chapter

20

Flexible versus Fixed Exchange Rates, the European Monetary System, and Macroeconomic Policy Coordination

LEARNING GOALS:

After reading this chapter, you should be able to:

- Identify the advantages and disadvantages of flexible and fixed exchange rates
- Understand the meaning of an optimum currency area
- Describe the creation of the euro and the operation of the European Central Bank
- Describe the operation of a currency board and how it works in the nations that adopted it
- Describe adjustable pegs, crawling pegs, and managed floating and how they work
- Know the meaning and importance of macroeconomic policy coordination

20.1 Introduction

In Chapters 16 through 19, we examined separately the process of adjustment to balance-of-payments disequilibria under a flexible and under a fixed exchange rate system. In this chapter, we evaluate and compare the advantages and disadvantages of a flexible as opposed to a fixed exchange rate system, as well as the merits and drawbacks of hybrid systems that combine various characteristics of flexible and fixed exchange rates.

In general, advocates of flexible exchange rates argue that such a system is more efficient than a system of fixed exchange rates to correct balance-of-payments disequilibria. Furthermore, they stress that by allowing a nation to achieve external balance easily and automatically, flexible rates facilitate the achievement of internal balance and other economic objectives of the nation. On the other hand, advocates of fixed exchange rates argue that by introducing a degree of uncertainty not present under fixed rates, flexible exchange rates reduce the volume of

international trade and investment, are more likely to lead to destabilizing speculation, and are inflationary.

A careful review of the theoretical arguments raised by each side does not lead to any clear-cut conclusion that one system is overwhelmingly superior to the other. To be sure, at the time of the collapse of the fixed exchange rate system in the early 1970s, the majority of economists seemed to lean toward flexible exchange rates. However, as a result of the great volatility in exchange rates experienced over the past four decades, the balance today seems to be toward fixed or more managed rates. It seems that economists often compare the painfully obvious weaknesses of whatever the prevailing exchange rate system is to an idealized alternative system. This is contrasted to the more or less consistent preference of businesspeople, bankers, and government officials for fixed rates, or at least greatly restrained fluctuations.

No one can deny the important benefits of having a single currency throughout a nation and thus *permanently* fixed exchange rates between the various areas of the nation. (For example, a dollar in New York can be exchanged for a dollar in San Francisco or in any other part of the United States.) But then the debate over fixed versus flexible exchange rates becomes essentially a debate over what is an *optimum currency area*, or how large the area covered by permanently fixed exchange rates can be before the benefits of fixed rates are overcome by their drawbacks. In the final analysis, whether flexible or fixed exchange rates are better may very well depend on the nation or region involved and the conditions under which it operates.

In Section 20.2, we examine the case for flexible exchange rates, and in Section 20.3, the case for fixed exchange rates. Section 20.4 presents the closely related theory of optimum currency areas and discusses the European Monetary System. Section 20.5 looks at currency board arrangements and dollarization, while Section 20.6 examines the advantages and disadvantages of hybrid systems that combine some of the characteristics of flexible and fixed exchange rates in various degrees. These include systems with different exchange rate bands of fluctuation about a par value or a fixed exchange rate system characterized by adjustable pegs, crawling pegs, and managed floating. Finally, Section 20.7 deals with international macroeconomic policy coordination. The appendix presents the exchange rate arrangements of all IMF member countries.

20.2 The Case for Flexible Exchange Rates

We saw in Chapter 16 that under a truly flexible exchange rate system, a deficit or surplus in the nation's balance of payments is automatically corrected by a depreciation or an appreciation of the nation's currency, respectively, without any government intervention and loss or accumulation of international reserves by the nation. On the other hand, pegging or fixing the exchange rate at one level, just as fixing by law the price of any commodity, usually results in excess demand for or excess supply of foreign exchange (i.e., a deficit or a surplus in the nation's balance of payments), which can only be corrected by a change in economic variables other than the exchange rate. This is inefficient, may lead to policy mistakes, and requires the use of policies (such as monetary policy) that, therefore, are not available to achieve purely internal economic objectives.

20.2A Market Efficiency

Under a flexible exchange rate system, only the exchange rate needs to change to correct a disequilibrium in a nation's balance of payments. Balance-of-payments equilibrium would also be achieved under a fixed exchange rate system (such as the price-specie-flow mechanism under the gold standard) if all internal prices were perfectly flexible in the nation. However, it is argued that it is more efficient or less costly to change only one price (i.e., the exchange rate) than to rely on all internal prices changing in order to bring about adjustment in the balance of payments. The reasoning is the same as that for changing to daylight saving time during the summer months rather than rescheduling all events for one hour earlier. Furthermore, internal prices are sticky and far from perfectly flexible in today's world, especially downward.

According to its advocates, a flexible exchange rate system corrects balance-of-payments disequilibria smoothly and continuously as they occur. This results in stabilizing speculation, which dampens fluctuations in exchange rates. Whatever fluctuations remain in exchange rates can then be hedged at a small cost. On the other hand, the inability or unwillingness of a nation to adjust the exchange rate when out of equilibrium under a fixed exchange rate system is likely to give rise to destabilizing speculation and eventually force the nation to make a large discrete change in its exchange rate. This jolts the economy, imposes serious adjustment costs on the nation, and interferes with the smooth flow of international trade and investments.

Flexible exchange rates clearly identify the degree of comparative advantage and disadvantage of the nation in various commodities when these equilibrium exchange rates are translated into domestic prices. On the other hand, fixed exchange rates are often out of equilibrium in the real world, and when this is the case, they distort the pattern of trade and prevent the most efficient allocation of resources throughout the world.

For example, an exchange rate that is too high may lead the nation to export more of a commodity than would be justified at the equilibrium exchange rate. In extreme cases, it may even lead the nation to export a commodity in which, in reality, the nation has comparative *disadvantage*. That is, the commodity may be cheaper in relation to competitive foreign commodities (when expressed in terms of the same currency) at the nation's undervalued exchange rate even though it would be more expensive at the equilibrium exchange rate. This interferes with the most efficient utilization of world resources and reduces the benefits from international specialization in production and trade.

20.2B Policy Advantages

A flexible exchange rate system also means that the nation need not concern itself with its external balance and is free to utilize all policies at its disposal to achieve its purely domestic goals of full employment with price stability, growth, an equitable distribution of income, and so on. For example, we saw in Chapters 18 and 19 that under a fixed exchange rate system, the nation could use fiscal policy to achieve internal balance and monetary policy to achieve external balance. Other things being equal, the achievement of internal balance would certainly be facilitated if monetary policy were also free to be used alongside fiscal policy to attain this goal, or monetary policy could be utilized to achieve other purely internal

objectives, such as growth. In view of the limited number of effective policy instruments usually available to nations, this is no small benefit. In addition, the possibility of policy mistakes and delays in achieving external balance would also be minimized under a flexible exchange rate system.

An additional standard argument for flexible exchange rates is that they enhance the effectiveness of monetary policy (in addition to freeing it to be used for domestic objectives). For example, an anti-inflationary policy that improves the trade balance will result in an appreciation of the domestic currency. This further reduces domestic inflationary pressures by encouraging imports and discouraging exports.

Different nations also have different trade-offs between inflation and unemployment. For example, the United Kingdom and Italy seemed to tolerate double-digit inflation more readily than the United States to keep their unemployment rates low during the 1970s. Japan also seemed more willing than Germany to tolerate inflation to keep its unemployment rate very low. Flexible exchange rates allow each nation to pursue domestic policies aimed at reaching its own desired inflation–unemployment trade-off. Under fixed exchange rates, different inflationary rates in different nations result in balance-of-payments pressures (deficit in the more inflationary nations and surplus in the less inflationary nations), which restrain or prevent each nation from achieving its optimum inflation–unemployment trade-off. However, the benefit from flexible exchange rates along these lines may be only temporary.

Flexible exchange rates would also prevent the government from setting the exchange rate at a level other than equilibrium in order to benefit one sector of the economy at the expense of another or to achieve some economic objective that could be reached by less costly means. For example, developing nations usually maintain an exchange rate that is too low in order to encourage the importation of capital equipment needed for development. However, this discourages exports of agricultural and traditional commodities. The government then uses a maze of exchange and trade controls to eliminate the excess demand for foreign exchange resulting at its lower-than-equilibrium exchange rate. Other things being equal, it would be more efficient to allow the exchange rate to find its own equilibrium level and give a subsidy to the nation's industrial producers. This is generally better because a subsidy is more transparent and comes under legislative scrutiny, and because trade and exchange controls introduce many distortions and inefficiencies into the economy. As indicated in Section 11.5C, many developing nations moved in this direction during the 1990s.

Finally, a flexible exchange rate system does not impose the cost of government interventions in the foreign exchange market required to maintain fixed exchange rates. Flexible exchange rates are generally preferred by those, such as Nobel laureate Milton Friedman, who advocate a minimum of government intervention in the economy and a maximum of personal freedom.

The above represents the strongest possible case that could be made for flexible exchange rates, and while generally correct in its broad outlines, it needs to be greatly qualified. This is undertaken in the next two sections in the context of making a case for fixed exchange rates and in examining the theory of optimum currency areas. Also to be pointed out is that we are here examining the case for a freely floating exchange rate system in which there is no government intervention at all in foreign exchange markets. A system that permits even a minimum of government intervention in foreign exchange markets simply to smooth out excessive short-run fluctuations without affecting long-run trends or trying to support any specific set of exchange rates does not qualify as a truly flexible exchange rate system. This is referred to as a managed floating exchange rate system and will be examined in Section 20.6D.

20.3 The Case for Fixed Exchange Rates

In this section, we consider the case for fixed exchange rates. This rests on the alleged smaller degree of uncertainty that fixed exchange rates introduce into international trade and finance, on fixed exchange rates being more likely to lead to stabilizing rather than to destabilizing speculation, and on the greater price discipline (i.e., less inflation) than under flexible rates. Each of these arguments in favor of fixed exchange rates is presented together with the reply by advocates of flexible exchange rates as well as whatever empirical evidence is available on the issue.

20.3A Less Uncertainty

According to its advocates, a fixed exchange rate system avoids the wild day-to-day fluctuations that are likely to occur under flexible rates and that discourage specialization in production and the flow of international trade and investments. That is, with flexible exchange rates, the day-to-day shifts in a nation's demand for and supply of foreign exchange would lead to very frequent changes in exchange rates. Furthermore, because the demand and supply curves of foreign exchange are supposedly inelastic (i.e., steeply inclined), not only would exchange rates fluctuate frequently, but these fluctuations would be very large. These wild fluctuations in exchange rates would interfere with and reduce the degree of specialization in production and the flow of international trade and investments. In this form, the case in favor of fixed rates is as much a case *against* flexible exchange rates as it is a case in favor of fixed rates as such.

For example, in Figure 20.1, the shift over time in the U.S. demand curve for euros from the average of $D_{€}$ to $D'_{€}$ and then to $D^*_{€}$ causes the exchange rate to fluctuate from R' to R^* when the U.S. supply curve of euros is $S_{€}$, or more elastic, and from R'' to R^{**} when the U.S. supply curve of euros is $S'_{€}$, or less elastic.

Turning to the real world and back to Figure 14.3, we see that the exchange rate between the U.S. dollar and the currencies of the largest *(G-7)* industrial nations did fluctuate widely on a daily basis from 1980 to 2002. Since 1973, most nations have had managed rather than freely floating exchange rates. To the extent that the intervention of national monetary authorities in foreign exchange markets had some success in their alleged aim of smoothing out short-run fluctuations in exchange rates, fluctuations in exchange rates would have been even greater under a freely floating exchange rate system.

The question of time is also crucial. That is, elasticities are likely to be higher and thus exchange rate fluctuations lower in the long run than in the short run. But it is with the short-run instability in exchange rates that we are now primarily concerned. Excessive short-run fluctuations in exchange rates under a flexible exchange rate system may be costly in terms of higher frictional unemployment if they lead to over-frequent attempts at reallocating domestic resources among the various sectors of the economy. The short-run tendency of exchange rates to overshoot their long-run equilibrium level has also been noted in Section 15.5A and Case Study 15-7.

According to advocates of flexible exchange rates, the uncertainty and instability surrounding the large discrete changes in par values that periodically become necessary under a fixed exchange rate system are even more damaging and disruptive to the smooth flow of international trade and investments than the uncertainty inherent in fluctuating exchange rates. Furthermore, while the latter uncertainty can generally be hedged, the former cannot.

