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.

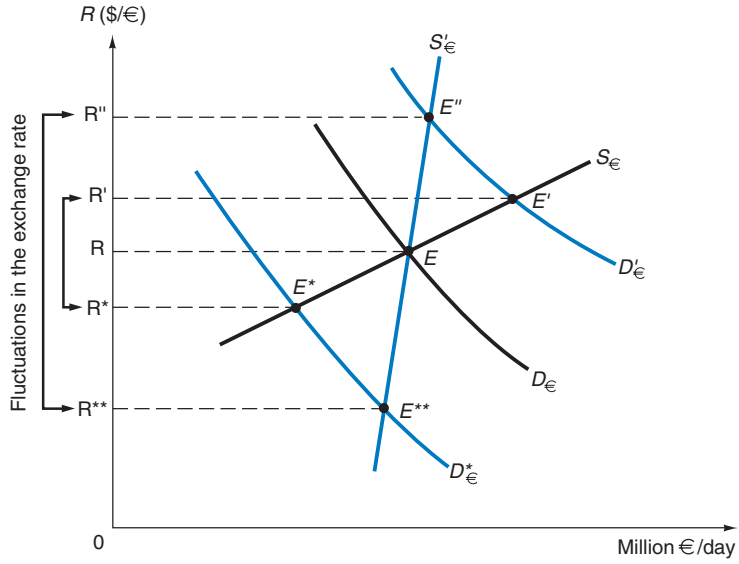

FIGURE 20.1. Shifts in the Nation's Demand Curve for Foreign Exchange and Uncertainty.
The shift over time in the U.S. demand curve for euros from the average $D_{€}$ to $D'_{€}$ and then to $D^*_{€}$ causes the exchange rate to fluctuate from R' to R^* when the U.S. supply curve of euros is $S_{€}$,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

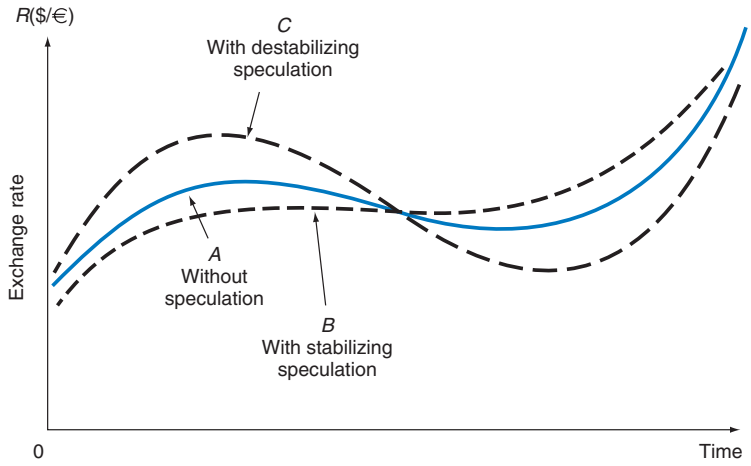

FIGURE 20.2. Fluctuations in Exchange Rate in the Absence of Speculation and with Stabilizing and Destabilizing Speculation.
Curve *A* shows the fluctuation in the exchange rate over the business cycle in the absence of speculation. Curve *B* shows the smaller fluctuation in the exchange rate with stabilizing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

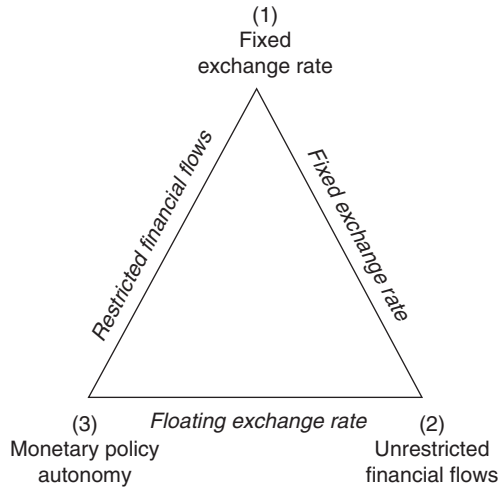

FIGURE 20.3. The Policy Trilemma for Open Economies.
Each corner of the triangle shows one policy choice open to the nation. The nation can attain only two of the three.

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

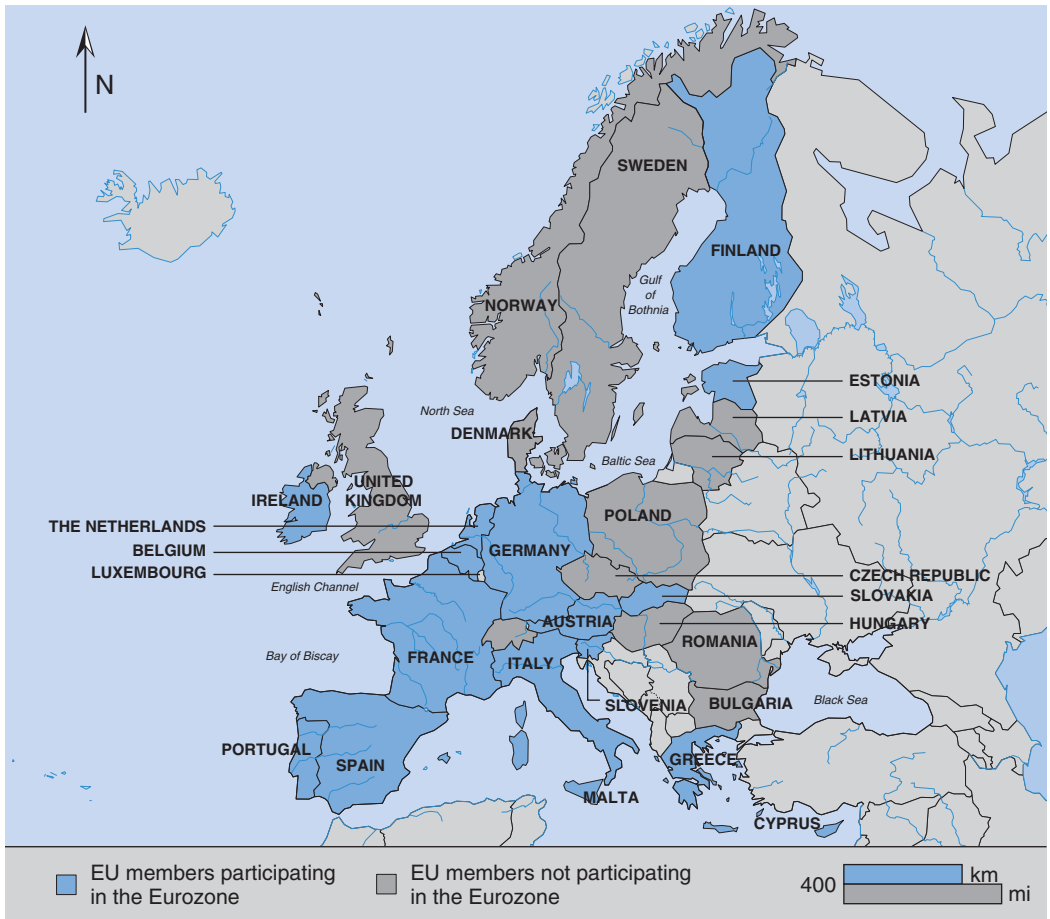

FIGURE 20.4. **The Eurozone Countries as of the Beginning of 2012.**
As of the beginning of 2012, the 17 members of the Eurozone were Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain.

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.

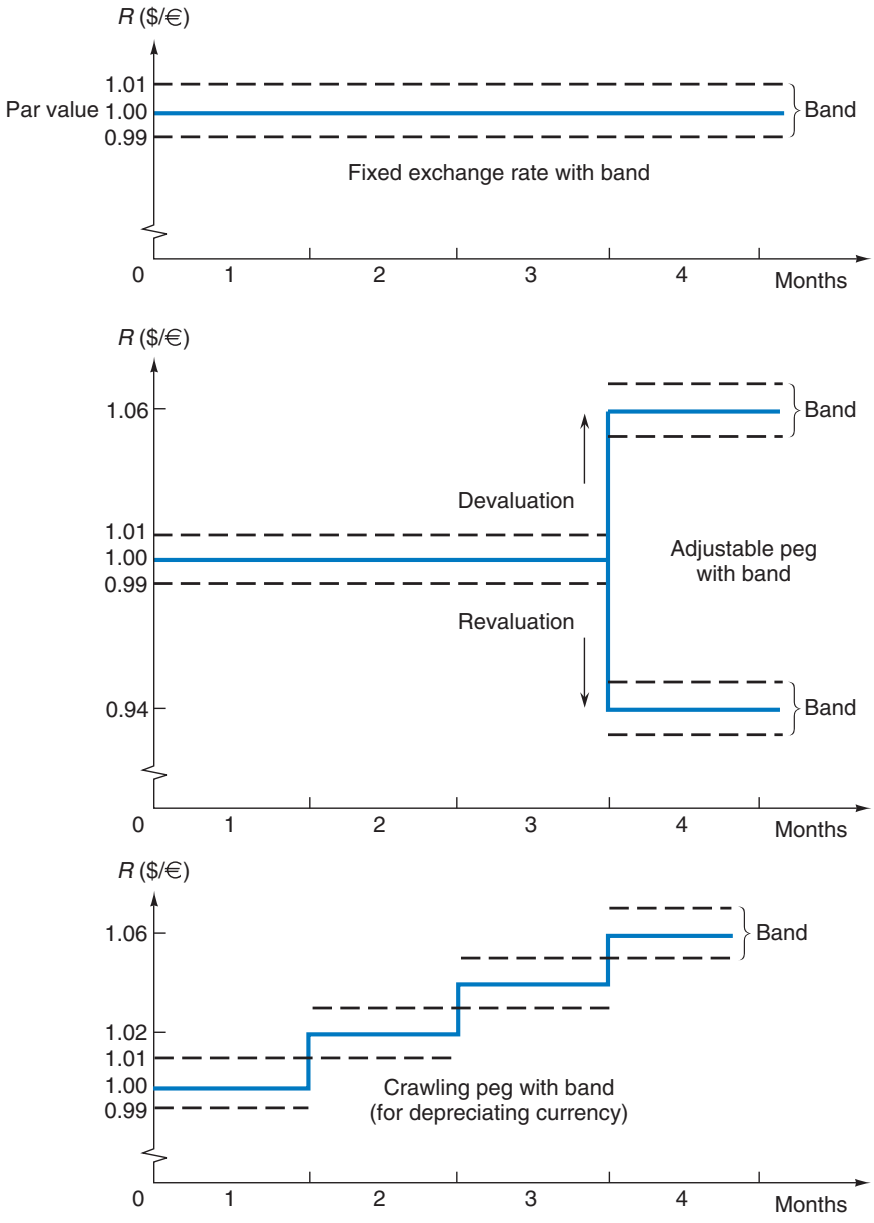

FIGURE 20.5. Exchange Rate Band, Adjustable Pegs, and Crawling Pegs.
In the top panel, the par value is R = \$1/€1, and the exchange rate is allowed to fluctuate by 1 percent above and below the par value established. The middle panel shows the nation devaluating its currency from R = \$1.00 to R = \$1.06 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

http://europa.eu

http://nber.org

http://www.iie.com

chapter

21

The International Monetary System: Past, Present, and Future

LEARNING GOALS:

After reading this chapter, you should be able to:

- Understand how the gold standard operated
- Describe how the postwar Bretton Woods System operated and why it collapsed
- Know how the present international monetary system works
- Identify the major international economic problems facing the world today

21.1 Introduction

In this chapter, 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 when the various mechanisms of balance-of-payments adjustment were examined. We now bring it all together and evaluate the process of balance-of-payments adjustment and, more broadly, open-economy macroeconomic policies and performance as they actually occurred under the various international monetary systems that existed from 1880 to the present. Although the approach is historical, the evaluation of the operation of the various international monetary systems will be conducted in terms of the analytical framework developed in Chapters 16 through 20.

