conditions and whether it needs to establish a reputation for monetary discipline.