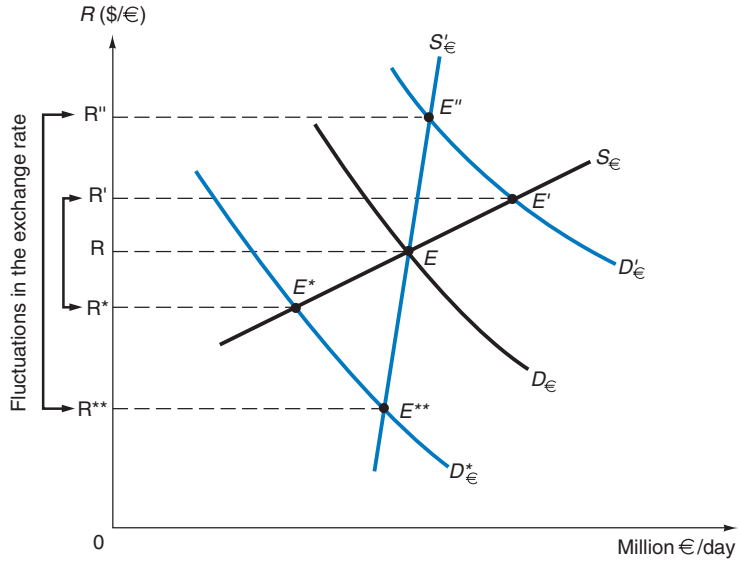

FIGURE 20.1. Shifts in the Nation's Demand Curve for Foreign Exchange and Uncertainty.
The shift over time in the U.S. demand curve for euros from the average $D_{€}$ to $D'_{€}$ and then to $D^*_{€}$ causes the exchange rate to fluctuate from R' to R^* when the U.S. supply curve of euros is $S_{€}$, or elastic, and from R'' to R^{**} when the U.S. supply curve is $S'_{€}$, or inelastic.

However, it must be pointed out that under a *truly* fixed exchange rate system, such as the gold standard, the exchange rate is always kept fixed, and so this source of uncertainty would be absent.

20.3B Stabilizing Speculation

According to advocates of fixed exchange rates, speculation is more likely to be *destabilizing* under a flexible than under a fixed exchange rate system. With destabilizing speculation, speculators purchase a foreign currency when the exchange rate is rising, in the expectation that the exchange rate will rise even more, and sell the foreign currency when the exchange rate is falling, in the expectation that the exchange rate will fall even more. In the process, the fluctuations in exchange rates resulting from business cycles are amplified, and so are the uncertainty and risks involved in international transactions. The opposite occurs under stabilizing speculation.

This is illustrated in Figure 20.2. Curve *A* shows the hypothetical fluctuation in the exchange rate that accompanies the business cycle in the absence of speculation (along an implicit depreciating trend of the dollar over the entire cycle). Curve *B* shows the smaller fluctuation in the exchange rate with stabilizing speculation, and curve *C* shows the larger fluctuation in the exchange rate with destabilizing speculation. The amplified fluctuations in exchange rates with destabilizing speculation increase the uncertainty and risk of international transactions and reduce the international flow of trade and investments. According to advocates of a fixed exchange rate system, this is more likely to occur when exchange rates are free to vary than when they are kept fixed.

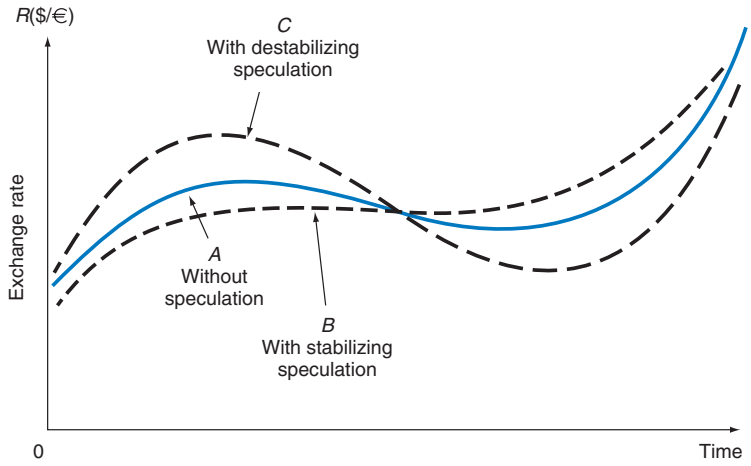

FIGURE 20.2. Fluctuations in Exchange Rate in the Absence of Speculation and with Stabilizing and Destabilizing Speculation.
Curve *A* shows the fluctuation in the exchange rate over the business cycle in the absence of speculation. Curve *B* shows the smaller fluctuation in the exchange rate with stabilizing speculation, while curve *C* shows the larger fluctuation in the exchange rate with destabilizing speculation.

Once again, advocates of flexible exchange rates disagree. They point out that destabilizing speculation is less likely to occur when exchange rates adjust continuously than when they are prevented from doing so until a large discrete adjustment can no longer be avoided. Anticipating a large change in exchange rates, speculators will then sell a currency that they believe is going to be devalued and buy a currency that they believe is going to be revalued (destabilizing speculation), and their expectations often become self-fulfilling. However, this is generally true only under a fixed exchange rate system of the Bretton Woods type, which did allow exchange rate changes in cases of "fundamental disequilibrium." Under a *truly* fixed exchange rate system, such as the gold standard, exchange rates are always kept fixed, and a balance-of-payments adjustment is achieved by other means, no matter how painful. In that case, speculation is almost certain to be stabilizing. But then that is also likely to be the case under a *truly* flexible exchange rate system.

According to Milton Friedman, speculation is stabilizing on the average because destabilizing speculation would lead to continuous losses by speculators, which would drive them out of business. That is, with destabilizing speculation, speculators buy a foreign currency when its price is rising in the expectation that its price will rise even more, but if it does not, they are forced to resell the currency at a lower price, thus incurring losses. If the process continues, it will bankrupt many of them. For speculators to make profits and remain in business, they must be able to purchase a foreign currency when it is cheap and resell it when it is expensive. This implies that speculation is stabilizing on the average. Some economists reject this argument and point out that the ranks of speculators who behave in a destabilizing manner are always replenished so that speculation can be destabilizing over a long period of time. Furthermore, the fact that destabilizing speculation would bankrupt them did not prevent speculators from behaving in a destabilizing fashion during the stock market crash in 1929 at the start of the Great Depression and more recently during the stock market crash of October 1987.

This is one of those arguments that could possibly be resolved only by examining real-world experiences. But when we turn to these, we find conflicting evidence. The interwar experience (i.e., between World War I and World War II) with flexible exchange rates clearly indicated the prevalence of destabilizing speculation, according to *Nurkse* (but this has more recently been subject to revision). This interwar experience strongly influenced the Allies at the close of World War II to establish a fixed exchange rate system (the Bretton Woods system). The Canadian experience with flexible exchange rates during the 1950s, however, showed that stabilizing speculation was prevalent.

The last days of the Bretton Woods system in the early 1970s were marred by chaotic conditions in foreign exchange markets, several exchange rate realignments, and clearly destabilizing speculation. On the other hand, the gold standard period (1880–1914) was definitely a time of stabilizing speculation. Under the managed floating system in operation since 1973, exchange rates have fluctuated widely on a daily basis, but there is no general agreement on whether speculation has been stabilizing or destabilizing on average. Perhaps there has been some of both.

Thus, destabilizing speculation can occur under a managed floating system of the type in operation today as well as under a fixed exchange rate system of the Bretton Woods type. However, a majority of economists seem to believe that, under "normal" conditions, speculation was for the most part stabilizing under both systems. Under a *truly* flexible and a *truly* fixed exchange rate system, speculation is almost certain to be stabilizing.

20.3c Price Discipline

Fixed exchange rates impose a price discipline on the nation not present under flexible exchange rates (the so-called anchor argument). That is, a nation with a higher rate of inflation than the rest of the world is likely to face persistent deficits in its balance of payments and loss of reserves under a fixed exchange rate system. Since deficits and reserve losses cannot go on forever, the nation needs to restrain its excessive rate of inflation and thus faces some price discipline. There is no such price discipline under a flexible exchange rate system, where balance-of-payments disequilibria are, at least in theory, automatically and immediately corrected by changes in the exchange rate. Knowing this, elected officials are more likely to overstimulate the economy in order to increase their chances of reelection.

On theoretical grounds, flexible exchange rates do seem more inflationary than fixed exchange rates. We saw in Chapter 16 that the depreciation of a nation's currency increases domestic prices. On the other hand, an appreciation does not result in a reduction in prices because of the downward inflexibility of prices in today's world. To be sure, a devaluation under a fixed exchange rate system is also inflationary, while a revaluation fails to reduce domestic prices. However, since fluctuating exchange rates lead to overshooting of the equilibrium exchange rate in both directions and cause prices to rise when depreciating but fail to reduce prices when appreciating (the so-called ratchet effect), inflation is likely to be higher under a flexible than under a fixed exchange rate system.

As pointed out earlier, we have had no real-world experience with *truly* flexible exchange rates, and so we must rely on the experience under the managed floating system. Managed floating since 1973 has coincided with sharp inflationary pressures throughout most of the world until the early 1980s, but not afterward. Furthermore, the inflationary pressures during the 1970s were as much, or even primarily, the result of the sharp increase in

petroleum prices and excessive money creation in most nations (and the resulting inflationary psychology) as of flexible exchange rates, as such. However, even if we exclude the more unstable years of the 1970s, we find that the economic performance of the leading industrial countries was better during the 1960–1973 period than during the 1983–2011 period (see Case Study 20-1).

Advocates of a flexible exchange rate system acknowledge that flexible rates can be more inflationary than fixed exchange rates. However, this results because nations desire different

CASE STUDY 20-1 Macroeconomic Performance under Fixed and Flexible Exchange Rate Regimes

Table 20.1 presents some indicators of the macroeconomic performance of the leading industrial (G-7) countries during the last 14 years of the fixed exchange rate period (i.e., from 1960 to 1973) and the 28 years from 1983 to 2011 of the present flexible (managed) exchange rate period. The years from 1974 to 1982 were excluded because the petroleum crises of 1973–1974 and 1979–1980 (and their aftermath) made this period quite unusual. The table shows that the rate of growth or real GDP was, on average, double, the rate of inflation was 50 percent higher, and the rate of unemployment was less than half during the fixed exchange rate period as compared with the flexible exchange rate period examined.

We cannot, however, attribute the better macroeconomic performance during the 1960–1973 period entirely or even primarily to fixed exchange rates because economic performance depends on many other factors, such as flexibility of labor markets, rate of technological change, and globalization. For example, rapid globalization may be responsible for the lower inflation rate during the managed exchange rate regime (despite the fact that we would expect the former to be less inflationary than the latter). In fact, when all the sources affecting economic performance are taken into consideration, it becomes difficult to say which system is better. It really depends on the nation and the circumstances under which it operates. In the final analysis, no exchange rate regime can substitute for sound economic policies.

TABLE 20.1. Macroeconomic Performance under Fixed and Flexible Exchange Rates, 1960–1973, 1983–2011

	Real GDP Growth		Inflation Rate		Unemployment Rate	
Country	1960–1973	1983–2011	1960–1973	1983–2011	1960–1973	1983–2011
United States	3.7%	3.1%	2.8%	2.9%	4.9%	6.3%
Japan	11.0	2.0	5.6	0.6	1.2	3.5
Germany	5.5	1.9	2.9	1.9	0.6	7.7
United Kingdom	2.9	2.1	4.5	3.3	2.8	7.5
France	6.0	1.9	4.3	2.7	1.8	9.9
Italy	5.7	1.4	3.8	4.3	3.1	9.2
Canada	5.0	2.8	2.8	2.8	5.1	8.8
Weighted average	5.7	2.2	3.8	2.6	2.8	7.6

Sources: Organization for Economic Cooperation and Developement, *Economic Outlook* (Paris: OECD, various issues); A. Ghosh, J. D. Ostry, and C. Tsangarides, *Exchange Rate Regimes and the Stability of the International Monetary System* (Washington, D.C.: IMF, 2010); and J. E. Gagnon, *Flexible Exchange Rates for a Stable World Economy* (Washington, D.C.: Peterson Institute for International Economics, 2011).

inflation–unemployment trade-offs and flexible exchange rates allow each nation to pursue its own stabilization policies—that is, to trade more inflation for less unemployment (or vice versa) as the nation sees fit. Advocates of flexible exchange rates view this as an important advantage of a flexible exchange rate system.

Flexible exchange rates to a large extent insulate the domestic economy from *external* shocks (such as an exogenous change in the nation's exports) much more than do fixed exchange rates. As a result, flexible rates are particularly attractive to nations subject to large external shocks. On the other hand, a fixed exchange rate system provides more stability to an open economy subject to large *internal* shocks.

For example, an autonomous increase in investment in the nation increases the level of national income according to the familiar multiplier process. The increase in income induces imports to rise and possibly causes a deficit in the nation's balance of payments under a fixed exchange rate system. At least for a time, the nation can finance the deficit out of its international reserves. Under a flexible exchange rate system, however, the nation's currency will automatically depreciate and stimulate its exports, which reinforces the tendency for the nation's income to rise. But the outcome can vary greatly when international capital flows are also considered. Furthermore, since 1973, business cycles seem to have become more, rather than less, synchronized even though exchange rates are floating.