An international monetary system (sometimes referred to as an international monetary *order* or *regime*) refers to the rules, customs, instruments, facilities, and organizations for effecting international payments. International monetary systems can be classified according to the way in which exchange rates are determined or according to the form that international reserve assets take. Under the exchange rate classification, we can have a fixed exchange rate system with a narrow band of fluctuation about a par value, a fixed exchange rate system with a wide band of fluctuation, an adjustable peg system, a crawling peg system, a managed floating exchange rate system, or a freely floating exchange rate system. Under the

international reserve classification, we can have a gold standard (with gold as the only international reserve asset), a pure fiduciary standard (such as a pure dollar or exchange standard without any connection with gold), or a gold-exchange standard (a combination of the previous two).

The various classifications can be combined in various ways. For example, the gold standard is a fixed exchange rate system. However, we can also have a fixed exchange rate system without any connection with gold, but with international reserves comprised of some national currency, such as the U.S. dollar, that is no longer backed by gold. Similarly, we can have an adjustable peg system or a managed float with gold and foreign exchange or with only foreign exchange as international reserves. Under a freely floating exchange rate system, there is theoretically no need for reserves since exchange rate changes automatically and immediately correct any balance-of-payments disequilibrium as it develops. Throughout the period of our analysis, most of the international monetary systems possible were in operation at one time or another or for some nations, as described in this chapter.

A good international monetary system is one that maximizes the flow of international trade and investments and leads to an "equitable" distribution of the gains from trade among the nations of the world. An international monetary system can be evaluated in terms of adjustment, liquidity, and confidence. Adjustment refers to the process by which balance-of-payments disequilibria are corrected. A good international monetary system is one that minimizes the cost of and the time required for adjustment. Liquidity refers to the amount of international reserve assets available to settle temporary balance-of-payments disequilibria. A good international monetary system is one that provides adequate international reserves so that nations can correct balance-of-payments deficits without deflating their own economies or being inflationary for the world as a whole. Confidence refers to the knowledge that the adjustment mechanism is working adequately and that international reserves will retain their absolute and relative values.

In Section 21.2, we examine the gold standard as it operated from about 1880 to 1914 and the experience between World War I and World War II. The gold standard was a fixed exchange rate system with gold as the only international reserve asset. The interwar period was characterized first by a system of flexible exchange rates and subsequently by the attempt to reestablish the gold standard—an attempt doomed to failure. Sections 21.3, 21.4, and 21.5 examine the establishment, operation, and collapse of the Bretton Woods system, the fixed or adjustable peg gold-exchange standard that operated from the end of World War II until August 1971. From then through March 1973, an adjustable peg dollar standard prevailed. Section 21.6 examines the operation of and the problems facing the present managed floating exchange rate system. Finally, the appendix presents the composition and value of international reserves from 1950 to 2011.

21.2 The Gold Standard and the Interwar Experience

In this section, we examine first the gold standard as it operated from about 1880 to the outbreak of World War I in 1914. Then we examine the interwar experience with flexible exchange rates between 1919 and 1924 and the subsequent attempt to reestablish the gold standard. (This attempt failed with the deepening of the Great Depression in 1931.)

21.2A The Gold Standard Period (1880–1914)

The *gold standard* operated from about 1880 to 1914. Under this standard, as explained in Section 16.6A, each nation defined the gold content of its currency and passively stood ready to buy or sell any amount of gold at that price. Since the gold content in one unit of each currency was fixed, exchange rates were also fixed. This was called the *mint parity*. The exchange rate could then fluctuate above and below the mint parity (i.e., within the *gold points*) by the cost of shipping an amount of gold equal to one unit of the foreign currency between the two monetary centers.

The exchange rate was determined within the gold points by the forces of demand and supply and was prevented from moving outside the gold points by gold shipments. That is, the tendency of a currency to depreciate past the *gold export point* was halted by gold outflows from the nation. These gold outflows represented the deficit in the nation's balance of payments. Conversely, the tendency of a nation's currency to appreciate past the *gold import point* was halted by gold inflows. These gold inflows measured the surplus in the nation's balance of payments. Since deficits were supposed to be settled in gold and nations had limited gold reserves, deficits could not go on forever but had to be corrected quickly.

The adjustment mechanism under the gold standard, as explained by *Hume*, was the automatic *price-specie-flow mechanism* (see Section 16.6B), which operated as follows. Since each nation's money supply consisted of either gold itself or paper currency backed by gold, the money supply would fall in the deficit nation and rise in the surplus nation. This would cause internal prices to fall in the deficit nation and rise in the surplus nation (the *quantity theory of money*). As a result, the exports of the deficit nation would be encouraged and its imports discouraged until its balance-of-payments deficit was eliminated. The opposite would occur in the surplus nation.

Passively allowing its money supply to change for balance-of-payments considerations meant that a nation could not use monetary policy for achieving full employment without inflation. But this created no difficulties for classical economists, since they believed that there was an automatic tendency in the economic system toward full employment without inflation.

For the adjustment process to operate, nations were not supposed to *sterilize* (i.e., neutralize) the effect of a balance-of-payments deficit or surplus on the nation's money supply. On the contrary, the *rules of the game* of the gold standard required a deficit nation to reinforce the adjustment process by further restricting credit and a surplus nation to further expand credit. However, *Nurkse and Bloomfield* found that monetary authorities often did not follow the rules of the game during the period of the gold standard but sterilized part, though not all, of the effect of a balance-of-payments disequilibrium on the nation's money supply. *Michaely* argued that this was necessary to moderate the adjustment process and prevent an excessive reduction in the deficit nation's money supply and an excessive increase in the surplus nation's money supply.

This is how the adjustment mechanism was supposed to have worked under the gold standard. In reality, *Taussig* and some of his students at Harvard found in the 1920s that the adjustment process seemed to work much too quickly and smoothly and with little, if any, actual transfers of gold among nations. Taussig found that balance-of-payments disequilibria were settled mostly by international capital flows rather than through gold shipments (as described above). That is, when the United Kingdom had a balance-of-payments deficit,

its money supply fell, interest rates rose, and this attracted a short-term capital inflow to cover the deficit.

The United Kingdom reinforced this incentive for capital inflows by deliberately raising its discount rate (called the *bank rate* then), which increased interest rates and capital inflows even more. Furthermore, the reduction in the U.K. money supply as a result of a deficit seems to have reduced domestic economic activity more than prices, and this discouraged imports (as described by the automatic *income* adjustment mechanism discussed in Chapter 17). The opposite process corrected a surplus in the U.K. balance of payments.

Not only did most of the adjustment under the gold standard not take place as described by the price-specie-flow mechanism, but if the adjustment process was quick and smooth, this was due to the special conditions that existed during the period of the gold standard. This was a period of great economic expansion and stability throughout most of the world. The pound sterling was the only important international currency and London the only international monetary center. Therefore, there could be no lack of confidence in the pound and shifts into other currencies and to other rival monetary centers. There was greater price flexibility than today, and nations subordinated internal to external balance. Under such circumstances, any international monetary system would probably have worked fairly smoothly.

Reestablishing the gold standard today without at the same time recreating the conditions that ensured its smooth operation during the 30 years or so before World War I would certainly lead to its collapse. Nevertheless, the period of the gold standard is surrounded by an aura of nostalgia about "the good old days" that is difficult to dispel and that to some extent lingers on even today. However, it is improbable that the gold standard or anything closely resembling it will be reestablished in the foreseeable future.

21.2B The Interwar Experience

With the outbreak of World War I, the classical gold standard came to an end. Between 1919 and 1924, exchange rates fluctuated wildly, and this led to a desire to return to the stability of the gold standard. In April 1925, the United Kingdom reestablished the convertibility of the pound into gold *at the prewar price* and lifted the embargo on gold exports that it had imposed at the outbreak of World War I. Other nations followed the United Kingdom's lead and went back to gold. (The United States had already returned to gold in 1919.) However, the new system was more in the nature of a gold-exchange standard than a pure gold standard in that both gold and currencies convertible into gold (mostly pounds but also U.S. dollars and French francs) were used as international reserves. This economized on gold, which (at the prewar price and in the face of a substantial increase in other prices as a result of the war) had become a much smaller percentage of the total value of world trade.

Since the United Kingdom had lost a great deal of its competitiveness (especially to the United States) and had liquidated a substantial portion of its foreign investments to pay for the war effort, reestablishing the prewar parity left the pound grossly overvalued (see the discussion of Cassell's purchasing-power theory in Section 15.2). This led to balance-of-payments deficits and to deflation as the United Kingdom attempted to contain its deficits. On the other hand, France faced large balance-of-payments surpluses after the franc was stabilized at a depreciated level in 1926.

Seeking to make Paris an international monetary center in its own right, France passed a law in 1928 requiring settlement of its balance-of-payments surpluses in gold rather than in

pounds or other currencies. This was a serious drain on the meager U.K. gold reserves and led to a shift of short-term capital from London to Paris and New York. When France also sought to convert all of its previously accumulated pounds into gold, the United Kingdom was forced in September 1931 to suspend the convertibility of the pound into gold, which devalued the pound, and the gold-exchange standard came to an end. (The United States actually went off gold in 1933.)

While France's decision to convert all of its pounds into gold was the immediate cause of the collapse of the gold-exchange standard, the more fundamental causes were (1) the lack of an adequate adjustment mechanism as nations sterilized the effect of balance-of-payments disequilibria on their money supplies in the face of grossly inappropriate parities, (2) the huge destabilizing capital flows between London and the emerging international monetary centers of New York and Paris, and (3) the outbreak of the Great Depression (to which the malfunction of the international monetary system contributed). However, it is likely that any international monetary system would have collapsed under the tremendous strain of worldwide depression.

There followed, from 1931 to 1936, a period of great instability and competitive devaluations as nations tried to "export" their unemployment. The United States even devalued the dollar (by increasing the dollar price of gold from $20.67 to $35 an ounce) in 1933–1934, from a position of balance-of-payments *surplus*, in order to stimulate its exports. Needless to say, this was a serious policy mistake. Expansionary domestic policies would have stimulated the U.S. economy and at the same time corrected or reduced its balance-of-payments surplus. By 1936, exchange rates among the major currencies were approximately the same as they had been in 1930, before the cycle of competitive devaluations began. The only effect was that the value of gold reserves was increased. However, most foreign exchange reserves had been eliminated by mass conversions into gold as protection against devaluations.

This was also a period when nations imposed very high tariffs and other serious import restrictions, so that international trade was cut almost in half. For example, in 1930 the United States passed the *Smoot–Hawley Tariff Act*, which raised U.S. import duties to an all-time high (see Section 9.6A). By 1939, of course, depression gave way to full employment—and war.

According to *Nurkse*, the interwar experience clearly indicated the prevalence of destabilizing speculation and the instability of flexible exchange rates. This experience strongly influenced the Allies at the close of World War II to establish an international monetary system with some flexibility but with a heavy emphasis on fixity as far as exchange rates were concerned. (This is discussed in the next section.) More recently, the interwar experience has been reinterpreted to indicate that the wild fluctuations in exchange rates during the 1919–1924 period reflected the serious pent-up disequilibria that had developed during World War I and the instability associated with postwar reconstruction, and that in all likelihood no fixed exchange rate system could have survived during this period.

21.3 The Bretton Woods System

In this section, we describe the Bretton Woods system and the International Monetary Fund (the institution created to oversee the operation of the new international monetary system and provide credit to nations facing temporary balance-of-payments difficulties).