By way of a summary, we might say that a flexible exchange rate system does not seem to compare unfavorably to a fixed exchange rate system as far as the type of speculation to which it gives rise and the degree of uncertainty that it introduces into international transactions when all factors are considered. Furthermore, flexible exchange rates are generally more efficient and do give nations more flexibility in pursuing their own stabilization policies. At the same time, flexible exchange rates are generally more inflationary than fixed exchange rates and less stabilizing and suited for nations facing large internal shocks. The greatest attraction of flexible exchange rates as far as monetary authorities are concerned is that they allow the nation to retain greater control over its money supply and possibly achieve a lower rate of unemployment than would be possible under a fixed or adjustable peg exchange rate system. However, this benefit is greatly reduced when, as in today's world, international capital flows are very large. The greatest disadvantage of flexible exchange rates is the lack of price discipline and the large day-to-day volatility and overshooting of exchange rates.

In general, a fixed exchange rate system is preferable for a small open economy that trades mostly with one or a few larger nations and in which disturbances are primarily of a monetary nature. On the other hand, a flexible exchange rate system seems superior for a large, relatively closed economy with diversified trade and a different inflation–unemployment trade-off than its main trading partners, and facing primarily disturbances originating in the real sector abroad.

20.3D The Open-Economy Trilemma

From the discussion thus far, we can see that in an open economy, policymakers face a policy trilemma in trying to achieve internal and external balance. They can attain only two of the following three policy choices: (1) a fixed exchange rate, (2) unrestricted international financial or capital flows, and (3) monetary policy autonomy, or independence. The nation can have a fixed exchange rate and unrestricted international financial flows (choices 1

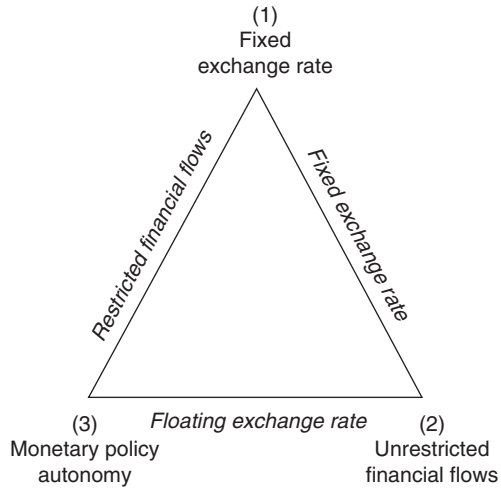

FIGURE 20.3. The Policy Trilemma for Open Economies.
Each corner of the triangle shows one policy choice open to the nation. The nation can attain only two of the three.

and 2) only by giving up monetary policy autonomy (choice 3); or it can have a fixed exchange rate and monetary policy autonomy (choices 1 and 3) only by restricting or controlling international financial flows (choice 2); or finally, it can have monetary policy autonomy and unrestricted international financial flows (choices 2 and 3) only by giving up a fixed exchange rate (choice 1).

The three policy trilemma that policymakers face in an open economy are shown by the corners of the triangle in Figure 20.3. If the nation chooses a fixed exchange rate and unrestricted international financial flows (the right leg of the triangle), it must give up monetary policy autonomy (as under the gold standard or any other rigidly fixed exchange rate system—see Section 16.6). In this case, a deficit nation will have to allow its money supply to fall for its trade and balance of payments deficit to be corrected (the opposite would be the case for a surplus nation). Conversely, if the nation chooses a fixed exchange rate and monetary policy autonomy (the left leg of the triangle), the nation must restrict international financial flows so as to retain control over its money supply. Finally, if the nation chooses to have monetary policy autonomy and unrestricted international financial flows, it cannot have a fixed exchange rate (i.e., it must accept a flexible exchange rate, as shown in the bottom leg of the triangle). Of course, a nation could choose an intermediate policy—for example, by accepting some exchange rate flexibility with either some loss of monetary policy autonomy or imposing some controls over international financial flows (or some of both).

20.4 Optimum Currency Areas, the European Monetary System, and the European Monetary Union

In this section we examine the theory of optimum currency areas, the European Monetary System, and the European Monetary Union with the creation of the European Central Bank and the common currency (the euro).

20.4A Optimum Currency Areas

The theory of optimum currency areas was developed by *Robert Mundell and Ronald McKinnon* during the 1960s. We are particularly interested in this theory for the light that it can shed on the conflict over fixed versus flexible exchange rates. An optimum currency area or bloc refers to a group of nations whose national currencies are linked through *permanently* fixed exchange rates and the conditions that would make such an area optimum. The currencies of member nations could then float jointly with respect to the currencies of nonmember nations. Obviously, regions of the same nation, sharing as they do the same currency, are optimum currency areas.

The formation of an optimum currency area eliminates the uncertainty that arises when exchange rates are not permanently fixed, thus stimulating specialization in production and the flow of trade and investments among member regions or nations. The formation of an optimum currency area also encourages producers to view the entire area as a single market and to benefit from greater economies of scale in production.

With permanently fixed exchange rates, an optimum currency area is likely to experience greater price stability than if exchange rates could change between the various member nations. The greater price stability arises because random shocks in different regions or nations within the area tend to cancel each other out, and whatever disturbance may remain is relatively smaller when the area is increased. This greater price stability encourages the use of money as a store of value and as a medium of exchange, and discourages inefficient barter deals arising under more inflationary circumstances. An optimum currency area also saves the cost of official interventions in foreign exchange markets involving the currencies of member nations, the cost of hedging, and the cost of exchanging one currency for another to pay for imports of goods and services and when citizens travel between member nations (if the optimum currency area also adopts a common currency).

Perhaps the greatest disadvantage of an optimum currency area is that each member nation cannot pursue its own independent stabilization and growth policies attuned to its particular preferences and circumstances. For example, a depressed region or nation within an optimum currency area might require expansionary fiscal and monetary policies to reduce an excessive unemployment rate, while the more prosperous region or nation might require contractionary policies to curb inflationary pressures. To some extent, this cost of an optimum currency area is compensated by the ability of workers to emigrate from the poorer to the richer members and by greater capital inflows into the poorer members. Despite the fact that national differences are likely to persist, few would suggest that poorer nations or regions would do better by not entering into or seceding from an optimum currency area or nation. (In December 1971, however, East Pakistan, charging exploitation, did break away from West Pakistan and proclaimed itself Bangladesh, and Quebec has threatened to secede from Canada for economic as well as cultural reasons.) Furthermore, poorer nations or regions usually receive investment incentives and other special aid from richer members or areas.

The formation of an optimum currency area is more likely to be beneficial on balance under the following conditions: (1) the greater the mobility of resources among the various member nations, (2) the greater their structural similarities, and (3) the more willing they are to closely coordinate their fiscal, monetary, and other policies. An optimum currency area should aim at maximizing the benefits from permanently fixed exchange rates and minimizing the costs. It is not easy, however, to actually measure the net benefits accruing to each member nation or region from joining an optimum currency area.

To be noted is that some of the benefits provided by the formation of an optimum currency area can also be obtained under the looser form of economic relationship provided by fixed exchange rates. Thus, the case for the formation of an optimum currency area is to some extent also a case for fixed as opposed to flexible exchange rates. The theory of optimum currency areas can be regarded as the special branch of the theory of customs unions (discussed in Chapter 10) that deals with monetary factors.

20.4B European Monetary System (1979–1998)

In March 1979, the European Union or EU (then called the European Economic Community or EEC) announced the formation of the European Monetary System (EMS) as part of its aim toward greater monetary integration among its members, including the ultimate goal of creating a common currency and a Community-wide central bank. The main features of the EMS were (1) the European Currency Unit (ECU), defined as the weighted average of the currencies of the member nations, was created. (2) The currency of each EU member was allowed to fluctuate by a maximum of 2.25 percent on either side of its central rate or parity (6 percent for the British pound and the Spanish peseta; Greece and Portugal joined later). The EMS was thus created as a fixed but adjustable exchange rate system and with the currencies of member countries floating jointly against the dollar. Starting in September 1992, however, the system came under attack, and in August 1993 the range of allowed fluctuation was increased from 2.25 percent to 15 percent (see Case Study 20-2). (3) The European Monetary Cooperation Fund (EMCF) was established to provide short- and medium-term balance-of-payments assistance to its members.

When the fluctuation of a member nation's currency reached 75 percent of its allowed range, a *threshold of divergence* was reached, and the nation was expected to take a number of corrective steps to prevent its currency from fluctuating outside the allowed range. If the exchange rate did reach the limit of its range, intervention burdens were to be shared symmetrically by the weak- and the strong-currency member. For example, if the French franc depreciated to its upper limit against the German mark, then the French central bank had to sell Deutsche mark (DM) reserves and the German central bank (the Bundesbank) had to lend the necessary DM to France.

Member nations were assigned a quota in the EMCF, 20 percent to be paid in gold (valued at the market price) and the remainder in dollars, in exchange for ECUs. The amount of ECUs grew rapidly as member nations converted more and more of their dollars and gold into ECUs. Indeed, ECUs became an important international asset and intervention currency. One advantage of the ECU was its greater stability in value with respect to any one national currency. It was anticipated that the EMCF would eventually evolve into an EU central bank. By the beginning of 1998, the total reserve pool of the EMCF was over $50 billion and the value of the ECU was $1.1042.

From March 1979 to September 1992, there was a total of 11 currency realignments of the EMS. In general, high-inflation countries such as Italy and France (until 1987) needed to periodically devalue their currency with respect to the ECU in order to maintain competitiveness in relation to a low-inflation country such as Germany. This points to the fundamental weakness of the EMS in attempting to keep exchange rates among member nations within narrowly defined limits without at the same time integrating their monetary, fiscal, tax, and other policies. As pointed out by *Fratianni and von Hagen* (1992), inflation in Italy

CASE STUDY 20-2 The 1992–1993 Currency Crisis in the European Monetary System

In September 1992, the United Kingdom and Italy abandoned the exchange rate mechanism (ERM), which allowed EU currencies to fluctuate only within narrowly defined limits, and this was followed by devaluations of the Spanish peseta, Portuguese escudo, and Irish pound between September 1992 and May 1993. High German interest rates to contain inflationary pressures (resulting from the high cost of restructuring East Germany) made the German mark strong against other currencies and have been widely blamed for the tensions in the EMS. In the face of deepening recession and high and rising unemployment, the United Kingdom and Italy felt that the cost of keeping exchange rates within the ERM had become unbearable and so they abandoned it. This allowed their currencies to depreciate and their interest rates to be lowered—both of which stimulated growth.

But this was not the end of the crisis. When the Bundesbank (the German central bank) refused to lower the discount rate, as many financial analysts and currency traders had expected in August 1993, speculators responded by unloading the currencies of France, Denmark, Spain, Portugal, and Belgium with a vengeance. (The United Kingdom and Italy had already left the ERM and were not directly affected.) After massive interventions in foreign exchange markets, especially by the Bank of France in concert with Bundesbank, failed to put an end to the massive speculative attack, European Union finance ministers agreed to abandon the narrow band of fluctuation of ± 2.25 percent for a much wider band of ± 15 percent on either side of their central rates.

During the crisis, the Bundesbank sold more than $35 billion worth of marks in support of the franc and other currencies, and the total spent on market intervention by all the central banks involved may have exceeded $100 billion. But with more than $1 trillion moving each day through foreign exchange markets, even such massive intervention could not reverse market forces in the face of a massive speculative attack. Greatly widening the band of allowed fluctuation put an end to the speculative attack, but exchange rates remained close to their precrisis level.

Source: D. Salvatore, "The European Monetary System: Crisis and Future," *Open Economies Review*, December 1996, pp. 593–615.

and France during the 1979–1987 period was restrained by the presence of Germany in the EMS, and this reduced the need for higher real appreciations of the Deutsche mark. France and Italy, however, paid a price in terms of greater unemployment for the gradual convergence toward Germany's low inflation rate. The EU's desire to stabilize exchange rates was understandable in view of the large exchange rate fluctuations since 1973 (see Case Study 20-2). Empirical evidence (see *Giavazzi and Giovannini*, 1989, and *MacDonald and Taylor*, 1991) indicates that variations in nominal and real exchange rates and money supplies among EMS members were smaller than among nonmembers, at least until September 1992.

20.4c Transition to Monetary Union

In June 1989, a committee headed by Jacques Delors, the president of the European Commission, recommended a three-stage transition to the goal of monetary union. The first stage, which started in July 1990, called for convergence of economic performance and cooperation

in monetary and fiscal policy, as well as the removal of all restrictions to intra-Community capital movements. The second stage, approved at a meeting in the Dutch city of Maastricht in December 1991, called for the creation of a European Monetary Institute (EMI) as the forerunner of a European Central Bank (ECB) to further centralize members' macroeconomic policies and reduce exchange rate margins by January 1994. (The EMI was, in fact, established as scheduled in 1994.) The third stage was to involve the completion of the monetary union by either 1997 or 1999 with the establishment of a single currency and a European Central Bank that would engage in foreign exchange market interventions and open market operations. This meant that member nations relinquished sovereign power over their money supply and monetary policy. In addition, they would no longer have full freedom over their budget policies. With a common central bank, the central bank of each nation would assume functions not unlike those of Federal Reserve banks in the United States.

The Maastricht Treaty set several conditions before a nation could join the monetary union: (1) The inflation rate must not exceed by more than 1.5 percentage points the average rate of the three Community nations with the lowest rate; (2) its budget deficit must not exceed 3 percent of its GDP; (3) its overall government debt must not exceed 60 percent of its GDP; (4) long-term interest rates must not exceed by more than two points the average interest rate of the three countries with the lowest inflation rates; and (5) its average exchange rate must not fall by more than 2.25 percent of the average of the EMS for the two years before joining. By 1991, only France and Luxembourg had met all of these criteria. Because the cost of reunification pushed its budget deficit to 5 percent of its GDP, Germany did not meet all conditions for joining in 1991. Italy, with its budget deficit of 10 percent of GDP and overall debt of more than 100 percent of GDP, did not meet any of the conditions. By 1998, however, most member countries of the European Union had met most of the Maastricht criteria (see Case Study 20-3), and the stage was set for true monetary union.

In 1997, the Stability and Growth Pact (SGP) was negotiated to further tighten the fiscal constraint under which countries participating in the monetary union would operate. The SGP required member countries to aim at budget deficits smaller than 3 percent of GDP, so that in case of recession the nation could conduct expansionary fiscal policy and still remain below the 3 percent guideline. Nations that violated the fiscal indicator would be subject to heavy fines. Germany demanded the Pact as a condition for proceeding toward monetary union in order to make sure that fiscal discipline would prevail in the monetary union and avoid excessive money creation, inflation, and a weak euro. The irony is that it was precisely Germany (and France) that was unable to meet the SGP in 2003, when its budget deficit reached 4 percent of its GDP, and this led to the relaxation of the SGP's rules by adding some loopholes in 2005.

Throughout the negotiations, the United Kingdom tried consistently to slow the EU's moves toward greater economic and political union for fear of losing more of its sovereignty. The United Kingdom refused to promise that it would give up the pound sterling as its national currency or that it would accept Community-wide labor legislation. Differences in culture, language, and national temperament made progress toward monetary union difficult, and the future admission of the new democracies of Eastern and Central Europe was expected to greatly complicate matters. Nevertheless, the Maastricht Treaty operated as the bridge that led to true monetary union in Europe at the beginning of 1999, when the ECB (created in 1998) began to operate and the euro came into existence.

20.4D Creation of the Euro

At the beginning of 1999, the European Monetary System became the European Monetary Union (EMU) with the introduction of the euro and a common monetary policy by the European Central Bank. On January 1, 1999, the euro (€) came into existence as the common currency of 11 countries of the euro area or Euroland (Austria, Belgium, Germany, Finland,

CASE STUDY 20-3 Maastricht Convergence Indicators

Table 20.2 gives the value of four of the five Maastricht indicators for the 15 member countries of the European Union in January 1998. This information, together with the exchange rate indicator (not shown in the table) is what the European Commission used to determine which member nations were eligible to participate in the single currency. From the table we see that all countries, except Greece, satisfied the inflation, public deficit, and long-term interest indicators, but eight countries did not satisfy the public debt criterion. Furthermore, Ireland did not meet the exchange rate indicator. The European Commission, however, ruled that all countries (except Greece) had made sufficient progress for all to participate in the single currency. The United Kingdom, Denmark, and Sweden chose not to participate because of their unwillingness to lose complete control over their money supply and monetary policy, but they reserved the right to join later. Greece was admitted on January 1, 2001, Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009, and Estonia in 2011—thus increasing the number of members of the Eurozone countries to 17 (see Figure 20.4).

TABLE 20.2. EU Members' Maastricht Convergence Indicators, January 1998

	Inflation Rate (%)	Public Deficit[a] as % of GDP	Public Debt[a] as % of GDP	Long-term Interest Rate (%)
Germany	1.4	2.5	61.2[b]	5.6
France	1.2	2.9	58.1	5.5
Italy	1.8	2.5	118.1[b]	6.7
United Kingdom	1.8	0.6	52.3	7.0
Austria	1.1	2.3	64.7[b]	5.6
Belgium	1.4	1.7	118.1[b]	5.7
Denmark	1.9	−1.1	59.5	6.2
Greece	5.2[b]	2.2	107.7[b]	9.8[b]
Finland	1.3	−0.3	53.6	5.9
Ireland	1.2	−1.1	59.5	6.2
Luxembourg	1.4	−1.0	7.1	5.6
Netherlands	1.8	1.6	70.0[b]	5.5
Portugal	1.8	2.2	60.0	6.2
Spain	1.8	2.2	67.4[b]	6.3
Sweden	1.9	0.5	74.1[b]	6.5
EU average	1.6	1.9	70.5	6.1
Reference value	2.7	3.0	60.0	7.8

[a]Forecast.
[b]Country not satisfying criteria.
Source: European Commission, *Convergence Report 1999* (Brussels: European Commission, 1998).

(continued)

CASE STUDY 20-3 Continued

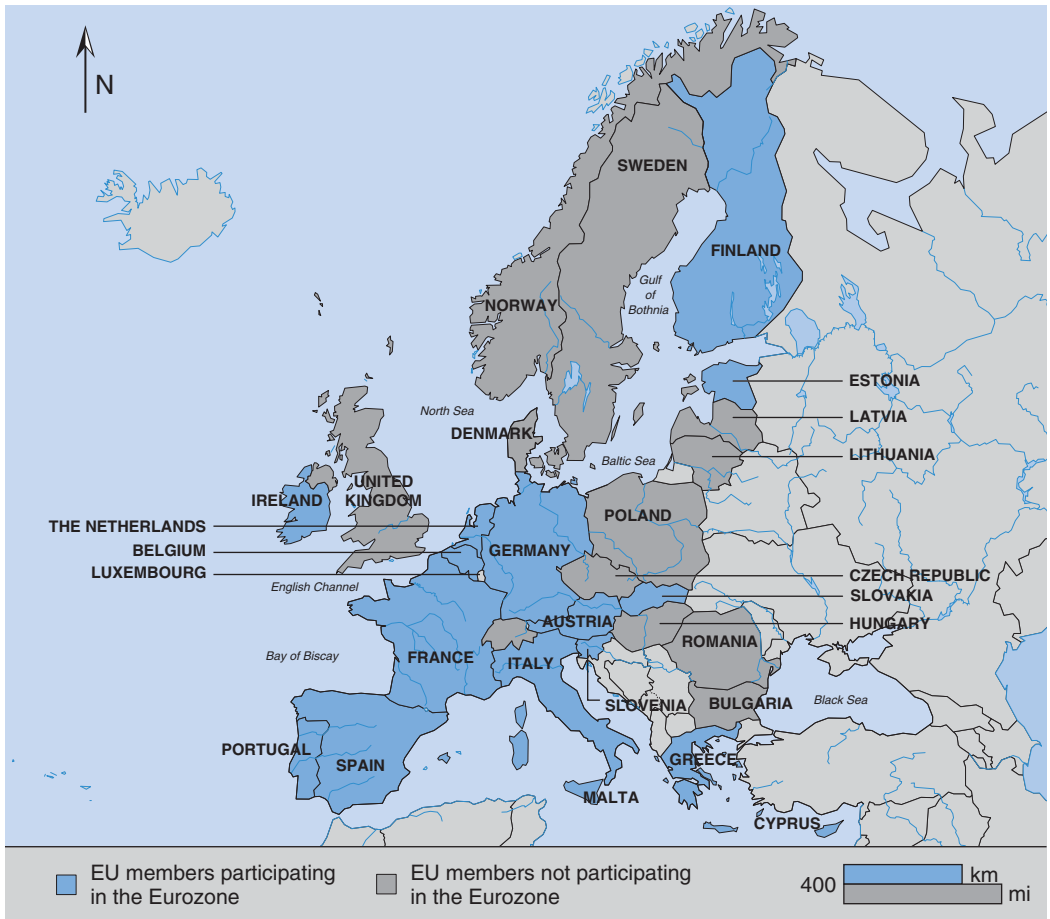

FIGURE 20.4. **The Eurozone Countries as of the Beginning of 2012.**
As of the beginning of 2012, the 17 members of the Eurozone were Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain.

France, Ireland, Italy, Luxembourg, Spain, Portugal, and the Netherlands). Greece was admitted on January 1, 2001. Britain, Sweden, and Denmark chose not to participate. The creation of the euro is one of the most important events in postwar monetary history: Never before had a large group of sovereign nations voluntarily given up their own currency for a common currency.

From January 1, 1999, euros were traded in financial markets, new issues of securities were denominated in euros, and official statistics in the euro area were quoted in euros, but euro bank notes and coins were not introduced until the beginning of 2002. That is, until that date, the euro was only a unit of account and not an actual physical circulating currency.

■ TABLE 20.3. Official Currency Conversion Rates for the Euro

Country	National Currency	Currency Units per Euro
Austria	schilling	13.7603
Belgium	Belgian franc	40.3399
Finland	markka	5.94573
France	French franc	6.55957
Germany	Deutsche mark	1.95583
Ireland	punt	0.787564
Italy	Italian lira	1936.27
Luxembourg	Luxembourg franc	40.3399
Netherlands	guilder	2.20371
Portugal	escudo	200.482
Spain	peseta	166.386

Source: ''The Launch of the Euro,'' *Federal Reserve Bulletin,* October 1999, pp. 655–666.

From January 1 until July 1, 2002, euros and national currencies circulated together for nations that so chose, but by July 1, 2002, all national currencies were phased out (taken out of circulation), and euro paper currency and coins became the sole legal tender in the 12 participating members of the euro area.

The value of the euro in terms of the participating currencies was decided in the fall of 1998 and became rigidly fixed (i.e., it could not be changed). The official euro conversion rates for the currencies of the participating countries are given in Table 20.3.

From January 1, 1999, until January 1, 2002, the exchange rate of the euro fluctuated in terms of other currencies, such as the U.S. dollar, the British pound, the Japanese yen, and so on, but the value of each participating currency remained rigidly fixed in terms of euros. This means that the exchange rates of the currencies participating in the euro fluctuated in relation to other currencies only to the extent that the euro fluctuated in relation to those other currencies. For example, if the dollar price of the euro is \$1.10, the dollar value of the Deutsche mark is 10 percent higher than the Deutsche mark price of the euro, or 1.10×1.95583, which was equal to \$2.151413. If, then, the euro depreciated to \$1.05, the dollar price of the Deutsche mark became 1.05×1.95583, or \$2.0536215.

In order to avoid excessive volatility and possible misalignments between the currencies of the United Kingdom, Sweden, and Denmark and the euro, the Exchange Rate Mechanism II (ERM II) was set up, similar to the one operating under the European Monetary System. As experience with the 1992–1993 ERM crisis showed, however, such a system is unstable and crisis prone. But it is in the interest of the United Kingdom, Sweden, and Denmark to limit even more the fluctuation of their currencies vis-à-vis the euro to facilitate their future possible adoption of the euro (see *Salvatore*, 2000). In June 2004, Estonia, Lithuania, and Slovenia joined ERM II with a 15 percent band of fluctuation around parity.

The euro was introduced on January 1, 1999, at the exchange rate of €1 = \$1.17 but, contrary to most experts' opinion, it fluctuated downward to just below parity (i.e., €1 = \$1) by the end of 1999. It actually fell to a low of \$0.82 at the end of October 2000 before returning to near parity with the dollar by the middle of 2002. It then rose to a high of \$1.36 in December 2004, to the all-time high of \$1.63 in July 2008, and it was \$1.32 in March 2012 (see Case Study 15-8). The creation of the euro provides major benefits to euro-area countries but also imposes significant costs, especially in the short run (see Case Study 20-4).

CASE STUDY 20-4 Benefits and Costs of the Euro

The adoption of the euro as the common currency of the euro-area countries confers major benefits on the participating countries, but it also led to significant costs. The benefits are: (1) elimination of the need to exchange currencies among euro-area members (this has been estimated to save as much as $30 billion per year); (2) elimination of exchange rate volatility among the currencies of participating countries; (3) more rapid economic and financial integration of participating nations; (4) the ability of the European Central Bank to conduct a more expansionary monetary policy than the one practically imposed by the German Bundesbank on other members of the European Union in the past; (5) greater economic discipline for countries such as Greece and Italy, which seemed unwilling or unable to put their houses in order without externally imposed conditions; (6) seignorage from use of the euro as an international currency (see Case Study 14-1); (7) reduced cost of borrowing in international financial markets; and (8) increased economic and political importance for the European Union in international affairs.