21.3A The Gold-Exchange Standard (1947–1971)

In 1944, representatives of the United States, the United Kingdom, and 42 other nations met at Bretton Woods, New Hampshire, to decide on what international monetary system to establish after the war. The system devised at Bretton Woods called for the establishment of the International Monetary Fund (IMF) for the purposes of (1) overseeing that nations followed a set of agreed upon rules of conduct in international trade and finance and (2) providing *borrowing* facilities for nations in *temporary* balance-of-payments difficulties.

The new international monetary system reflected the plan of the American delegation, drawn up by *Harry D. White* of the U.S. Treasury, rather than the plan submitted by *John Maynard Keynes*, who headed the British delegation. Keynes had called for the establishment of a *clearing union* able to *create* international liquidity based on a new unit of account called the "bancor," just as a national central bank (the Federal Reserve in the United States) can create money domestically. The IMF opened its doors on March 1, 1947, with a membership of 30 nations. With the admission of the Soviet Republics and other nations during the 1990s, IMF membership reached 187 at the beginning of 2012. Only a few countries, such as Cuba and North Korea, are not members.

The Bretton Woods system was a gold-exchange standard. The United States was to maintain the price of gold fixed at $35 per ounce and be ready to exchange on demand dollars for gold at that price without restrictions or limitations. Other nations were to fix the price of their currencies in terms of dollars (and thus implicitly in terms of gold) and intervene in foreign exchange markets to keep the exchange rate from moving by more than 1 percent above or below the par value. Within the allowed band of fluctuation, the exchange rate was determined by the forces of demand and supply.

Specifically, a nation would have to draw down its dollar reserves to purchase its own currency in order to prevent it from depreciating by more than 1 percent from the agreed par value, or the nation would have to purchase dollars with its own currency (adding to its international reserves) to prevent an appreciation of its currency by more than 1 percent from the par value. Until the late 1950s and early 1960s, when other currencies became fully convertible into dollars, the U.S. dollar was the only intervention currency, so that the new system was practically a gold-dollar standard.

Nations were to finance temporary balance-of-payments deficits out of their international reserves and by borrowing from the IMF. Only in a case of fundamental disequilibrium was a nation allowed, after the approval of the Fund, to change the par value of its currency. Fundamental disequilibrium was nowhere clearly defined but broadly referred to large and persistent balance-of-payments deficits or surpluses. Exchange rate changes of less than 10 percent were, however, allowed without Fund approval. Thus, the Bretton Woods system was in the nature of an adjustable peg system, at least as originally conceived, combining general exchange rate stability with some flexibility. The stress on fixity can best be understood as resulting from the strong desire of nations to avoid the chaotic conditions in international trade and finance that prevailed during the interwar period.

After a period of transition following the war, nations were to remove all restrictions on the full convertibility of their currencies into other currencies and into the U.S. dollar. Nations were forbidden to impose additional trade restrictions (otherwise currency convertibility would not have much meaning), and existing trade restrictions were to be removed gradually in multilateral negotiations under the sponsorship of GATT (see Section 9.6B).

Restrictions on international liquid capital flows were, however, permitted to allow nations to protect their currencies against large destabilizing, or "hot," international money flows.

Borrowing from the Fund (to be described below) was restricted to cover temporary balance-of-payments deficits and was to be repaid within three to five years so as not to tie up the Fund's resources in long-term loans. *Long-run* development assistance was to be provided by the International Bank for Reconstruction and Development (IBRD or World Bank) and its affiliates, the International Finance Corporation (established in 1956 to stimulate *private* investments in developing nations from indigenous and foreign sources) and the International Development Association (established in 1960 to make loans at subsidized rates to the poorer developing nations).

The Fund was also to collect and propagate balance-of-payments, international trade, and other economic data of member nations. Today the IMF publishes, among other things, *International Financial Statistics* and *Direction of Trade Statistics*, the most authoritative sources of comparable time series data on the balance of payments, trade, and other economic indicators of member nations.

21.3B Borrowing from the International Monetary Fund

Upon joining the IMF, each nation was assigned a quota based on its economic importance and the volume of its international trade. The size of a nation's quota determined its voting power and its ability to borrow from the Fund. The total subscription to the Fund was set in 1944 at $8.8 billion. As the most powerful nation, the United States was assigned by far the largest quota, 31 percent. Every five years, quotas were to be revised to reflect changes in the relative economic importance and international trade of member nations. At the end of 2011, the total subscription of the Fund had grown to 238.0 billion SDRs ($369.2 billion) through increases in membership and periodic increases in quotas. The U.S. quota had declined to 16.80 percent of the total, the quotas of Japan and Germany were, respectively, 6.25 and 5.83, and that of France and the United Kingdom was 4.30 percent. China, with 10.0 percent of the global economy, had a quota of 3.82 percent.

Upon joining the IMF, a nation was to pay 25 percent of its quota to the Fund in gold and the remainder in its own currency. In borrowing from the Fund, the nation would get convertible currencies approved by the Fund in exchange for depositing equivalent (and additional) amounts of its own currency into the Fund, until the Fund held no more than 200 percent of the nation's quota in the nation's currency.

Under the original rules of the Fund, a member nation could borrow no more than 25 percent of its quota in any one year, up to a total of 125 percent of its quota over a five-year period. The nation could borrow the first 25 percent of its quota, the gold tranche, almost automatically, without any restrictions or conditions. For further borrowings (in subsequent years), the credit tranches, the Fund charged higher and higher interest rates and imposed more and more supervision and conditions to ensure that the deficit nation was taking appropriate measures to eliminate the deficit.

Repayments were to be made within three to five years and involved the nation's repurchase of its own currency from the Fund with other convertible currencies approved by the Fund, until the IMF once again held no more than 75 percent of the nation's quota in the nation's currency. The Fund allowed repayments to be made in currencies of which it held less than 75 percent of the issuing nation's quota. If before a nation (Nation A) completed

repayment, another nation (Nation B) borrowed Nation A's currency from the Fund, then Nation A would end repayment of its loan as soon as the Fund's holdings of Nation A's currency reached 75 percent of its quota.

If the Fund's holding of a nation's currency fell below 75 percent of its quota, the nation could borrow the difference from the Fund without having to repay its loan. This was called the super gold tranche. In the event that the Fund ran out of a currency altogether, it would declare the currency "scarce" and allow member nations to discriminate in trade against the scarce-currency nation. The reason for this was that the Fund viewed balance-of-payments adjustments as the joint responsibility of both deficit and surplus nations. However, the Fund has never been called upon to invoke this scarce-currency provision during its many years of operation.

A nation's gold tranche plus its super gold tranche (if any), or minus the amount of its borrowing (if any), is called the nation's net IMF position. Thus, the nation's net IMF position is given by the size of its quota minus the Fund's holding of its currency. The amount of gold reserves paid in by a nation upon joining the Fund was called the nation's reserve position in the Fund and was added to the nation's other international reserves of gold, Special Drawing Rights (SDRs—see the next section), and other convertible currencies to obtain the total value of the nation's international reserves (see Section 13.3).

21.4 Operation and Evolution of the Bretton Woods System

In this section, we examine the operation of the Bretton Woods system from 1947 until it collapsed in 1971. We also examine the way in which the system evolved over the years in response to changing conditions from the blueprint agreed upon in 1944.

21.4A Operation of the Bretton Woods System

While the Bretton Woods system envisaged and allowed changes in par values in cases of fundamental disequilibrium, in reality industrial nations were very reluctant to change their par values until such action was long overdue and was practically forced on them by the resulting destabilizing speculation. Deficit nations were reluctant to devalue their currencies because they regarded this as a sign of national weakness. Surplus nations resisted needed revaluations, preferring instead to continue accumulating international reserves. Thus, from 1950 until August 1971, the United Kingdom devalued only in 1967; France devalued only in 1957 and 1969; West Germany *revalued* in 1961 and 1969; and the United States, Italy, and Japan never changed their par values. Meanwhile, Canada (defying the rules of the IMF) had fluctuating exchange rates from 1950 to 1962 and then reinstituted them in 1970. Developing nations, on the other hand, devalued all too often.

The unwillingness of industrial nations to change their par values as a matter of policy when in fundamental disequilibrium had two important effects. First, it robbed the Bretton Woods system of most of its flexibility and the mechanism for adjusting balance-of-payments disequilibria. We will see in Section 21.5 that this played a crucial role in the collapse of the system in August 1971. Second, and related to the first point, the reluctance of industrial nations to change their par value when in fundamental disequilibrium gave rise

to huge destabilizing international capital flows by providing an excellent one-way gamble for speculators.

Specifically, a nation such as the United Kingdom, with chronic balance-of-payments deficits over most of the postwar period, was plagued by huge liquid capital outflows in the expectation that the pound would be devalued. Indeed, these expectations became self-fulfilling, and the United Kingdom was forced to devalue the pound in 1967 (after a serious deflationary effort to avoid the devaluation). On the other hand, a nation such as West Germany, with chronic balance-of-payments surpluses, received huge capital inflows in the expectation that it would revalue the mark. This made revaluation of the mark inevitable in 1961 and again in 1969.

The convertibility of the dollar into gold resumed soon after World War II. The major European currencies became convertible for current account purposes de facto in 1958 and de jure, or formally, in 1961. The Japanese yen became formally convertible into U.S. dollars and other currencies in 1964. As pointed out in Section 21.3A, capital account restrictions were permitted to allow nations some protection against destabilizing capital flows. Despite these restrictions, the postwar era experienced periods of huge destabilizing capital flows, which became more frequent and more disruptive, culminating in the collapse of the Bretton Woods system in August 1971. These large destabilizing "hot" money flows were facilitated by the establishment and rapid growth of *Eurocurrency markets* during the 1960s (see Section 14.7).

Under the *Trade Expansion Act of 1962* and *GATT* auspices (see Section 9.6C), the United States initiated and engaged in wide-ranging multilateral trade negotiations (the *Kennedy Round*), which lowered average tariffs on manufactured goods to less than 10 percent. However, many nontariff barriers to international trade remained, especially in agriculture and on simple manufactured goods, such as textiles, which are of special importance to developing nations. This was also the period when several attempts were made at economic integration, the most successful being the European Union (EU), then called the European Common Market (see Section 10.6A).

21.4B Evolution of the Bretton Woods System

Over the years, the Bretton Woods system evolved (until 1971) in several important directions in response to changing conditions. In 1962, the IMF negotiated the General Arrangements to Borrow (GAB) up to $6 billion from the so-called Group of Ten most important industrial nations (the United States, the United Kingdom, West Germany, Japan, France, Italy, Canada, the Netherlands, Belgium, and Sweden) and Switzerland to supplement its resources, if needed, to help nations with balance-of-payments difficulties. This sum of $6 billion was over and above the periodic increases in the Articles of Agreement that established the IMF. The GAB was renewed and expanded in subsequent years.

Starting in the early 1960s, member nations began to negotiate standby arrangements. These refer to advance permission for future borrowings by the nation at the IMF. Once a standby arrangement was negotiated, the nation paid a small commitment charge of one-fourth of 1 percent of the amount earmarked and was then able to borrow up to this additional amount *immediately* when the need arose at a 5.5 percent charge per year on the amount actually borrowed. Standby arrangements were usually negotiated by member nations as a first line of defense against anticipated destabilizing hot money flows. After

several increases in quotas, the total resources of the Fund reached $28.5 billion by 1971 (of which $6.7 billion, or about 23.5 percent, was the U.S. quota). By the end of 1971, the Fund had lent about $22 billion (mostly after 1956), of which about $4 billion was outstanding. The Fund also changed the rules and allowed member nations to borrow up to 50 percent of their quotas in any one year (up from 25 percent).

National central banks also began to negotiate so-called swap arrangements to exchange each other's currency to be used to intervene in foreign exchange markets to combat hot money flows. A central bank facing large liquid capital flows could then sell the foreign currency forward in order to increase the forward discount or reduce the forward premium on the foreign currency and discourage destabilizing hot money flows (see Sections 14.3 to 14.6). Swap arrangements were negotiated for specific periods of time and with an exchange rate guarantee. When due, they could either be settled by a reverse transaction or be renegotiated for another period. The United States and European nations negotiated many such swap arrangements during the 1960s.

The most significant change introduced into the Bretton Woods system during the 1947–1971 period was the creation of Special Drawing Rights (SDRs) to supplement the international reserves of gold, foreign exchange, and reserve position in the IMF. Sometimes called *paper gold*, SDRs are accounting entries in the books of the IMF. SDRs are not backed by gold or any other currency but represent genuine international reserves *created* by the IMF. Their value arises because member nations have so agreed. SDRs can only be used in dealings among central banks to settle balance-of-payments deficits and surpluses and not in private commercial dealings. A charge of 1.5 percent (subsequently increased to 5 percent and now based on market rates) was applied on the amount by which a nation's holdings of SDRs fell short of or exceeded the amount of SDRs allocated to it. The reason for this was to put pressure on both deficit and surplus nations to correct balance-of-payments disequilibria.

At the 1967 meeting of the IMF in Rio de Janeiro, it was agreed to create SDRs in the amount of $9.5 billion to be distributed to member nations according to their quotas in the IMF in three installments in January 1970, 1971, and 1972. Further allocations of SDRs were made in the 1979–1981 period (see Section 21.6A). The value of one SDR was originally set equal to one U.S. dollar but rose above $1 as a result of the devaluations to the dollar in 1971 and 1973. Starting in 1974, the value of SDRs was tied to a basket of currencies, as explained in Section 21.6A.

In 1961 the so-called *gold pool* was started by a group of industrial nations under the leadership of the United States to sell officially held gold on the London market to prevent the price of gold from rising above the official price of $35 an ounce. This was discontinued as a result of the gold crisis of 1968 when a *two-tier gold market* was established. This kept the price of gold at $35 an ounce in official transactions among central banks, while allowing the commercial price of gold to rise above the official price and be determined by the forces of demand and supply in the market. These steps were taken to prevent depletion of U.S. gold reserves.

Over the years, membership in the IMF increased to include most nations of the world. Despite the shortcomings of the Bretton Woods system, the postwar period until 1971 was characterized by world output growing quite rapidly and international trade growing even faster. Overall, it can thus be said that the Bretton Woods system served the world community well, particularly until the mid-1960s (see Case Study 21-1).

CASE STUDY 21-1 Macroeconomic Performance under Different Exchange Rate Regimes

Table 21.1 presents some indicators of the macroeconomic performance of the United Kingdom and the United States under the gold standard, in the interwar period, and during the post-World War II period, under fixed and flexible exchange rates. The table shows that the growth in per capita income in both the United Kingdom and the United States was higher during the post-World War II period than during the gold standard period, inflation was higher, and unemployment was lower, except for the United Kingdom during 1973–2011. Thus, aside from the lower inflation rate, the macroeconomic performance of both countries was not better during the gold standard period as compared with the post-World War II period. On the other hand, the interwar period, dominated as it was by the Great Depression, was characterized by a generally worse macroeconomic performance than either under the gold standard or in the post-World War II period. The only exception is that the growth in real per capita income during the interwar period (despite the Great Depression) in the United States exceeded its growth during the gold standard period. Caution should be exercised, however, in comparing pre- to post-World War II not only because data for the former period were of poorer quality but also (and more importantly) because many other factors affecting growth were different in the two periods.

TABLE 21.1. Macroeconomic Performance of the United States and the United Kingdom under Different Exchange Rate Regimes, 1870–2011

	Average Growth in Real per Capita Income per Year	Rate of Inflation	Rate of Unemployment
Gold Standard:			
United Kingdom (1870–1913)	1.0	−0.7	4.3[a]
United States (1879–1913)	1.4	0.1	6.8[b]
Interwar period:			
United Kingdom (1919–1938)	0.6	−4.6	13.3
United States (1919–1940)	1.6	−2.5	11.3
Post-World War II period— Fixed exchange rate period:			
United Kingdom (1946–1972)	1.7	3.5	1.9
United States (1946–1972)	2.2	1.4	4.6
Post-World War II period— Flexible exchange rate period:			
United Kingdom (1973–2011)	2.0	5.9	7.5
United States (1973–2011)	2.8	4.2	6.5

[a]1888–1913; [b]1890–1913.

Sources: M. D. Bordo, "The Classical Gold Standard: Some Lessons for Today," in *Readings in International Finance* (Chicago: Federal Reserve Bank of Chicago, 1987), pp. 83–97; M. Friedman and A. J. Schwartz, *A Monetary History of the United States* (Princeton, N.J.: Princeton University Press, 1963); and Organization for Economic Cooperation and Development, *Economic Outlook* (Paris: OECD, various issues).

21.5 U.S. Balance-of-Payments Deficits and Collapse of the Bretton Woods System

In this section, we briefly examine the causes of the U.S. balance-of-payments deficits over most of the postwar period and their relationship to the collapse of the Bretton Woods system in August 1971. We then consider the more fundamental causes of the collapse of the system and their implications for the present managed floating exchange rate system.

21.5A U.S. Balance-of-Payments Deficits

From 1945 to 1949, the United States ran huge balance-of-payments surpluses with Europe and extended Marshall Plan aid to European reconstruction. With European recovery more or less complete by 1950, the U.S. balance of payments turned into deficit. Up to 1957, U.S. deficits were rather small, averaging about $1 billion each year. These U.S. deficits allowed European nations and Japan to build up their international reserves. This was the period of the dollar shortage. The United States settled its deficits mostly in dollars. Surplus nations were willing to accept dollars because (1) the United States stood ready to exchange dollars for gold at the fixed price of $35 an ounce, making the dollar "as good as gold"; (2) dollars could be used to settle international transactions with any other nation (i.e., the dollar was truly an international currency); and (3) dollar deposits earned interest while gold did not.

Starting in 1958, U.S. balance-of-payments deficits increased sharply and averaged over $3 billion per year. Contributing to the much larger U.S. deficits since 1958 was first the huge increase in capital outflows (mostly direct investments in Europe) and then the high U.S. inflation rate (connected with the excessive money creation during the Vietnam War period), which led, starting in 1968, to the virtual disappearance of the traditional U.S. trade balance surplus. The United States financed its balance-of-payments deficits mostly with dollars so that by 1970, foreign official dollar holdings were more than $40 billion, up from $13 billion in 1949. (Foreign private dollar holdings were even larger, and these could also be potential claims on U.S. gold reserves.) At the same time, U.S. gold reserves declined from $25 billion in 1949 to $11 billion in 1970.

Because the dollar was an international currency, the United States felt that it could not devalue to correct its balance-of-payments deficits. Instead, it adopted a number of other policies which, however, had only very limited success. One of these was the attempt in the early 1960s to keep short-term interest rates high to discourage short-term capital outflows, while at the same time trying to keep long-term interest rates relatively low to stimulate domestic growth (operation twist). The United States also intervened in foreign exchange markets and sold forward strong currencies, such as the German mark, to increase the forward discount and discourage liquid capital outflows under covered interest arbitrage (see Section 14.6). It also intervened in the spot market in support of the dollar.

The resources for these interventions in the spot and forward markets were usually obtained from swap arrangements with other central banks and from standby arrangements with the IMF. The United States took additional steps to encourage its exports, reduced military and other government expenditures abroad, and tied most of its foreign aid to be spent in the United States. Furthermore, during the 1963–1968 period, the United States introduced

a number of direct controls over capital outflows. These were the Interest Equalization Tax, the Foreign Direct Investment Program, and restrictions on bank loans to foreigners.

As the U.S. deficits persisted and rose over time, U.S. gold reserves declined while foreign-held dollar reserves grew to the point where in the early 1960s they began to exceed the U.S. gold reserves. To discourage foreign official holders of dollars from converting their excess dollars into gold at the Federal Reserve and further reducing U.S. gold reserves, the United States created the so-called Roosa bonds. These were medium-term treasury bonds denominated in dollars but with an exchange rate guarantee. Nevertheless, U.S. gold reserves continued to decline, while foreign-held dollar reserves continued to rise. By 1970, they exceeded total U.S. gold reserves by a multiple of about 4.

In the face of large and persistent U.S. balance-of-payments deficits and sharply reduced U.S. gold reserves, it became evident that a realignment of parities was necessary. The United States sought unsuccessfully in 1970 and early 1971 to persuade surplus nations, particularly West Germany and Japan, to revalue their currencies. The expectation then became prevalent that the United States would sooner or later have to devalue the dollar. By now international capital markets had become highly integrated through Eurocurrency markets. This led to huge destabilizing capital movements out of dollars and into stronger currencies, particularly the German mark, the Japanese yen, and the Swiss franc. On August 15, 1971, President Nixon was forced to suspend the convertibility of dollars into gold. The "gold window" had been shut. The Bretton Woods system was dead. At the same time, the United States imposed wage and price controls as well as a temporary 10 percent import surcharge, to be lifted after the required currency realignment took place.

The ability of the United States to settle its balance-of-payments deficits with dollars had conferred an important privilege on the United States that was not available to other nations (which faced the strict limitation imposed by their limited supplies of gold and foreign exchange on the balance-of-payments deficits that they could incur). The benefit accruing to a nation from issuing the currency or when its currency is used as an international currency is referred to as seigniorage. However, the United States paid a heavy price for its seigniorage privilege. It was unable to devalue the dollar (as other nations, such as the United Kingdom and France, occasionally did) without bringing down the Bretton Woods system. The use of monetary policy was more constrained in the United States than in other nations. Consequently, the United States had to rely more heavily on fiscal policy to achieve domestic objectives and on ad hoc measures (such as controls over capital flows) to correct balance-of-payments deficits.

It is difficult to determine whether on balance the United States benefited or was harmed as a result of the dollar becoming an international currency. In any event, France, Germany, Japan, and other surplus nations began to view the United States as abusing its position as the world's banker by supplying excessive liquidity with its large and persistent balance-of-payments deficits. The unwillingness of Germany and Japan to revalue forced the United States to devalue the dollar, thus bringing the Bretton Woods system down. To a large extent, this was a political decision to remove the United States from its unique position as the "world's banker" or to take away from the United States this "exorbitant" privilege (to use Charles de Gaulle's words). The irony of it all is that the dollar remained an international currency without any backing of gold after the Bretton Woods system collapsed in August 1971 and even after the dollar was allowed to fluctuate in value in March 1973. Indeed, the amount of foreign-held dollars has risen dramatically in the years since 1971 (see Section 21.6).

21.5B Collapse of the Bretton Woods System

As explained earlier, the *immediate cause* of the collapse of the Bretton Woods system was the expectation in late 1970 and early 1971, in the face of huge balance-of-payments deficits, that the United States would soon be forced to devalue the dollar. This led to a massive flight of liquid capital from the United States, which prompted President Nixon to suspend the convertibility of the dollar into gold on August 15, 1971, and to impose a temporary 10 percent import surcharge.

In December 1971, representatives of the Group of Ten nations met at the Smithsonian Institution in Washington, D.C., and agreed to increase the dollar price of gold from $35 to $38 an ounce. This implied a devaluation of the dollar of about 9 percent. At the same time, the German mark was revalued by about 17 percent, the Japanese yen by about 14 percent, and other currencies by smaller amounts with respect to the dollar. In addition, the band of fluctuation was increased from 1 percent to 2.25 percent on either side of the new central rates, and the United States removed its 10 percent import surcharge. Since the dollar remained inconvertible into gold, the world was now essentially on a dollar standard. President Nixon hailed this Smithsonian Agreement as the "most significant monetary agreement in the history of the world" and promised that the dollar "would never again be devalued."