The most serious problem created by the adoption of the euro for the participating countries arises when only one or a few of them face a recession or some other asymmetric shock. The reason is that the nation or nations so affected can use neither exchange rate nor monetary policy to overcome the problem, and (as indicated) fiscal policy is also severely constrained or limited. In such a situation, the nation or nations must then wait for the problem to be resolved by itself, gradually, over time. In a more fully integrated economy, such as the United States, if a region is in a recession, some labor will immediately move out and the region will also benefit from a great deal of fiscal redistribution (such as greater unemployment insurance receipts). In the EMU, instead, labor mobility is much lower than in the United States, and so is fiscal redistribution. Thus, it will be much more difficult for a nation of the euro area to deal with an asymmetric shock. It is true that economic integration will encourage intra-EMU labor mobility, but this is a slow process that is likely to take years to complete. Capital mobility within the euro area, however, can to some extent substitute for inadequate labor mobility in overcoming the problem.

Sources: G. Fink and D. Salvatore, "Benefits and Costs of European Economic and Monetary Union," *The Brown Journal of World Affairs*, Summer/Fall 1999, pp. 187–194; D. Salvatore, "The Unresolved Problem with the EMS and EMU," *American Economic Review Proceedings*, May 1997, pp. 224–226; and D. Salvatore, "Euro," *Princeton Encyclopedia of the World Economy* (Princeton, N.J.: Princeton University Press, 2008), pp. 350–352.

20.4E The European Central Bank and the Common Monetary Policy

In 1998, the European Central Bank (ECB) was established as the operating arm of the *European System of Central Banks (ESCB)*, a federal structure of the national central banks of the European Union. In January 1999, the ECB assumed responsibility for the common EMU monetary policy. ECB's monetary decisions are made by a majority vote of the governing council, composed of a six-member executive board (including the president of the ECB, who was Willem F. Duisenberg of the Netherlands until 2003, Jean-Claude Trichet of France until 2011, and Mario Draghi of Italy since then) and the heads of the participating national central banks.

The Maastricht Treaty entrusted the ECB with the sole goal of pursuing price stability and made it almost entirely independent of political influences. The ECB is required only to regularly brief the European Parliament on its activities, but the European Parliament has no power to influence ECB's decisions. While the U.S. Congress could pass laws reducing

the independence of the Federal Reserve Board, the Maastricht Treaty itself would have to be amended by the legislatures or voters in every member country for the ECB's statute to be changed. The almost total independence of the ECB from political influence was deliberate so as to shield the ECB from being forced to provide excessive monetary stimulus, and thus lead to inflation. But this also led to the criticism that the ECB is distant and undemocratic, and not responsive to the economic needs of the citizens.

Strangely, however, the exchange rate policy of the euro is ultimately in the hands of politicians rather than of the ECB. This is puzzling because monetary and exchange rate policies are closely related, and it is impossible to conduct a truly independent policy in one without the other. Be that as it may, the EMU's first year of operation in 1999 was somewhat turbulent, with politicians demanding lower interest rates to stimulate growth and with the ECB for the most part resisting for fear of resurgent inflation. The conflict in the conduct of a unionwide monetary policy also became evident during 1999, when nations such as Ireland and Spain faced excessive growth and the danger of inflation (hence requiring a more restrictive monetary policy), while other nations (such as Germany and Italy) faced anemic growth (hence requiring lower interest rates).

As it was, the ECB adopted an intermediate monetary policy, with interest rates possibly being too low for Ireland and Spain and too high for Germany and Italy. From 2000 to 2008, the ECB conducted a fairly tight monetary policy (tighter than the one pursued by the U.S. Fed) for fear of resurgent inflation and in order to establish its credibility. Starting in fall 2008, however, the ECB slashed interest rates to fight the deep recession and economic crisis facing the Eurozone (see Case Study 20-5).

CASE STUDY 20-5 The Eurozone Crisis

Before the 2008–2009 global economic crisis ended, the Eurozone fell into a serious crisis that threatened its very existence in 2010–2011 and is still continuing, as of this writing in 2012. The crisis has affected primarily Ireland, Greece, Portugal, Spain, and Italy and has resulted from excessive and unsustainable borrowing in the face of slow growth or recession (see Table 20.4).

Excessive borrowing resulted when the borrowing costs of the weak nations fell drastically when joining the euro. But in the face of slow growth or recession in 2008–2009, it became clear that these nations would be unable to repay their loans. The collapse of Ireland, Portugal, and especially Greece was avoided only by huge bailouts or rescue packages by the richer Eurozone countries (primarily Germany) and by the European Central Bank (ECB) purchasing the government bonds of the weak nations and providing more than 800 European banks in excess of $1.3 trillion of loans for three years at 1 percent interest (which the banks immediately used to buy government bonds paying 5 to 6 percent interest). In exchange, weak nations agreed to a new stability pact that called for keeping budget deficits to no more than 0.5 percent of GDP in good or normal times (as compared with the previous Maastricht criteria of 3 percent of GDP) and reinforcing the debt ceiling criteria of 60 percent of GDP. Fiscal austerity, however, further slowed down growth or plunged weak nations into recession. The Euro crisis was really a crisis waiting to happen in view of the halfway house that the Eurozone represents, with a common monetary policy but a mostly independent fiscal policy.

Sources: D. Salvatore, "The Common Unresolved Problem of the EMS and EMU," *American Economic Review*, May 1997, pp. 224–226; and O. Issing, "The Crisis of European Monetary Union—Lessons to Be Drawn," *Journal of Policy Modeling*, September/October 2011, pp. 737–749.

(continued)

■ CASE STUDY 20-5 Continued

■ TABLE 20.4. Government Debts and Budget Deficits of Eurozone Countries in 2011

Country	Budget Deficit as Percent of GDP	Government Debt as Percent of GDP	Percentage Growth of Real GDP
Germany	1.0	87.2	3.1
Austria	2.6	79.7	3.0
Belgium	3.9	102.3	2.0
Netherlands	4.6	75.2	1.3
France	5.2	100.1	1.7
Italy	3.8	119.7	0.5
Portugal	4.2	117.6	–1.6
Spain	8.5	75.3	0.7
Greece	9.2	170.0	–6.9
Ireland	13.0	114.1	0.7

Source: Organization for Economic Cooperation and Development, *Economic Outlook* (Paris, OECD, May 2012).

20.5 Currency Boards Arrangements and Dollarization

In this section, we examine the benefits and costs of rigidly pegging or fixing the nation's exchange rate by establishing a currency board or by adopting another nation's currency (dollarization). In the next section, we then focus on the advantages and disadvantages of hybrid exchange rate systems that combine some of the characteristics of fixed and flexible exchange rates in various degrees.

20.5A Currency Board Arrangements

Currency board arrangements (CBAs) are the most extreme form of exchange rate peg (fixed exchange rate system), short of adopting a common currency or dollarizing (i.e., adopting the dollar as the nation's currency). Under CBAs, the nation rigidly fixes (often by law) the exchange rate of its currency to a foreign currency, SDR, or composite, and its central bank ceases to operate as such. CBAs are similar to the gold standard in that they require 100 percent international-reserve backing of the nation's money supply. Thus, the nation gives up control over its money supply, and its central bank abdicates its function of conducting an independent monetary policy. With a CBA, the nation's money supply increases or decreases, respectively, only in response to a balance-of-payments surplus and inflow of international reserves or to a balance-of-payments deficit and outflow of international reserves. As a result, the nation's inflation and interest rates are determined, for the most part, by conditions in the country against whose currency the nation pegged or fixed its currency.

A nation usually makes this extreme arrangement when it is in deep financial crisis and as a way to effectively combat inflation. CBAs have been in operation in several countries or economies, such as Hong Kong (since 1983), Argentina (from 1991 to the end of 2001), Estonia (from 1992 to the end of 2010), Lithuania (since 1994), Bulgaria (since 1997), and Bosnia and Herzogovina (since 1997). The key conditions for the successful operation of CBAs (besides those generally required for the successful operation of a fixed exchange

rate system) are a sound banking system (since the central bank cannot be the "lender of last resort" or extend credit to banks experiencing difficulties) and a prudent fiscal policy (since the central bank cannot lend to the government).

The main advantage of CBAs is the credibility of the economic policy regime (since the nation is committed politically and often by law to stick with it), which results in lower interest rates and lower inflation in the nation. The cost of CBAs is the inability of the nation's central bank to (1) conduct its own monetary policy, (2) act as a lender of last resort, and (3) collect seignorage from independently issuing its own currency. Case Study 20-6 examines Argentina's experience with CBAs during the 1990s.

20.5B Dollarization

Some nations go even further than making CBAs by adopting another nation's currency as its own legal tender. Even though the nation can adopt the currency of any other nation, the process is usually referred to as dollarization. Besides the Commonwealth of Puerto Rico and the U.S. Virgin Islands, Panama has had full or official dollarization

CASE STUDY 20-6 Argentina's Currency Board Arrangements and Crisis

Argentina had a currency board from 1991 until the end of 2001, when it collapsed in the face of a deep economic crisis. Argentina's CBA operated reasonably well until Brazil was forced first to devalue its currency (the real) in 1999 and then allowing it to sharply depreciate. With the peso rigidly tied to the dollar, Argentina suffered a huge loss of international competitiveness vis-à-vis Brazil (its largest trade partner) and plunged into recession. But having a grossly overvalued currency was not the only reason for Argentina's economic crisis. Even more serious was its out-of-control budget deficit. Argentina was simply living beyond its possibilities and this was unsustainable. The overvaluation of the peso only made the crisis deeper. Tightening up its public finances in order to encourage foreign investments deepened the recession and led to riots in the streets without attracting new foreign investments. Foreign investors feared that Argentina would be forced to abandon its currency board and devalue the peso, which would lead to losses and possibly even restrictions on repatriation of the capital invested.

This left Argentina only two choices: devalue the peso or full dollarization. Argentina was very reluctant to abandon its CBA and devalue the peso for fear of returning to the condition of hyperinflation of the late 1980s. Dollarization was not without risks either. Specifically, while it would eliminate the foreign exchange risk and very likely attract more foreign investments, dollarization would not eliminate Argentina's international competitiveness problem, especially with respect to Brazil, nor would it solve Argentina's budget problems. As it was, in January 2002, Argentina defaulted on its huge foreign debt and was forced first to abandon its currency board and devalue the peso, and then let it float. By fall 2002, the peso had depreciated from 1 peso to the dollar under the CBA to more than 3.5 pesos per dollar (a 250 percent depreciation). Argentina eventually repaid only 25 cents on the dollar to foreign holders of its bonds.

Source: A. de la Torre, E. Yeyati, and E. Talvi, "Living and Dying with Hard Pegs: The Rise and Fall of Argentina's Currency Board," in G. von Furstenberg, V. Alexander, and J. Melitz, Eds., *Monetary Unions and Hard Pegs* (New York: Oxford University Press, 2004), pp. 183–230.

since 1904. Ecuador fully dollarized in 2000 and El Salvador in 2001. Since 2001, Nicaragua has nearly fully dollarized and Costa Rica has considered it.

The benefits and costs of dollarization are similar to those arising from adopting a CBA, only they are more pronounced because dollarization involves an even more complete renouncement of the nation's monetary sovereignty by practically giving up an "exit option" to abandon the system. The benefits of dollarization arise from the nation (1) avoiding the cost of exchanging the domestic currency for dollars and the need to hedge foreign exchange risks; (2) facing a rate of inflation similar to that of the United States as a result of commodity arbitrage, and interest rates tending to fall to the U.S. level, except for any remaining country risk (i.e., political factors that affect security and property rights in the nation); (3) avoiding foreign exchange crises and the need for foreign exchange and trade controls, fostering budgetary discipline; and (4) encouraging more rapid and full international financial integration.

Dollarization also imposes some costs on the dollarizing country: (1) the cost of replacing the domestic currency with the dollar (estimated to be about 4 to 5 percent of GDP for the average Latin American country); (2) the loss of independence of monetary and exchange rate policies (the country will face the same monetary policy of the United States, regardless of its cyclical situation); and (3) the loss of its central bank as a lender of last resort to bail out domestic banks and other financial institutions facing a crisis.

Good candidates for dollarization are small open economies for which the United States is the dominant economic partner and which have a history of poor monetary performance, and hence very little economic-policy credibility. Most of the small countries of Latin America, especially those in Central America, as well as the Caribbean nations, fit this description very well. Once we move from small to large countries, however, it becomes more difficult to come up with clear-cut answers as to whether dollarization would provide a net benefit to the nation.

20.6 Exchange Rate Bands, Adjustable Pegs, Crawling Pegs, and Managed Floating

In this section, we examine the advantages and disadvantages of hybrid exchange rate systems that combine some of the characteristics of fixed and flexible exchange rates in various degrees. These involve different exchange rate bands of fluctuation about a par value, or fixed exchange rate, adjustable peg systems, crawling pegs, and managed floating.