However, with another huge U.S. balance-of-payments deficit in 1972 ($9 billion—see Table 13.3), it was felt that the Smithsonian Agreement was not working and that another devaluation of the dollar was required. This expectation led to renewed speculation against the dollar and became self-fulfilling in February 1973, when the United States was once again forced to devalue the dollar, this time by about 10 percent (achieved by increasing the official price of gold to $42.22 an ounce). At the same time, the dollar remained inconvertible into gold. In March 1972, the original six member nations of the European Common Market decided to let their currencies float jointly against the dollar with a *total* band of fluctuation of only 2.25 percent, instead of the 4.5 percent agreed on in December 1971. This was named the *European snake* or the "snake in the tunnel" and lasted until March 1973.

When speculation against the dollar flared up again in March 1973, monetary authorities in the major industrial nations decided to let their currencies float either independently (the U.S. dollar, the British pound, the Japanese yen, the Italian lira, the Canadian dollar, and the Swiss franc) or jointly (the German mark, the French franc, and the currencies of six other central and northern European nations—the snake with the maximum total spread of 2.25 percent between the strongest and the weakest currency with respect to the dollar). The present managed floating exchange rate system was born. France abandoned the snake in 1974, Norway in 1977, and Sweden in 1978. (The United Kingdom, Italy, and Ireland had not joined in 1973.)

While the immediate cause of the collapse of the Bretton Woods system was the huge balance-of-payments deficits of the United States in 1970 and 1971, the *fundamental* cause is to be found in the interrelated problems of liquidity, adjustment, and confidence. Liquidity refers to the amount of international reserves available in relation to the need for them. International reserves comprise official holdings of gold, foreign exchange (mostly U.S. dollars), the reserve position of member nations in the IMF, and SDRs. Table 21.2 shows that most of the increase in liquidity under the Bretton Woods system resulted from the increase in official holdings of foreign exchange, mostly dollars, to finance U.S. balance-of-payments deficits.

■ TABLE 21.2. International Reserves, 1950–1973, Selected Years
(billions of U.S. dollars, at year end)

	1950	1960	1969	1970	1971	1972	1973
Gold (at official price)	33	38	39	37	36	36	36
Foreign exchange	13	19	33	45	75	96	102
SDRs	—	—	—	3	6	9	9
Reserve position in the IMF	2	4	7	8	6	6	6
Total	48	61	79	93	123	147	153

Source: International Monetary Fund, *International Financial Statistics Yearbook*, 1989.

In Table 21.2, all international reserves are expressed in terms of U.S. dollars, even though the IMF now expresses all international reserves in terms of SDRs. One SDR was equal to $1 up to 1970, about $1.09 in 1971 and 1972, and about $1.21 in 1973 (see Section 21.6A). Gold reserves were valued at the official price of gold of $35 an ounce up to 1970, at $38 an ounce in 1971 and 1972, and at $42.22 an ounce in 1973. Valued at the London free market price of gold of $112.25 an ounce prevailing at the end of 1973, total world gold reserves were $115 billion. For simplicity, all reserves were valued in U.S. dollars instead of SDRs and gold reserves were valued at official prices.

International liquidity is needed so that nations can finance temporary balance-of-payments deficits without trade restrictions while the adjustment mechanisms supposedly operate to eventually correct the deficit. Inadequate liquidity hampers the expansion of world trade. On the other hand, excessive liquidity leads to worldwide inflationary pressures. But this raised a serious dilemma, according to *Robert Triffin* (1961). Under the Bretton Woods system, most liquidity was provided by an increase in foreign exchange arising from U.S. balance-of-payments deficits. However, the longer these balance-of-payments deficits persisted and the more unwanted dollars accumulated in foreign hands, the smaller was the confidence in the dollar. The dollar shortage of the 1950s had given way to the dollar glut of the 1960s.

It was in response to this problem and in the hope that the United States would soon be able to correct its deficits that the IMF decided to create $9.5 billion of SDRs in 1967. These SDRs were distributed in three installments in January 1970, 1971, and 1972, at the very time when the world was suffering from excessive increases in liquidity resulting from huge U.S. balance-of-payments deficits. Note that the increase in SDRs from 1970 to 1971 and 1972 shown in Table 21.2 reflects not only the new installments of SDRs distributed to member nations in January of 1971 and 1972 but also the increase in the dollar value of SDRs as a result of the dollar devaluation in December 1971. Similarly, there was no new distribution of SDRs between 1972 and 1973, but the value of one SDR rose from about $1.09 in 1972 to $1.21 in 1973.

As we have seen, the United States was unable to correct its large and persistent balance-of-payments deficits primarily because of its inability to devalue the dollar. Thus, the Bretton Woods system lacked an adequate adjustment mechanism that nations would be willing and able to utilize as a matter of policy. U.S. balance-of-payments deficits persisted, and this undermined confidence in the dollar. Thus, the fundamental cause of the collapse of the Bretton Woods system is to be found in the interrelated problems of adjustment, liquidity, and confidence.

21.6 The International Monetary System: Present and Future

In this section, we examine the operation of the present managed floating exchange rate system, discuss present IMF operation, identify the most important monetary and trade problems, and evaluate proposals for reforms.

21.6A Operation of the Present System

Since March 1973, the world has had a managed floating exchange rate system. Under such a system, nations' monetary authorities are entrusted with the responsibility to intervene in foreign exchange markets to smooth out short-run fluctuations in exchange rates without attempting to affect long-run trends. This could be achieved by a policy of leaning against the wind (see Section 20.6D). To be sure, this system was not deliberately chosen but was imposed on the world by the collapse of the Bretton Woods system in the face of chaotic conditions in foreign exchange markets and huge 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 competitive exchange rate depreciations (which nations might use to stimulate their exports), thus possibly returning to the chaotic conditions of the 1930s. However, as the worst fears of abuse did not materialize, all of these attempts failed. Indeed, the 1976 Jamaica Accords formally recognized the managed floating system and allowed nations the choice of foreign exchange regime as long as their actions did not prove disruptive to trade partners and the world economy. These Jamaica Accords were ratified and took effect in April 1978.

At the beginning of 2012, half of the 187 nations that were members of the IMF had opted for some form of exchange rate flexibility. These included practically all the industrial nations and many large developing nations, so that more than four-fifths of total world trade moved between nations with managed exchange rates, either independently or jointly (as in the European Union). Most of the remaining nations adopted the currency of another nation (i.e., dollarized), operated under a currency board arrangment (CBA), or pegged their currencies to the U.S. dollar, the euro, or a basket of currencies (see Section 20.6 and Table 20.4). During the period from 1974 to 1977, again from 1981 to 1985, and since the early 1990s, the United States generally followed a policy of benign neglect by not intervening in foreign exchange markets to stabilize the value of the dollar.

In March 1979, the European Monetary System (EMS) was formed and in January 1999, the European Monetary Union (EMU) came into existence with the creation of the euro (which began actual circulation at the beginning of 2002) and the European Central Bank (ECB) beginning operation (see Section 20.4).

Under the present managed float, nations still need international reserves in order to intervene in foreign exchange markets to smooth out short-run fluctuations in exchange rates. At present, such interventions are still made mostly in dollars. In January 1975, U.S. citizens were allowed for the first time since 1933 to own gold (other than in jewelry), and the United States sold a small portion of its gold holdings on the free market. The price of gold on the London market temporarily rose above $800 an ounce in January 1980, but it soon fell and stabilized at about half of its peak price; it then rose to the all-time price high

■ TABLE 21.3. International Reserves in 2011 (billions of U.S. dollars and SDRs, at year end)

	U.S. Dollars	SDRs
Foreign exchange	10,196.4	6,641.3
SDRs	313.4	204.1
Reserve position in the IMF	150.9	98.3
Total minus gold	10,660.7	6,943.7
Gold at official price	34.8	22.7
Total with gold at official price	10,695.5	6,966.4

Source: International Monetary Fund, *International Financial Statistics* (Washington, D.C.: IMF, March 2012).

of $1,896.50 an ounce on September 5, 2001. As part of the Jamaica Accords, the IMF sold one-sixth of its gold holdings on the free market between 1976 and 1980 (and used the proceeds to aid the poorest developing nations) to demonstrate its commitment to eliminate gold (the "barbarous relic"—to use Keynes's words) as an international reserve asset. The official price of gold was abolished, and it was agreed that there would be no future gold transactions between the IMF and member nations. The IMF also continued to value its gold holdings at the pre-1971 official price of $35 or 35 SDRs an ounce. However, it may be some time before gold completely "seeps out" of international reserves—if it ever will. In the fall of 1996, the IMF agreed to sell about $2 billion of its gold holdings and use the proceeds to reduce the foreign debt of the poorest developing countries.

One SDR was valued at $1.00 up to 1971, $1.0857 after the dollar devaluation of December 1971, and $1.2064 after the subsequent dollar devaluation of February 1973. In 1974, the value of one SDR was made equal to the weighted average of a basket of 16 leading currencies in order to stabilize its value. In 1981, the number of currencies included in the basket was reduced to five and, with the advent of the euro, to the following four (with their respective relative weights in 2001 given in parentheses): U.S. dollar (45 percent); euro (29 percent); Japanese yen (15 percent); and British pound (11 percent). At the end of 2011, one SDR was valued at $1.5353.

Since 1974, the IMF has measured all reserves and other official transactions in terms of SDRs instead of U.S. dollars. Table 21.3 shows the composition of international reserves both in U.S. dollars and in SDRs (valued at $1.5353 at the end of 2011). For the composition of international reserves from 1950 to 2011 in terms of SDRs, as presented by the IMF, see Table 21.7 in the appendix.

21.6B Current IMF Operation

Several recent changes have occurred in the operation of the IMF. The quotas of IMF member nations have been increased across the board several times, so that at the end of 2011, resources totaled $369.2 billion (up from $8.8 billion in 1947). Members are generally required to pay 25 percent of any increase in their quota in SDRs or in currencies of other members selected by the Fund, with their approval, and the rest in their own currency. New members pay in their quota in the same way. The old gold tranche is now called the first-credit tranche.

The IMF has also renewed and expanded the General Arrangements to Borrow (GAB) ten times since setting them up in 1962; and in 1997, it extended it with the New Arrangement to Borrow (NAB), so that at the end of 2011, the IMF could lend up to SDR $564.2 billion to supplement its regular resources. Central bankers also expanded their swap arrangements to over $54 billion and their standby arrangements to $92 billion. Borrowing rules at the Fund were also relaxed, and new credit facilities were added that greatly expanded the overall maximum amount of credit available to a member nation. However, this total amount of credit consists of several different credit lines subject to various conditions. The IMF loans are now specified in terms of SDRs. There is an initial fee, and the interest charged is based on the length of the loan, the facility used, and prevailing interest rates. Besides the usual surveillance responsibilities over the exchange rate policies of its members, the Fund has recently broadened its responsibilities to include help for members to overcome their structural problems.

The new credit facilities set up by the IMF include (1) the Extended Fund Facility (EFF), established in 1974 for long-term assistance to support members' structural reforms to address balance of payments difficulties of a long-term character; (2) the Supplemental Reserve Facility (SRF), established in December 1997 during the Asian Crisis, to provide short-term assistance for balance-of-payments difficulties related to crises of market confidence; (3) the Compensatory and Contingency Financing Facility (CCFF), set up in 1963 to provide medium-term assistance for temporary export shortfalls or cereal import excesses; (4) the flexible credit line (FCL), created in March 2009, to provide assistance in crisis prevention; (5) the Precautionary Credit Line (PCL), available to a wider group of countries than the FCL; (6) the Post-Catastrophe Debt Relief (PCDR) Trust, established to allow the Fund to join international debt relief efforts when poor countries are hit by the most catastrophic of natural disasters; and the Systematic Transformation Facility (STF) to provide longer-term assistance for deep-seated balance of payments difficulties of a structural nature to encourage poverty-reducing growth.

A member country's overall access to Fund resources is now up to 200 percent of its quota in any single year, or twice the old cumulative limit of 100 percent, with a cumulative limit of 600 percent of a member's quota. The recipients of the loans as well as the type of loans made by the Fund also changed significantly over time. During the first 20 years of its existence, industrial countries accounted for over half of the use of Fund resources, and loans were made primarily to overcome short-term balance-of-payments problems. Since the early 1980s, most loans have been made to developing countries, and an increasing share of these loans has been made for the medium term in order to overcome structural problems. Total Fund credit and loans outstanding were $14.0 billion in 1980, $41.0 billion in 1986, and $100 billion at the end of 2011.

In the face of the huge international debt problems of many developing countries since 1982, particularly the large countries of Latin America, the IMF engaged in a number of debt rescheduling and rescue operations. As a condition for the additional loans and special help, the IMF usually required reductions in government spending, in growth of the money supply, and in wage increases in order to reduce imports, stimulate exports, and make the country more nearly self-sustaining. Such IMF conditionality, however, proved to be very painful and led to riots and even the toppling of governments during the late 1980s and 1990s. It also led to accusations that the IMF did not take into account the social needs of debtor nations and the political consequences of its demands, and that its policies were "all head and no heart." Partly in response to these accusations, the IMF has become more

flexible in its lending activities in recent years and has begun to grant even medium term loans to overcome structural problems (something that was traditionally done only by the World Bank).

In 2006, the Fund proposed some fundamental reforms of its mission toward more multilateral surveillance, such as addressing the issue of global imbalances of big member countries like the United States and China, as well as providing greater representation to Asian emerging markets, especially China, to reflect their growing economic importance, rather than focusing (as in past decades) primarily on the challenges of global poverty of its low-income members and on international financial crises that affected only a small group of vulnerable emerging-market economies.

By way of summary, Table 21.4 presents the most important dates in modern monetary history.

TABLE 21.4. Important Dates in Modern Monetary History

1880–1914	Classical gold standard period
April 1925	United Kingdom returns to the gold standard
October 1929	United States stock market crashes
September 1931	United Kingdom abandons the gold standard
February 1934	United States raises official price of gold from $20.67 to $35 an ounce
July 1944	Bretton Woods Conference
March 1947	IMF begins operation
September 1967	Decision to create SDRs
March 1968	Two-tier gold market established
August 1971	United States suspends convertibility of the dollar into gold—end of Bretton Woods system
December 1971	Smithsonian Agreement (official price of gold increased to $38 an ounce; band of allowed fluctuation increased to 4.5%)
February 1973	United States raises official price of gold to $42.22 an ounce
March 1973	Managed floating exchange rate system comes into existence
October 1973	OPEC selective embargo on petroleum exports and start of sharp increase in petroleum prices
January 1976	Jamaica Accords (agreement to recognize the managed float and abolish the official price of gold)
April 1978	Jamaica Accords take effect
Spring 1979	Second oil shock
March 1979	Establishment of the European Monetary System (EMS)
January 1980	Gold price rises temporarily above $800 per ounce
September 1985	Plaza agreement to intervene to lower value of dollar
Fall 1986	New round of GATT multilateral trade negotiations begins
February 1987	Louvre agreement to stabilize exchange rates
October 1987	New York Stock Exchange collapses and spreads to other stock markets around the world
1989–1990	Democratic and market reforms begin in Eastern Europe and German reunification occurs
December 1991	Maastricht Treaty approved calling for European Union to move toward monetary union by 1997 or 1999
December 1991	Soviet Union dissolved and Commonwealth of Independent States (CIS) formed
September 1992	United Kingdom and Italy abandon Exchange Rate Mechanism (ERM)
January 1, 1993	European Union (EU) becomes a single unified market

(continued)

■ TABLE 21.4. *(continued)*

August 1, 1993	European Monetary System allows ±15% fluctuation in exchange rates
December 1993	Uruguay Round completed and World Trade Organization (WTO) replaces GATT
January 1, 1994	North American Free Trade Agreement (NAFTA) comes into existence
January 1, 1994	Creation of the European Monetary Institute (EMI) as the forerunner of the European Central Bank by the European Union
January 1, 1999	Introduction of the single currency (the euro) and European Union-wide monetary policy by the European Central Bank (ECB)
October 2000	Euro falls to lowest level with respect to the dollar
January 1, 2002	Euro begins circulation as the currency of the 12-member European Monetary Union (EMU)
December 2006	U.S. current account deficit reaches all-time high of 6 percent of GDP
July 15, 2008	Euro reaches the all-time high of $1.60
September 15, 2008	Lehman Brothers files for bankruptcy, leading to full global financial crisis
September 5, 2011	Gold price reaches the all-time high of $1,896.50 an ounce
February 2012	Greece restructures its debt, thus avoiding default and possibly abandoning the euro

21.6c Problems with Present Exchange Rate Arrangements

The present international monetary system faces a number of serious and closely interrelated international monetary problems today. These are (1) the large volatility and the wide and persistent misalignments of exchange rates; (2) the failure to promote greater coordination of economic policies among the leading industrial nations; and (3) the inability to prevent international financial crises or to deal with them adequately when they do arise.

We have seen in Sections 14.5A and 15.5A that since 1973 exchange rates have been characterized by very large volatility and overshooting. This state of affairs can discourage the flow of international trade and investments. Much more serious is the fact that under the present managed floating exchange rate system large exchange rate disequilibria can arise and persist for several years (see Figure 14.3 and Section 14.5A). This is clearly evident from the large appreciation of the dollar from 1980 to 1985 and its even larger depreciation from February 1985 until the end of 1987. More recently, the yen–dollar exchange rate swung from 85 yen to the dollar in April 1995, to 132 yen to the dollar in February 2002, and 78 at the end of 2011. From January 1, 1999, to October 2000, the euro depreciated from $1.17 to $0.82, before rising to $1.36 in December 2004, falling to $1.18 in November 2005, and then rising to the all-time high of $1.60 on July 15, 2008. The excessive appreciation of the dollar during the first half of the 1980s and the overvaluation of the late 1990s and early 2000s has been associated with large and unsustainable trade deficits and calls for protectionism in the United States. It has also led to renewed calls for reform of the present international monetary system, along the lines of establishing target zones of allowed fluctuations for the major currencies and more international policy coordination among the leading nations. The earlier debate on the relative merits of fixed versus flexible rates has now been superseded by discussions of the optimal degree of exchange rate flexibility and policy cooperation.

Some increased cooperation has already occurred. For example, in September 1985, the United States negotiated with Germany, Japan, France, and the United Kingdom (in the

so-called Plaza Agreement in New York City), a coordinated effort to intervene in foreign exchange markets to lower the value of the dollar. In 1986, the United States negotiated with Japan and Germany a simultaneous coordinated reduction in interest rates to stimulate growth and reduce unemployment (which exceeded 10 percent of the labor force in most nations of Europe during most of the 1980s) without directly affecting trade and capital flows (see Section 18.6C). The leading industrial nations are now paying much more attention to the international repercussions of their monetary and other policy changes. In February 1987, the G-7 nations agreed at the Louvre to establish soft reference ranges or target zones for the dollar–yen and the dollar–mark exchange rates (without, however, much success). Other examples of international monetary cooperation were the quick, coordinated response to the October 1987 worldwide stock market crash; to the September 11, 2001, terrorist attacks on the United States; and to some extent to the deep recession in advanced economies and sharply reduced growth in emerging markets in 2008–2009.

A closely related problem to exchange rate misalignments is the huge dollar overhang, or large quantity of dollars held by foreigners and ready to move from monetary center to monetary center in response to variations in international interest differentials and expectations of exchange rate changes. These "hot money" flows have been greatly facilitated by the extremely rapid growth of Eurocurrency markets (see Section 14.7). One proposal of long standing aimed at eliminating this problem involves converting all foreign-held dollars into SDRs by the introduction of a substitution account by the IMF. No action, however, has been taken on this proposal, and there are several unresolved problems, such as what interest rate to pay on these SDRs and the procedure whereby the United States can buy these dollars back from the IMF. At least for the foreseeable future, the dollar will likely remain the leading international and intervention currency (see Case Studies 14-1 and 14-2).

21.6D Proposals for Reforming Present Exchange Rate Arrangements

Several proposals have been advanced to reduce exchange rate volatility and avoid large exchange rate misalignments. One proposal, first advanced by *Williamson* (1986), is based on the establishment of *target zones*. Under such a system, the leading industrial nations estimate the equilibrium exchange rate and agree on the range of allowed fluctuation. Williamson suggested a band of allowed fluctuation of 10 percent above and below the equilibrium exchange rate. The exchange rate is determined by the forces of demand and supply within the allowed band of fluctuation and is prevented from moving outside the target zones by official intervention in foreign exchange markets. The target zones would be soft, however, and would be changed when the underlying equilibrium exchange rate moves outside of or near the boundaries of the target zone. Though not made explicit, the leading industrial nations seemed to have agreed upon some such "soft" target or "reference zones" for the exchange rate between the dollar and the yen and between the dollar and the German mark at the Louvre agreement in February 1987 (but with the allowed band of fluctuation much smaller than the ± 10 percent advocated by Williamson). During the early 1990s, however, this tacit agreement was abandoned in the face of strong market pressure which saw the dollar depreciate very heavily with respect to the yen.

Critics of target zones believe that target zones embody the worst characteristics of fixed and flexible exchange rate systems. As in the case of flexible rates, target zones allow

substantial fluctuation and volatility in exchange rates and can be inflationary. As in the case of fixed exchange rates, target zones can only be defended by official interventions in foreign exchange markets and thus reduce the monetary autonomy of the nation. In response to this criticism, *Miller and Williamson* (1988) extended their blueprint to require substantial policy coordination on the part of the leading industrial nations so as to reduce the need for intervention in foreign exchange markets to keep exchange rates within the target zones.

Other proposals for reforming the present international monetary system are based exclusively on extensive policy coordination among the leading countries. The best and most articulate of these proposals is the one advanced by *McKinnon* (1984, 1988). Under this system, the United States, Japan, and Germany (now the European Monetary Union) would fix the exchange rate among their currencies at their equilibrium level (determined by purchasing-power parity) and then closely coordinate their monetary policies to keep exchange rates fixed. A tendency for the dollar to depreciate vis-à-vis the yen would signal that the United States should reduce the growth rate of its money supply, while Japan should increase it. The net overall increase in the money supply of these three countries (or areas) would then be expanded at a rate consistent with the noninflationary expansion of the world economy.

Another proposal advocated by the IMF Interim Committee in 1986 was based on the development of *objective indicators* of economic performance to signal the type of coordinated macropolicies for nations to follow, under the supervision of the Fund, in order to keep the world economy growing along a sustainable noninflationary path. These objective indicators are the growth of GNP, inflation, unemployment, trade balance, growth of the money supply, fiscal balance, exchange rates, interest rates, and international reserves. A rise or fall in these objective indicators in a nation would signal the need for respectively restrictive or expansionary policies for the nation. Stability of the index for the world as a whole would be the anchor for noninflationary world expansion.

As long as nations have very different inflation–unemployment trade-offs, however, effective and substantial macroeconomic policy coordination is practically impossible. For example, during the 1980s and early 1990s, the United States seemed unable or unwilling to reduce its huge budget deficit substantially and rapidly. Germany has been unwilling to stimulate its economy even though it faced a high rate of unemployment, and Japan has been very reluctant to dismantle its protectionistic policies to allow more imports from the United States so as to help reduce the huge trade imbalance between the two nations. Empirical research has also shown 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 (see Section 20.7).