20.6A Exchange Rate Bands

Most fixed exchange rate systems usually allow the exchange rate to fluctuate within narrowly defined limits. That is, nations decide on the exchange rate, or par value, of their currencies and then allow a narrow band of fluctuation above and below the par value. For example, under the Bretton Woods system, which operated during the postwar period until 1971, the exchange rate was allowed to fluctuate within 1 percent above and below the established par value, or fixed exchange rate. Under the gold standard, the exchange rate, say between the dollar and the pound, could fluctuate above and below the mint parity (the so-called gold points) by the cost of transporting and insuring £1 worth of gold between New York and London (see Section 16.6A).

The actual exchange rate under a fixed exchange rate system is then determined by the forces of demand and supply within the band of fluctuation, and it is prevented from moving outside this band by official interventions in foreign exchange markets under a fixed exchange rate not tied to gold and by gold shipments under the pure gold standard (as explained in Chapter 16). In what follows, we concentrate on a fixed exchange rate system not tied to gold. The advantage of the small band of fluctuation under a fixed exchange rate system is that monetary authorities will not have to intervene constantly in foreign exchange markets to maintain the established par value, but only to prevent the exchange rate from moving outside the allowed limits of fluctuation.

The overall band of fluctuation under a fixed exchange rate system is shown in the top panel of Figure 20.5, where the par value, or fixed exchange rate between the dollar and the euro, is assumed to be $R = \$/€ = 1$ and is allowed to fluctuate within 1 percent above and below the par value (as under the Bretton Woods system). As a result, the band of fluctuation (given by the dashed horizontal lines) is defined by $R = \$0.99$ (the lower limit) and $R = \$1.01$ (the upper limit).

Thus, a fixed exchange rate system exhibits some elements of flexibility about the fixed exchange rate, or par value. Technically, nations could increase the width of the band of allowed fluctuation and let the actual exchange rate be determined more and more by market forces, thus reducing more and more the need for official intervention. Ultimately, the band of allowed fluctuation could be made so wide as to eliminate all official intervention in foreign exchange markets. This would essentially represent a flexible exchange rate system. A preference for fixed exchange rates would allow only a very narrow band of fluctuation, while a preference for flexible exchange rates would make the band very wide.

20.6B Adjustable Peg Systems

An adjustable peg system requires defining the par value and the allowed band of fluctuation, with the stipulation that the par value will be changed periodically and the currency devalued to correct a balance-of-payments deficit or revalued to correct a surplus. The Bretton Woods system (see Chapter 21) was originally set up as an adjustable peg system, with nations allowed to change the par value of their currencies when faced with a "fundamental" disequilibrium. Nowhere was fundamental disequilibrium clearly defined, but it broadly referred to a large actual or potential deficit or surplus persisting over several years.

However, under the Bretton Woods system, nations—both for national prestige reasons and for fear that frequent changes in exchange rates would encourage destabilizing speculation (and for the United States also because the dollar was held as international reserves)—were generally unwilling to change par values until practically forced to do so, often under conditions of destabilizing speculation. Thus, while the Bretton Woods system was set up as an adjustable peg system, in fact it operated more nearly as a truly fixed exchange rate system.

A truly adjustable peg system would be one under which nations with balance-of-payments disequilibria would in fact take advantage (or be required to take advantage) of the flexibility provided by the system and change their par values without waiting for the pressure for such a change to become unbearable. This is shown in the middle panel of Figure 20.5, where the original par value is the same as in the top panel, and then the nation at the beginning of the fourth month *either* devalues its currency (raises the exchange rate) if faced with a balance-of-payments deficit *or* revalues (lowers the exchange rate) if faced with a surplus.

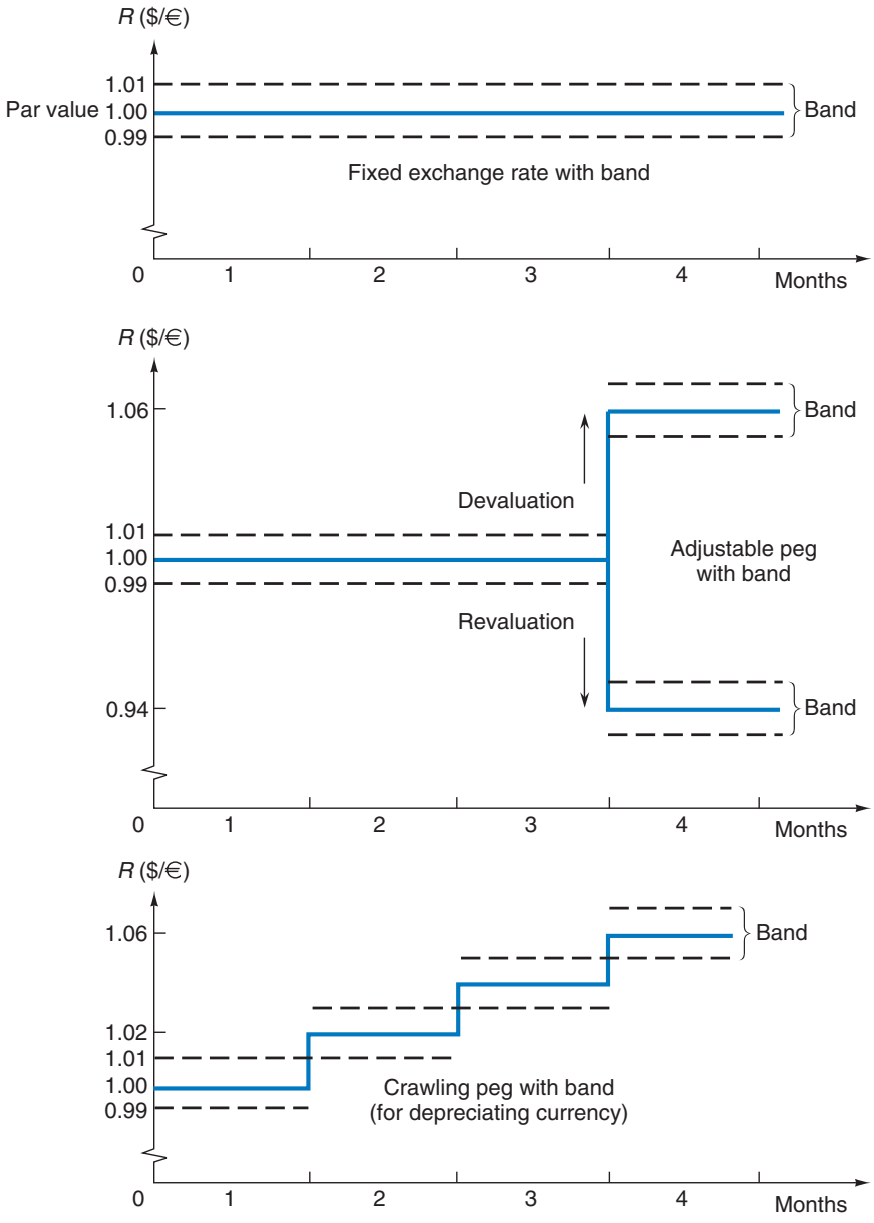

FIGURE 20.5. Exchange Rate Band, Adjustable Pegs, and Crawling Pegs.
In the top panel, the par value is R = \$1/€1, and the exchange rate is allowed to fluctuate by 1 percent above and below the par value established. The middle panel shows the nation devaluating its currency from R = \$1.00 to R = \$1.06 to correct a balance-of-payments deficit, or revaluing from R = \$1.00 to R = \$0.94 to correct a surplus in its balance of payments. The bottom panel shows the nation devaluing its currency by about 2 percent at the end of each of three months to correct a deficit in its balance of payments.

For an adjustable peg system to operate as intended, however, some objective rule would have to be agreed upon and enforced to determine when the nation must change its par value (such as when the international reserves of the nation fell by a certain percentage). Any such rule would to some extent be arbitrary and would also be known to speculators, who could then predict a change in the par value and profitably engage in destabilizing speculation.

20.6C Crawling Pegs

It is to avoid the disadvantage of relatively large changes in par values and possibly destabilizing speculation that the crawling peg system or system of "sliding or gliding parities" was devised. Under this system, par values are changed by small preannounced amounts or percentages at frequent and clearly specified intervals, say every month, until the equilibrium exchange rate is reached. This is illustrated in the bottom panel of Figure 20.5 for a nation requiring a devaluation of its currency. Instead of a single devaluation of 6 percent required after three months, the nation devalues by about 2 percent at the end of each of three consecutive months.

The nation could prevent destabilizing speculation by manipulating its short-term interest rate so as to neutralize any profit that would result from the scheduled change in the exchange rate. For example, an announced 2 percent devaluation of the currency would be accompanied by a 2 percent increase in the nation's short-term interest rate. However, this would interfere with the conduct of monetary policy in the nation. Nevertheless, a crawling peg system can eliminate the political stigma attached to a large devaluation and prevent destabilizing speculation. The crawling peg system can achieve even greater flexibility if it is combined with wide bands of fluctuation.

Note that if the upper limit of the band before a mini-devaluation coincides with (as in the figure) or is above the lower limit of the band after the mini-devaluation, then the devaluation may result in no change in the actual spot rate. Nations wanting to use a crawling peg must decide the frequency and amount of the changes in their par values and the width of the allowed band of fluctuation. A crawling peg seems best suited for a developing country that faces real shocks and differential inflation rates.

20.6D Managed Floating

Even if speculation were stabilizing, exchange rates would still fluctuate over time (if allowed) because of the fluctuation of real factors in the economy over the business cycle. Destabilizing speculation and overshooting would amplify these intrinsic fluctuations in exchange rates. As we have seen, exchange rate fluctuations tend to reduce the flow of international trade and investments. Under a managed floating exchange rate system, the nation's monetary authorities are entrusted with the responsibility of intervening in foreign exchange markets to smooth out these short-run fluctuations without attempting to affect the long-run trend in exchange rates. To the extent that they are successful, the nation receives most of the benefits that result from fixed exchange rates (see Section 20.4) while at the same time retaining flexibility in adjusting balance-of-payments disequilibria.

One possible difficulty is that monetary authorities may be in no better position than professional speculators, investors, and traders to know what the long-run trend in exchange rates is. Fortunately, knowledge of the long-run trend is not needed to stabilize short-run fluctuations in exchange rates if the nation adopts a policy of leaning against the wind. This requires the nation's monetary authorities to supply, out of international reserves, a

portion (but not all) of any short-run excess demand for foreign exchange in the market (thus moderating the tendency of the nation's currency to depreciate) and absorb (and add to its reserves) a portion of any short-run excess supply of foreign exchange in the market (thus moderating the tendency of the nation's currency to appreciate). This reduces short-run fluctuations without affecting the long-run trend in exchange rates.

Note that under a managed float there is still a need for international reserves, whereas under a freely floating exchange rate system, balance-of-payments disequilibria are immediately and automatically corrected by exchange rate changes (with stable foreign exchange markets) without any official intervention and need for reserves. However, the freely floating exchange rate system will experience exchange rate fluctuations that the managed float attempts to moderate.

What proportion of the short-run fluctuation in exchange rates monetary authorities succeed in moderating under a managed floating system depends on what proportion of the short-run excess demand for or supply of foreign exchange they absorb. This, in turn, depends on their willingness to intervene in foreign exchange markets for stabilization purposes and on the size of the nation's international reserves. The larger the nation's stock of international reserves, the greater is the exchange rate stabilization that it can achieve.

There is, however, the danger that if the rules of leaning against the wind discussed earlier are not spelled out precisely (as has been the case since 1973), a nation might be tempted to keep the exchange rate high (i.e., its currency at a depreciated level) to stimulate its exports (this has been precisely the U.S. situation with China since 2005). This is a disguised beggar-thy-neighbor policy and invites retaliation by other nations when they face an increase in their imports and a reduction in their exports. This type of floating is sometimes referred to as dirty floating. Thus, in the absence of clearly defined and adhered-to rules of behavior, there exists the danger of distortions and conflicts that can be detrimental to the smooth flow of international trade and investments.

The world has had a floating exchange rate system of sorts since 1973. To be sure, this system was not deliberately chosen but was imposed by the collapse of the Bretton Woods system under chaotic conditions in foreign exchange markets and unbearable destabilizing speculation. In the early days of the managed floating system, serious attempts were made to devise specific rules for managing the float to prevent dirty floating and the inevitable conflicts that would follow. However, all of these attempts have failed. What is true is that neither the best expectations of those who favored flexible rates in the early 1970s, nor the worst fears of those who opposed flexible rates, have in fact materialized over the past four decades of the managed float. What is also probably true is that no fixed exchange rate system would have survived the great turmoil of the 1970s arising from the sharp increase in petroleum prices and consequent worldwide inflation and recession.

Nevertheless, the large appreciation of the U.S. dollar from 1980 until February 1985 and the equally large depreciation from February 1985 to the end of 1987 clearly indicate that large exchange rate disequilibria can arise and persist over several years under the present managed floating exchange rate system. This has renewed calls for reform of the present international monetary system along the lines of establishing target zones of allowed fluctuations for the leading currencies and for more international cooperation and coordination of policies among the leading nations.