Another class of proposals for reforming the present international monetary system is based on the premise that huge international capital flows in today's highly integrated international capital markets are the primary cause of exchange rate instability and global imbalances afflicting the world economy today. These proposals are, therefore, based on restricting international speculative capital flows. *Tobin* (1978) would do this with a transaction tax that would become progressively higher the shorter the duration of the transaction in order "to put some sand in the wheels of international finance." *Dornbusch and Frankel* (1987) would instead reduce financial capital flows internationally with dual exchange rates—a less flexible one for trade transactions and a more flexible one for purely financial transactions not related to international trade and investments. By restricting international "hot money" flows through capital market segmentation or the decoupling of asset markets, *Tobin, Dornbusch, and Frankel* believed that the international financial system could be

made to operate much more smoothly and without any need for close policy coordination by the leading industrial countries, which they regard as neither feasible nor useful. Critics of these proposals, however, point out that it is next to impossible to separate "nonproductive" or speculative capital flows from "productive" ones related to international trade and investments. Finally, there is the single world currency advocated by *Mundell* because "a global economy requires a global currency."

It remains to be seen, however, if the leading nations are prepared to give up some of their autonomy in the coming years in order to have greater success in achieving their economic objectives. In the end, reform of the present international monetary system is likely to involve improving the functioning of the present system rather than replacing the present system by establishing a brand new one [see *Kenen* (1983, 2007); *Goldstein* (1995); *Eichengreen* (1999, 2008); *Salvatore* (2000, 2002, 2005, 2010, 2011, 2012); *Rajan* (2008, 2010); *Truman* (2006, 2009); *Dooley, Folkets-Landau, and Garbar* (2009); *Ghosh, Ostry, and Tsangarides* (2010); *Stigliz* (2010); *Klein and Shambaugh* (2010); *Reinhart and Rogoff* (2010); and *Razin and Rosefielde* (2011)].

21.6E Financial Crises in Emerging Market Economies

Another serious problem facing the present international monetary system is its seeming inability to prevent international financial crises in emerging and advanced market economies. There have been six crises in emerging markets since the mid-1990s: Mexico in 1994–1995, Southeast Asia in 1997–1999, Russia in summer 1998, Brazil in 1999, and Turkey and Argentina in 2001–2002 (see Case Studies 21-2 and 21-3). The IMF

CASE STUDY 21-2 The Anatomy of a Currency Crisis: The Collapse of the Mexican Peso

In December 1994, Mexico found itself in the grip of an intense financial crisis that triggered the deepest recession the country had faced in decades. The immediate cause for the crisis was the sharp increase in U.S. interest rates during 1994, which reversed the large United States to Mexico capital flow. This was aggravated by the political crisis triggered by the armed rebellion in the southern state of Chiapas in January 1994 and the murder of two high political officials later in 1994.

In order to reverse the resulting massive capital outflows, Mexico started to issue short-term, dollar-denominated securities and sharply increased domestic interest rates. Fearful that Mexico would not be able to service its loan obligations, however, foreign investors continued to pull funds out of Mexico. This forced Mexico to devalue the peso by 15 percent from 3.500 pesos to the dollar to 4.025 on December 20, 1994. But this was too little too late, and in the face of continued loss of international reserves, Mexico was forced to let the peso float. The peso then depreciated to 7 pesos to the dollar by March 1995 and reached nearly 8 pesos to the dollar in December 1995.

In order to help Mexico and to prevent the spread of the financial crisis to other emerging markets (particularly Argentina and Brazil), the United States organized an international support package of nearly $48 billion through the IMF in January 1995, which succeeded in calming financial markets and containing the crisis to Mexico. But very high interest rates and deep budget deficit cuts plunged Mexico into a deep recession in 1995. It was only in 1996 that the bottom of the recession was reached and growth resumed in Mexico.

Source: Federal Reserve Bank of Atlanta, "A Predictable and Avoidable Mexican Meltdown," *Economics Update*, December 1996, pp. 1–3.

CASE STUDY 21-3 Chronology of Economic Crises in Emerging Markets: From Asia to Argentina

Table 21.5 presents the chronology of the economic crises in emerging markets from the late 1990s to the present. The economic crises of the 1990s in emerging markets started in Thailand in July 1997. By fall 1997 the crisis had spread to the Philippines, South Korea, Indonesia, and Malaysia; by summer 1998 to Russia; and in January 1999 to Brazil. It also affected China, Taiwan, Hong Kong, and Singapore, as well as Mexico and Argentina and, to some extent, most other developing countries. By the end of 1999, the crisis was more or less over, and growth resumed in most emerging markets, except Indonesia and Russia. In 2001, however, a banking and financial crisis erupted in Turkey, and in 2002, Argentina faced a total financial, economic, and political collapse. Both of these crises, however, were more or less resolved by 2003. In 2008–2009, growth in most emerging markets slowed significantly as a result of the deep recession engulfing most advanced economies (see Case Study 21-5).

TABLE 21.5. Chronology of Economic Crises in Emerging Markets from the Late 1990s

1997	
May 15	Thailand announces capital controls in an effort to ease the pressure on the baht.
July 2	Thailand devalues the baht by 15 to 20 percent.
July 14	The Philippines and Indonesia devalue the peso and the rupiah, respectively.
August 20	Thailand and the IMF agree on a $17 billion financial stabilization package.
October 27	The Dow Jones Industrial Average falls 554 points amid Asian fears.
October 31	Indonesia and the IMF agree on a $23 billion financial support package.
November 7	Financial markets in Argentina, Brazil, Mexico, and Venezuela fall sharply.
November 17	South Korea abandons its defense of the won.
December 3	South Korea and the IMF agree on a $57 billion financial assistance package.
December	The South Korean won and the Indonesian rupiah collapse.
December 30	Foreign banks agree to roll over South Korea's $100 billion short-term debt.
1998	
Early March	The Indonesian economy verges on hyperinflation; rioting erupts. The government subsidizes food imports, violating the IMF program.
April 10	Indonesia signs a new letter of intent with the IMF for a new reform program.
Early May	The economic situation in Indonesia deteriorates; more frequent and larger riots erupt.
May 19	Political upheaval in Indonesia causes markets in Russia to fall sharply amid fears of spreading financial contagion.
May 21	Suharto resigns as president of Indonesia; B. J. Habbie takes over.
May 26	The South Korean stock market hits an 11-year low.
May 27	The Russian Central Bank triples interest rates to 150% to encourage foreign capital to stay.
July 13	Russia and the IMF agree on an emergency $22.6 billion financial stabilization package.
August 17	Russia devalues the ruble and defaults on payments on its short-term debt.
Late September	The New York Federal Reserve Bank coordinates a bailout of Long-Term Capital Management, a hedge fund with some $100 billion in liabilities.
November 13	Brazil negotiates a $41.5 billion IMF/World Bank/multicountry rescue package.

(continued)

CASE STUDY 21-3 (Continued)

TABLE 21.5. *(continued)*

1999	
January 8	Brazil devalues the real by 8 percent in the face of large capital outflows.
January 15	Brazil allows the real to float freely on world markets, and the real declines by 35 percent.
January 27	China denies rumors that it will devalue the yuan; China's growth rate declines.
Late 1999	Financial crises in emerging markets declared over; growth resumes.
2001	
February	Turkey suffers banking crisis and lets the currency (the lira) float.
December	Argentina defaults on its debt (largest in history).
2002	
January	Argentina experiences end of currency board arrangements and devaluation of peso and plunges into financial, economic, and political turmoil; IMF refuses to grant loans without credible plan for economic restructuring.
February 4	Turkey receives IMF loan of $12.8 billion.
August 7	Brazil receives $30 billion grant to help it avoid new financial crisis.
2005	
June	Argentina restructures its foreign debt with about 75 percent of its bondholders.
July	China revalues its currency by 2 percent and breaks its exchange rate peg to the dollar.
November	Brazil pays off its outstanding IMF debt early.
2006	
January	Argentina pays off its outstanding IMF debt early.

Source: Inter-American Development Bank, 1999; updated by the author.

estimated that the cumulative loss of output as a percentage of GDP over the years of the most recent crises was 30 for Mexico, 82 for Indonesia, 57 for Thailand, 39 for Malaysia, and 27 for Korea (there are no estimates for Brazil, Russia, Turkey, or Argentina).

Although the fundamental problem that led to these crises was different, the process was very similar. Each crisis started as a result of a massive withdrawal of short-term liquid funds at the first sign of financial weakness in the nation. Foreign investors poured funds into many emerging markets during the early 1990s after these nations liberalized their capital markets in order to take advantage of high returns and in order to diversify their portfolios, but immediately withdrew their funds on a massive scale at the first sign of economic trouble in the nation—thereby precipitating a crisis. The danger for the international monetary system is that such crises could spread to the rest of the world, including advanced countries.

The heavy currency devaluation that usually accompanies a financial crisis leads to a further serious economic harm to a developing country. This is due to the fact that developing countries, as opposed to advanced ones, are usually forced to borrow in terms of a major foreign currency (the dollar, euro, or yen) because lenders worry (based on past experience) about being repaid with a devalued currency of the nation. Thus, when a developing country's currency is devalued, the domestic-currency value of its debt increases by the percent of the devaluation (i.e., there is transfer of wealth to foreign lenders). The inability of a

developing country to borrow in its own currency was called the original sin by *Eichengreen and Hausmann* (1999)—and the name stuck. In recent years, some habitual past "sinners," such as Mexico and Brazil, have been able to borrow in their own currency. Still, many private borrowers in developing countries continue to borrow in dollars and thus would face a problem if the nation's currency is devalued or depreciates.

A number of measures have been proposed, and some steps have already been taken to avoid or minimize such crises in the future and thus greatly strengthen the *architecture of the present international monetary system* and improve its functioning. These include (1) increasing transparency in international monetary relations, (2) strengthening banking and financial systems, and (3) promoting greater private-sector involvement.

Increased transparency is essential because markets cannot work efficiently without adequate, reliable, and timely information. To this end, the IMF established the *Special Data Dissemination Standards (SDDS)* in 1996 and the *General Data Dissemination System (GDDS)* in 1997 (enhanced in 2001 by the *Data Quality Assessment Framework*). These *early-warning financial indicators*, such as the budget and current account deficit, long-term and short-term foreign debts, and international reserves as percentages of GDP, could signal which emerging country or countries might be heading for trouble. The hope is that foreign investors would take note of the potential problem and avoid pouring excessive funds into the nation or nations, thus possibly avoiding a crisis.

The second way of improving the architecture of the present international monetary system is by strengthening emerging markets' banking and financial systems. Weakness in the banking systems was common to all emerging markets that were involved in financial crises during the past decade. A weak banking and financial system invites a financial crisis and guarantees its severity. The banking and financial system can be strengthened by improving supervision and prudential standards, and making sure that banks meet capital requirements, make adequate provisions for bad loans, and publish relevant and timely information on their loan activity. It is also important to deal with insolvent institutions promptly and effectively. Implementing these policies is difficult, especially when a nation's banking and financial system is already in trouble, but a sound financial system is essential for the health and growth of the entire economy. The IMF has been formulating standards or codes of good practice in accounting, auditing, corporate governance, payments and settlements systems, insurance, and banking, and some of these are already being implemented as part of the IMF surveillance function.

The third way of strengthening the present international monetary system is to get much greater private-sector involvement in resolving a financial crisis in emerging markets by rolling over and renegotiating loans or providing new money rather than rushing for the exit, as a precondition for IMF official assistance. The logic is that lenders should be compelled to take some responsibility for the crisis by having lent too much short-term funds to an emerging market for nonproductive purposes. That is, lenders should be "bailed in" rather than be allowed to bail out and rush for the exit door. To this end, the IMF has proposed the creation of a *Sovereign Debt Restructuring Mechanism (SDRM)* for quickly returning an emerging market economy facing a financial problem to sustainability.