The present system thus exhibits a large degree of flexibility and more or less allows each nation to choose the exchange rate regime that best suits its preferences and circumstances (see Case Study 20-7). In general, large industrial nations and nations suffering

CASE STUDY 20-7 Exchange Rate Arrangements of IMF Members

Table 20.5 gives the distribution of actual (de facto) exchange rate arrangements of the 187 member countries of the International Monetary Fund and three territories: Aruba (Netherlands), Curacao and Saint Maarten (Netherlands), and Hong Kong SAR (China) as of April 30, 2011. The table shows 107 countries (56.4 percent of the total of 190 countries and territories) operated under hard or soft pegged (i.e., some kind of fixed exchange rate system) and 83 countries (43.6 percent of the total) operated with floating or other managed arrangements.

Among the 13 countries with no separate legal tender (hard peg) were Ecuador, El Salvador, and Panama (all three using the dollar); among the 12 countries that have a currency board (also a hard peg) are Bulgaria, Hong Kong SAR, and Lithuania; the 43 countries that have a conventional (soft) peg include Denmark, Jordan, Kuwait, Libya, Morocco, Saudi Arabia, and Venezuela; the 23 countries that have stabilized arrangements (also a soft peg) include Iran, Pakistan, Syria, and the Ukraine; and among the 12 countries with a crawl-like arrangement (also a soft peg) are Argentina, Bangladesh, China, Dominican Republic, and Egypt.

Among the 36 countries that operate under floating are Brazil, Hungary, India, Indonesia, Korea, Mexico, Philippines, Romania, South Africa, Thailand, and Turkey; the 30 countries that operate under free floating include the United States, the 17 members of the European Monetary Union (EMU) or Eurozone, Japan, the United Kingdom, Australia, Canada, Chile, Poland, and Sweden. Thus, we see that there were a wide variety of exchange rate arrangements in existence at the end of April 2011.

TABLE 20.5. Exchange Rate Arrangements of IMF Members as of April 30, 2011

Exchange Rate Arrangements	Number of Countries	Percent
Hard Pegs	**25**	**13.2**
No separate legal tender	13	6.8
Currency board	12	6.3
Soft Pegs	**82**	**43.2**
Conventional peg	43	22.6
Stabilized arrangement	23	12.1
Crawling peg	3	1.6
Crawl-like arrangement	12	6.3
Pegged exchange rate within horizontal bands	1	0.5
Floating	**66**	**34.7**
Floating	36	18.9
Free floating	30	15.8
Residual		
Other managed arrangements	17	8.9
Total	190	100.0

Source: International Monetary Fund, *Annual Report on Exchange Rate Arrangements and Exchange Rate Restrictions 2011* (Washington, D.C.: 2011).

from greater inflationary pressures than the rest of the world have opted for greater exchange rate flexibility than smaller developing nations or highly specialized open economies. Under the 1976 Jamaica Accords (which more or less formally recognized the de facto managed floating system in operation since 1973), a nation may change its exchange rate regime as conditions change, as long as this does not prove disruptive to trade partners and the world economy. (More will be said on this in Chapter 21.) In recent years a near consensus seems to be emerging that nations should only consider and choose between rigidly fixed exchange rates or fairly flexible ones. Intermediate systems are considered less attractive because they are more likely to lead to destabilizing speculation and thus become more easily unsustainable.

20.7 International Macroeconomic Policy Coordination

During recent decades, the world has become much more integrated, and industrial countries have become increasingly interdependent. International trade has grown twice as fast as world output, and the international mobility of financial capital has increased even faster, especially since the early 1970s. Today, the ratio of international trade to GNP in the seven largest industrialized (i.e., G-7) countries is twice as large as in 1960, and the world is rapidly moving toward truly integrated and global international capital markets.

The increased interdependence in the world economy today has sharply reduced the effectiveness of national economic policies and increased their spillover effects on the rest of the world. For example, an easy monetary policy to stimulate the U.S. economy will reduce interest rates in the United States and lead to capital outflows. This undermines some of the expansionary effect of the easy monetary policy in the United States and results in a dollar depreciation (other things being equal). Other nations face a capital inflow and appreciation of their currencies as the direct result of monetary expansion in the United States, and this may undermine their ability to achieve their own specific national objectives. Similarly, an expansionary fiscal policy in the United States will have important spillover effects on the rest of the world (refer to Case Studies 17-6, 18-3, and 18-4).

With increased interdependence, international macroeconomic policy coordination becomes more desirable and essential. Specifically, nations can do better by setting policies cooperatively than by each acting independently. International macroeconomic policy coordination thus refers to the modifications of national economic policies in recognition of international interdependence. For example, with a worldwide recession, each nation may hesitate to stimulate its economy to avoid a deterioration of its trade balance. Through a coordinated simultaneous expansion of all nations, however, output and employment can increase in all nations without any of them suffering a deterioration in their trade balances. Similarly, international policy coordination can avoid competitive devaluations by nations in order to stimulate their exports (beggar-thy-neighbor policies). Competitive devaluations are very likely to lead to retaliation and are self-defeating, and disrupt international trade. This is in fact what occurred during the interwar period (i.e., in the years between World War I and World War II) and was one of the reasons for the establishment of a fixed exchange rate system (the Bretton Woods system) after World War II. This can be regarded as a cooperative agreement to avoid competitive devaluations.

International policy coordination under the present international monetary system has occurred only occasionally and has been limited in scope. One such episode was in 1978 when Germany agreed to serve as "locomotive" for the system (i.e., to stimulate its economy, thereby increasing its imports and thus stimulating the rest of the world). Fearing a resurgence of domestic inflation, however, Germany abandoned its effort before it bore fruit. A more successful episode of limited international policy coordination was the Plaza Agreement of September 1985, under which the G-5 countries (the United States, Japan, Germany, France, and the United Kingdom) agreed to jointly intervene in foreign exchange markets to induce a gradual depreciation or "soft landing" of the dollar in order to eliminate its large overvaluation. A related example of successful but limited international policy coordination was the Louvre Accord in February 1987, which established soft reference ranges or target zones for the dollar-yen and dollar-mark exchange rates. Other examples of successful but limited policy coordination are given by the series of coordinated interest rate cuts engineered by the United States, Japan, and Germany in 1986 and their quick coordinated response to the October 1987 worldwide equity-market crash. There was also some coordinated response after the September 11, 2001, terrorist attacks on the United States and during the 2008–2009 world economic recession.

The above instances of policy coordination were sporadic and limited in scope, however. The coordination process seems also to have deteriorated since 1989. For example, in December 1991, Germany sharply increased interest rates to their highest level since 1948 in order to stem inflationary pressures fueled by the rebuilding of East Germany, in spite of the fact that the United States and the rest of Europe were in or near recession and therefore would have preferred lower interest rates. The United States did in fact lower its interest rate to pull out of its recession, and this led to a sharp depreciation of the dollar vis-à-vis the German mark. The other countries of the EU were instead forced to follow the German lead and raise interest rates in order to keep their exchange rates within the allowed 2.25 percent band of fluctuation, as required by the European Monetary System, and thus had to forgo easy monetary policy to stimulate their weak economies. This total German disregard for the requirements of other leading nations was a serious setback for international monetary cooperation and coordination and led to the serious crisis of the ERM in September 1992 and August 1993 (refer to Section 20.4B).

There are several obstacles to successful and effective international macroeconomic policy coordination. One is the lack of consensus about the functioning of the international monetary system. For example, the U.S. Fed may believe that a monetary expansion would lead to an expansion of output and employment, while the European Central Bank may believe that it will result in inflation. Another obstacle arises from the lack of agreement on the precise policy mix required. For example, different macroeconometric models give widely different results as to the effect of a given fiscal expansion. There is then the problem of how to distribute the gains from successful policy coordination among the participants and how to spread the cost of negotiating and policing agreements. Empirical research reported in *Frenkel, Goldstein, and Masson* (1991) indicates that nations gain from international policy coordination about three-quarters of the time but that the welfare gains from coordination, when they occur, are not very large. These empirical studies, however, may not have captured the full benefits from successful international policy coordination.

SUMMARY

1. While we earlier examined separately the process of adjustment under flexible and fixed exchange rate systems, in this chapter we evaluated and compared the advantages and disadvantages of a flexible as opposed to a fixed exchange rate system, as well as the merits and drawbacks of hybrid systems combining various characteristics of flexible and fixed exchange rates.

2. The case for a flexible exchange rate system rests on its alleged greater market efficiency and its policy advantages. A flexible exchange rate system is said to be more efficient than a fixed exchange rate system because (1) it relies only on changes in exchange rates, rather than on changing all internal prices, to bring about balance-of-payments adjustment; (2) it makes adjustment smooth and continuous rather than occasional and large; and (3) it clearly identifies the nation's degree of comparative advantage and disadvantage in various commodities. The policy advantages of a flexible exchange rate system are (1) it frees monetary policy for domestic goals; (2) it enhances the effectiveness of monetary policy; (3) it allows each nation to pursue its own inflation–unemployment trade-off; (4) it removes the danger that the government will use the exchange rate to reach goals that can be better achieved by other policies; and (5) it eliminates the cost of official interventions in foreign exchange markets.

3. The case for a fixed exchange rate system rests on the alleged lower uncertainty, on the belief that speculation is more likely to be stabilizing, and on fixed rates being less inflationary. However, on both theoretical and empirical grounds, it seems that a flexible exchange rate system does not compare unfavorably with a fixed exchange rate system as far as the type of speculation to which it gives rise. On the other hand, flexible exchange rates are generally more efficient and do give nations more flexibility in pursuing their own stabilization policies, but they are generally more inflationary than fixed exchange rates and less stabilizing and suited for nations facing large internal shocks. They also seem to lead to excessive exchange rate volatility. Be that as it may, policymakers face an open-economy policy trilemma.

4. An *optimum currency area or bloc* refers to a group of nations whose national currencies are linked through permanently fixed exchange rates. This offers important advantages but also leads to some costs for the participating nations. The European Monetary System (EMS) was started in 1979 and involved creating the European Currency Unit (ECU), keeping exchange rates of member countries fluctuating within a 2.25 percent band, and establishing the European Monetary Cooperation Fund (EMCF) to provide members with short- and medium-term balance-of-payments assistance. In June 1989, a committee headed by Jacques Delors, the president of the European Commission, recommended a three-stage transition to the goal of monetary union, with a single currency and a European Central Bank (ECB) by 1997 or 1999. In September 1992, the United Kingdom and Italy dropped out of the exchange rate mechanism and the band of allowed fluctuation was increased to ± 15 percent. On January 1, 1999, 11 of the then 15 members of the European Union (EU) formed the European Monetary Union (EMU) with the adoption of the euro as their common currency and with the European Central Bank (ECB) responsible for unionwide monetary policy in the eurozone. By 2011, 17 EU nations had adopted the euro.

5. Under currency board arrangements (CBAs), the nation rigidly fixes the exchange rate and its central bank loses control over the nation's money supply or its ability to conduct an independent monetary policy or be the lender of last resort. With a CBA the nation's money supply increases or decreases, respectively, only in response to a balance-of-payments surplus or to a balance-of-payments deficit. The main advantage of CBAs is the credibility of the economic policy regime and lower interest rates and inflation. Dollarization refers to a nation adopting the currency of another nation (most often the dollar) as its legal tender. The benefits and costs of dollarization are similar to those arising from adopting a CBA, only they are more pronounced because the nation gives up its "exit option."

6. Most exchange rate systems usually allow the exchange rate to fluctuate within narrowly defined

limits. An adjustable peg system would require nations periodically to change their exchange rates when in balance-of-payments disequilibrium. The disadvantage of an adjustable peg system is that it may lead to destabilizing speculation. This can be overcome by a crawling peg system wherein par values are changed by small amounts at frequent specified intervals. Half of the 185 members of the International Monetary Fund operated under a fixed exchange rate system of some type, while the other half had some exchange rate flexibility in 2011.

7. During recent decades, the world has become increasingly interdependent. This has made international policy coordination more desirable and essential. International policy coordination under the present international monetary system has occurred only occasionally and has been limited in scope. The obstacles arise because of the lack of consensus about the functioning of the international monetary system, lack of agreement on the precise policy mix required, and difficulty in agreeing on how to distribute the gains from successful policy coordination among the participants and how to spread the cost of negotiating and policing agreements. Empirical research indicates that the welfare gains from coordination, when they occur, are not very large.

A LOOK AHEAD

In Chapter 21 (the last chapter in the book), we examine the operation of the international monetary system from the gold standard period to the present. Fragments of this experience were presented as examples as the various mechanisms of balance-of-payments adjustment were examined in previous chapters. However, in Chapter 21, we will bring it all together and evaluate the process of balance-of-payments adjustment as it actually occurred under the various international monetary systems that existed from 1880 through 2011. We also indicate how the international economic problems facing the world today, which were identified in Chapter 1, might be solved.

KEY TERMS

Adjustable peg system, p. 668
Crawling peg system, p. 670
Currency board arrangements (CBAs), p. 665
Dirty floating, p. 671
Dollarization, p. 666
Euro, p. 660
European Central Bank (ECB), p. 663
European Currency Unit (ECU), p. 657
European Monetary Cooperation Fund (EMCF), p. 657
European Monetary Institute (EMI), p. 659
European Monetary System (EMS), p. 657
European Monetary Union (EMU), p. 660
Exchange Rate Mechanism (ERM), p. 658
Freely floating exchange rate system, p. 648
International macroeconomic policy coordination, p. 673
Leaning against the wind, p. 670
Maastricht Treaty, p. 659
Managed floating exchange rate system, p. 670
Optimum currency area or bloc, p. 656
Stability and Growth Pact (SGP), p. 659
Trilemma, p. 654

QUESTIONS FOR REVIEW

1. How does a flexible exchange rate system in general adjust balance-of-payments disequilibria? How does a fixed exchange rate system in general adjust balance-of-payments disequilibria? Why is the choice between these two basic types of adjustment systems important?

2. What are the two main types of advantage of a flexible as opposed to a fixed exchange rate system? What are the specific advantages subsumed under each main type of advantage of a flexible exchange rate system?

3. What are the alleged advantages of a fixed over a flexible exchange rate system? How would the advocates of flexible exchange rates reply?
4. On the basis of the theoretical and empirical evidence available, indicate what overall conclusion can be reached on whether a flexible or a fixed exchange rate system is preferred.
5. What is meant by an optimum currency area or bloc?
6. What are the main advantages and disadvantages of an optimum currency area? What are the conditions required for the establishment of an optimum currency area?
7. What is meant by the European Monetary System? How has it functioned since its establishment? What is the European Monetary Union? the euro? What is the function of the European Central Bank?
8. What is meant by currency board arrangements? dollarization? Why would a nation adopt one or the other? How does each operate? What are the benefits and costs of each?
9. What is the effect of increasing the allowed band of exchange rate fluctuation under a fixed exchange rate system?
10. What is meant by an adjustable peg system? What are the advantages and disadvantages of an adjustable peg system with respect to a system of permanently fixed exchange rates?
11. What is meant by a crawling peg system? How can such a system overcome the disadvantage of an adjustable peg system?
12. What is meant by a managed floating exchange rate system? How does the policy of leaning against the wind operate? What is the advantage of a managed floating system with respect to a freely floating exchange rate system and a fixed exchange rate system?
13. What is meant by dirty floating? How well is the present managed floating system operating?
14. What is meant by international macroeconomic policy coordination? Why is it needed? How does it operate?
15. How large are the potential benefits from greater macroeconomic policy coordination? How likely is it that we will see much greater macroeconomic policy coordination among the leading industrial nations in the foreseeable future?

PROBLEMS

*1. Suppose that the price of a commodity is \$3.50 in the United States and €4 in the European Monetary Union and the actual exchange rate between the dollar and the euro is $R = \$1/€1$, but, the equilibrium exchange rate $R' = \$0.75/€1$.

(a) Will the United States import or export this commodity?

(b) Does the United States have a comparative advantage in this commodity?

*2. Explain why monetary policy would be completely ineffective under a fixed exchange rate system and perfectly elastic international capital flows.

3. Draw a figure similar to Figure 20.1, but showing that for given shifts in the nation's supply curve of foreign exchange, the exchange rate would fluctuate less when the demand for foreign exchange is elastic than when it is inelastic.
4. Draw a figure similar to Figure 20.2 showing the fluctuation in the exchange rate over the business cycle without speculation, with stabilizing speculation, and with destabilizing speculation when there is no long-run trend in the exchange rate over the cycle.
5. Do the same as in Problem 4 but assuming an implicit appreciating trend of the dollar over the business cycle.

*6. Explain the difference between an optimum currency area and a fixed exchange rate system.

*= Answer provided at www.wiley.com/college/salvatore.

7. Explain why (a) a single central bank and currency for the countries of the European Union mean that its members can no longer have an independent monetary policy and (b) there is no such thing as an exchange rate among member nations.

8. Indicate the benefits and costs that are likely to arise for the EU member countries from the establishment of a single currency.

9. Indicate the difference among

(a) a fixed exchange rate system,

(b) a currency board arrangement, and

(c) dollarization.

10. Starting with the exchange rate of $R = \$2/€1$, draw a figure showing the exchange rate under a crawling peg system with the nation appreciating its currency by 1 percent at the end of each month for three months, with an allowed band of fluctuation of 1 percent above and below the par value.

11. Starting with the solid line (curve *A*) showing the fluctuation in the exchange rate over the business cycle in the absence of speculation in Figure 20.2, draw a figure showing the fluctuation in the exchange rate over the cycle (under a managed floating exchange rate system and no speculation) with a policy of leaning against the wind that eliminates about one-half of the fluctuation in the exchange rate.

12. A flexible exchange rate system will insulate the economy from international disturbance and therefore eliminate the need for international policy coordination. True or false? Explain.

13. Explain how game theory can be used to examine international macroeconomic policy coordination.

14. Explain why each nation might pursue a loose fiscal policy and a tight monetary policy in the absence of international policy coordination but the opposite with policy coordination.

15. **(a)** Review the experience with international macroeconomic policy coordination among the leading industrial countries during the past two decades.

(b) What conclusion can you reach regarding the possibility of much greater international macroeconomic policy coordination among the leading industrial countries of the world today?

APPENDIX

A20.1 Exchange Rate Arrangements

In this appendix, we present the exchange rate arrangements, as of April 30, 2011, of the 187 countries and three territories that are members of the International Monetary Fund. This is shown in Table 20.6 on the following three pages. The table shows that the present system exhibits a large degree of freedom for each nation to choose the exchange regime that best suits it. As a result, some have referred to the present system as a nonsystem. A nation may also change its exchange regime as long as the change is not disruptive to its trade partners and to the world economy.

Problem What kind of exchange rate arrangement did the nations of the European Union adopt on January 1, 1999?

TABLE 20.6. De Facto Classification of Exchange Rate Arrangements and Monetary Policy Framework, April 30, 2011

Exchange Rate arrangement (number of countries)	Monetary Policy Framework								
	Exchange Rate Anchor						Monetary aggregate target (29)	Inflation-targeting framework (31)	Other[1] (33)
	U.S. dollar (48)		Euro (27)		Composite (14)	Other (8)			
No separate legal tender (13)	Ecuador El Salvador Marshall Islands Micronesia, Fed. States of	Palau Panama Timor-Leste Zimbabwe (01/10)	Kosovo Montenegro	San Marino		Kiribati Tuvalu			
Currency board (12)	ECCU Antigua and Barbuda Dominica Grenada St. Kitts and Nevis St. Lucia	St. Vincent and the Grenadines Djibouti Hong Kong SAR	Bosnia and Herzegovina Bulgaria	Lithuania[2]		Brunei Darussalam			
Conventional peg (43)	Aruba Bahamas, The Bahrain Barbados Belize Curaçao and Sint Maarten Eritrea	Jordan Oman Qatar Saudi Arabia Turkmenistan United Arab Emirates Venezuela	Cape Verde Comoros Denmark[2] Latvia[2] São Tomé and Príncipe (01/10) WAEMU Benin Burkina Faso Côte d'Ivoire Guinea-Bissau Mali Niger	Senegal Togo CAEMC Cameroon Central African Rep. Chad Congo, Rep. of Equatorial Guinea Gabon	Fiji, Rep. of Kuwait Libya Morocco[3] Samoa	Bhutan Lesotho Namibia Nepal Swaziland			

(continued)

■ TABLE 20.6. Continued

Exchange Rate arrangement (number of countries)	Monetary Policy Framework							
	Exchange Rate Anchor					Monetary aggregate target (29)	Inflation-targeting framework (31)	Other[1] (33)
	U.S. dollar (48)		Euro (27)	Composite (14)	Other (8)			
Stabilized arrangement (23)	Cambodia Guyana Honduras Iraq Jamaica Lao Peoples Dem. Rep. Lebanon	Malawi[4] (02/10) Maldives (04/11) Suriname Trinidad and Tobago Vietnam	Macedonia	Belarus (05/10) Iran, Islamic Rep. of Syrian Arab Rep. Tunisia		Burundi[5] Pakistan[5] (06/10) Tajikistan[5] Ukraine[4, 5] (03/10)		Azerbaijan[5] Bolivia[5]
Crawling peg (3)	Nicaragua			Botswana		Uzbekistan[5]		
Crawl-like arrangement (12)	Ethiopia Kazakhstan		Croatia (06/10)			Argentina[4,5] (01/10) Bangladesh[5] (10/10) Congo, Dem. Rep. of[5] (05/10) China[5] (06/10) Dominican Rep.[4,5] (02/10) Rwanda[4,5] (01/10) Sri Lanka[4,5] (03/10)		Egypt[4,6] (03/09) Haiti[4,5] (03/10)

Pegged exchange rate within horizontal bands (1)			Tonga		
Other managed arrangement (17)	Angola Liberia Sudan[4] (12/09)		Algeria Singapore Vanuatu	Guinea Nigeria Paraguay Solomon Islands (02/11) Yemen, Rep. of	Costa Rica Kyrgyz Rep. Malaysia Mauritania Myanmar Russian Federation
Floating (36)				Afghanistan, Islamic Rep. of (04/11) Gambia, The Kenya Madagascar Mongolia Mozam-bique Papua New Guinea Seychelles Sierra Leone Tanzania Uganda Zambia	Albania Armenia[6] Brazil Colombia Georgia[4,7] (01/10) Ghana Guatemala Hungary Iceland Indonesia (02/11) Israel Korea, Rep. of Mexico Moldova Peru (04/11) Philippines Romania Serbia South Africa Thailand Turkey (10/10) Uruguay	India Mauritius (07/10)

(continued)

TABLE 20.6. Continued

Exchange Rate arrangement (number of countries)	Monetary Policy Framework						
	Exchange Rate Anchor				Monetary aggregate target (29)	Inflation-targeting framework (31)	Other[1] (33)
	U.S. dollar (48)	Euro (27)	Composite (14)	Other (8)			
Free floating (30)						Australia Canada Chile Czech Rep. New Zealand Norway Poland Sweden United Kingdom	Japan Somalia Switzerland (06/10) United States EMU Austria Belgium Cyprus Estonia (01/11) Finland France Germany Greece Ireland Italy Luxembourg Malta Netherlands Portugal Slovak Republic Slovenia Spain

Note: If the member country's de facto exchange rate arrangement has been reclassified during the reporting period, the date of change is indicated in parentheses.
[1]Includes countries that have no explicitly stated nominal anchor, but rather monitor various indicators in conducting monetary policy.
[2]The member participates in the European Exchange Rate Mechanism (ERM II).
[3]Within the framework of an exchange rate fixed to a currency composite, the Bank Al-Maghrib (BAM) adopted a monetary policy framework in 2006 based on various inflation indicators with the overnight interest rate as its operational target to pursue its main objective of price stability. Since March 2009, the BAM reference interest rate has been set at 3.25%.
[4]The exchange rate arrangement was reclassified retroactively, overriding a previously published classification.
[5]The de facto monetary policy framework is an exchange rate anchor to the U.S. dollar.
[6]The de facto monetary policy framework is an exchange rate anchor to a composite.
[7]The central bank has taken preliminary steps toward inflation targeting and is preparing for the transition to full-fledged inflation targeting.
Source: IMF staff.

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INTERNet

The International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD), and the Bank for International Settlements (BIS) regularly review the monetary, fiscal, and exchange rate policies of various nations and other economic units and post many of their results on their web sites, which are:

http://www.imf.org

http://www.oecd.org

http://www.bis.org

The central banks of the leading nations (the Board of Governors of the Federal Reserve Bank and the Federal Reserve Bank of New York for the United States and the European Central Bank for the European Monetary Union) include on their web sites a great deal of information on national economic and financial policies. The web sites for the United States, the European Union, the Bank of England, the Bank of Japan, and the Bank of Canada are:

http://www.federalreserve.gov/policy.htm

http://www.newyorkfed.org/index.html

http://www.ecb.int

http://www.bankofengland.co.uk

http://www.boj.or.jp/en/index.htm

http://www.bankofcanada.ca/en/index.html

The link to most of the worlds' central banks is found on the web site of the Bank for International Settlements (BIS) at:

http://www.bis.org/cbanks.htm

Analyses of monetary and other economic policies of the leading nations are also provided in *The Economic Report of the President*, The Federal Reserve Bank of St. Louis, the European Commission (EC), National Bureau of Economic Research (NBER), and Institute for International Economics (IIE). The web sites for these organizations are:

http://www.gpoaccess.gov/eop

http://www.stls.frb.org

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