Financial crises are not confined to emerging markets, however. In 2008–2009, the United States and most other advanced nations faced a serious financial and economic crisis (see Case Study 21-4). It was at this time that the Group of Twenty (G-20) economies "seized power" and essentially replaced the G-7 (or G-8, which includes Russia) as the steering

CASE STUDY 21-4 The Financial Crisis in the United States and Other Advanced Economies

The U.S. subprime mortgage crisis started in the United States in 2007 and from there it spread to the rest of the financial sector and the real economy of the United States and the world in 2008. This was the first global financial crisis of the twenty-first century and the most serious financial crisis in a generation. The losses from the crisis have been estimated in the trillions of dollars in the United States alone.

Subprime mortgages are housing loans issued to borrowers facing a high risk of being unable to meet their mortgage payments. Many of these subprime mortgages were made at variable rates in 2003 and 2004 when the U.S. lending rate was the lowest in 50 years and led to a serious housing bubble (home prices rising very rapidly and excessively). When the Fed started to increase interest rates in June 2004 to fight inflationary pressures, many subprime borrowers defaulted on their mortgages, housing prices fell, and financial institutions faced huge losses, write-downs, and failures. Troubles in the U.S. housing market then brought to light other questionable and downright fraudulent financial activities and led to a system-wide financial crisis. The financial crisis was thus caused by deregulation or inadequate regulations of the financial activities of investment banks, by the inadequate application of regulations that were already on the books (i.e., rating agencies and the SEC not doing their job), by unfortunate economic policies (granting home mortgages to people who could not afford them), by outright fraud (such as Madoff's incredible $65 billion Ponzi scheme), and by economic greed (CEOs and financial firms caught in a gigantic profit-seeking scheme regardless of risk).

The result was that banks stopped making loans, consumers reduced spending, and what started as a purely financial crisis spilled to the real sector of the economy, plunging the United States into deep recession (which officially started in December 2007) despite trillions of dollars spent by the U.S. government to refinance and rescue banks and on the stimulus packages. More or less the same thing occurred in other advanced countries, which also fell into deep recession in 2008. In our highly globalized and interdependent world, recession in advanced countries then sharply reduced growth in emerging markets.

Some people blame the operation of the international monetary system for the present financial crisis. But the present crisis has a domestic origin and a better working international monetary system would not have led to contagion in other advanced countries if they had not faced the same financial excesses that occurred in the United States. In the medium term, the United States needs to save more and learn to live within its means. Some adjustment seems to have started with the U.S. savings rate rising since 2008. By 2010, growth had resumed in most countries, but growth remained slow.

Source: D. Salvatore, "The Global Financial Crisis: Predictions, Causes, Effects, Policies, Reforms and Prospects," *Journal of Economic Asymmetries*, December 2010, pp. 1–20.

committee of the world economy. In 2009, the G-20 included the finance ministers and central bank governors of the following 19 countries: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, and the United States. The twentieth member was the European Union, which is represented by the rotating Council presidency and the European Central Bank. In addition to these 20 members, the following forums and institutions, as represented by their respective chief executive officers, participate in meetings of the G-20: International Monetary Fund (IMF), World Bank (WB), International

Monetary and Financial Committee (MFC), and Development Committee (DC) of the IMF and World Bank. The G-20 met in London in April 2009 to propose policies to overcome the deep financial and economic crisis and push for reforms to prevent future crises based on (1) strengthening financial supervision and regulation, (2) fostering international policy coordination, (3) reforming the IMF, and (4) maintaining open markets. Other meetings followed aimed primarily at reforming the international financial system and providing a new direction for the world economy, but to date (2012), not many concrete steps have been taken to attain these goals.

21.6F Other Current International Economic Problems

The problems arising from the present exchange rate arrangements and from the global financial and economic crises that we've discussed are closely related to other serious economic problems facing the world today: (1) slow growth and high unemployment in advanced economies after the "great recession"; (2) trade protectionism in advanced countries in the context of a rapidly globalizing world; (3) large structural imbalances in the United States, slow growth in Europe and Japan, and insufficient restructuring in transition economies of Central and Eastern Europe; (4) deep poverty in many developing economies; and (5) resource scarcity, environmental degradation, and climate change that endanger growth and sustainable world development. This section suggests possible solutions to these interrelated problems at which we can arrive after the study of international economics.

1. *Slow Growth and High Unemployment in Advanced Economies after the Great Recession*
   In 2010 and 2011, advanced economies experienced slow growth and high unemployment as they came out of the most serious financial and economic crisis since the Great Depression of 1929. The United States and other advanced nations responded by rescuing banks and other financial institutions from bankruptcy, slashing interest rates, and introducing huge economic stimulus packages. These efforts, however, only succeeded in preventing the economic recession from being deeper than otherwise. Even though the recession was officially over in 2010, slow growth and high unemployment remain the most serious economic problems facing most advanced nations today. These problems are even greater for Greece, Ireland, Portugal, Spain, and Italy (all members of the 17-nation European Monetary Union), which remain in deep crisis from overborrowing, unsustainable budget deficits, and loss of international competitiveness.

   Advanced economies could try to stimulate growth and reduce unemployment with additional expansionary fiscal and monetary policies, but with already large and unsustainable budget deficits and huge amounts of excess liquidity already in the system, these policies may be ineffective and could even backfire. Larger budget deficits could discourage private consumption because consumers anticipate paying higher taxes in the future to pay for the higher budget deficits. Similarly, by adding more liquidity when so much is already in the system may not stimulate investments and growth and only pose greater inflationary pressures in the future. To increase growth it may be more promising to further restructure the economy and improve education and infrastructures. But these policies take years to bear fruit, are difficult to implement in times of slow growth, and require additional expenditures at a time when most nations face already high and unsustainable budget deficits.

2. *Trade Protectionism in Advanced Countries in the Context of a Rapidly Globalizing World*

We have seen in Section 9.3 that since the mid-1970s, there has been a rapid proliferation of nontariff trade barriers (NTBs) to the point where they now represent the most serious threat to the postwar trading system and the world's welfare. By interfering with the flow of international trade, rising protectionism leads to a misallocation of resources internationally, a slowdown in structural adjustments in mature economies and growth in developing economies, and it raises the specter of trade wars. The problem has been rendered more complex by the breakup of the world into three major trading blocs: the North American Free Trade Agreement (NAFTA, including the United States, Canada, and Mexico); the European bloc or European Union (EU); and a much less defined and looser Asian bloc (see Section 10.6).

The successful completion of the Uruguay Round in December 1993 went a long way toward reducing or at least putting an end to increased protectionism in the world today. As pointed out in Section 9.7b, however, many serious trade problems remain. Some sectors (such as insurance) were not included in the agreement, agricultural subsidies remain high, patent protection for pharmaceuticals is disappointing, and trade in computer chips is still subject to tariffs. Although tightened, antidumping action and safeguards are still possible, and so the potential for serious trade disputes remains. These problems were to be addressed in a new round of multilateral trade negotiations (the Doha Round) launched in November 2011 in Doha, Qatar (which, however, all but failed). Regional trade agreements are no substitute for true multilateralism.

Technological change, globalization, and increased competition from the manufactured exports of emerging economies, especially China, are held responsible for widespread firm downsizing, job insecurity, and stagnant wages in the United States and other advanced countries. The solution to these problems is not to restrict trade and reduce international competition but to increase job training and create a labor force more skilled and prepared for the new information-age jobs that open up in telecommunications, computers, biomedical, and other high-tech fields. But this requires that workers in the United States and other advanced economies continuously upgrade their skills to meet the needs of the new high-tech jobs that open up, that they are willing to move to where the jobs are created, and accept more skilled immigrants will the United States and other advanced economies remain internationally competitive. This is the price that workers in rich countries have to pay for the higher productivity, wages, and standards of living that the "new economy" brings.

3. *Structural Imbalances in Advanced Economies and Insufficient Restructuring in Transition Economies*

Today, many advanced economies face deep structural problems that hamper their growth. The United States faces deep structural imbalances in the form of excessive spending and inadequate national saving. This means that the United States is living beyond its means by borrowing excessively abroad. The result is huge and unsustainable trade deficits, a depreciated dollar, and unstable financial conditions (see Case Study 21-5). Being such a huge economy, U.S. economic problems quickly become global economic problems in our interdependent world. The United States needs to cut its spending deeply and sharply increase its savings rate in order to overcome its serious structural imbalance. While this cannot be easily or quickly accomplished, the United States does not seem to be trying sufficiently hard to resolve its problems.

CASE STUDY 21-5 Trade Imbalances of the Leading Industrial Nations

One of the most serious global imbalances facing the world economy today is the large and chronic trade deficits of the United States and the United Kingdom and surplus of Germany (among advanced nations). Table 21.6 shows that the U.S. trade deficit increased from $25.5 billion in 1980 to $110.3 billion in 1990, $443.9 billion in 2000, to a high of $832.9 billion in 2006 (not shown in the table), and it was $735.2 billion in 2011. Germany's trade surplus rose from $2.1 billion in 1960 to the all-time high of $273.5 billion in 2007 (not shown in the table), and it was $214.6 billion in 2011. In 2011, Japan, the United Kingdom, France, and Italy had trade deficits, respectively, of $20.6 billion, $159.8 billion, $102.3 billion, and $24.7 billion, while Canada had nearly balanced balance.

The U.S. dollar appreciated by nearly 40 percent on a trade-weighted basis from 1981 to 1985, but then depreciated even more from 1985 to 1988, but the U.S. trade deficit started to decline only in 1988. Despite record trade deficits, the U.S. dollar appreciated sharply from 1995 until 2000 because rapid growth attracted huge amounts of foreign capital to the United States. The U.S. trade deficit continued to increase until 2006 even though the dollar started to depreciate in mid-2005. The current U.S. trade deficit is unsustainable in the long run as is the large trade surplus of Germany (among advanced nations).

TABLE 21.6. Trade Imbalances of the Leading Industrial Countries, 1960–2011, Selected Years (in billions of U.S. dollars)

Country	1960	1970	1980	1990	1995	2000	2005	2008	2011
United States	4.9	2.6	−25.5	−110.3	−172.3	−443.9	−777.8	−827.1	−735.2
Japan	0.3	4.0	2.1	69.3	131.8	116.7	94.0	38.1	−20.6
Germany	2.1	5.7	7.9	68.5	65.1	56.4	194.9	267.2	214.6
United Kingdom	−1.1	0.0	3.4	−32.5	−19.0	−49.9	−124.7	−173.5	−159.8
France	0.6	0.3	−14.1	−13.3	11.0	−3.2	−27.8	−87.3	−102.3
Italy	−0.6	−0.2	−15.9	−1.5	39.7	9.5	0.6	−2.8	−24.7
Canada	−0.2	3.0	7.9	9.5	25.9	45.0	51.7	43.8	2.2

Sources: International Monetary Fund, *International Financial Statistics Yearbook*, various years; and D. Salvatore, "Global Imbalances," *Princeton Encyclopedia of the World Economy* (Princeton University Press, 2008).

Europe faces a somewhat different structural problem that dampened its growth and led to high unemployment even before the recent global financial crisis. Most European countries have overgenerous social security benefits and inflexible labor markets, which discourage work and job creation in the face of globalization and international competition. With high unemployment, Europe imports less than it would otherwise and tends to restrict trade in the vain effort to protect jobs. Again, we see how in our interdependent world, a national or regional problem quickly becomes a general global problem. The emerging consensus is that solving Europe's unemployment problem requires scaling down social security benefits and eliminating the regulations that hinder labor market flexibility (if it is very difficult to fire workers, employers will think twice before hiring them). But this is more easily said than done, especially since Europeans are justifiably proud of their high wages and comprehensive social-labor.

Japan suffered three recessions and anemic growth from the early 1990s, when the real estate bubble burst and left many banks with huge amounts of noncollectible loans. Banks then stopped making loans, even to deserving businesses, and the nation plunged into economic stagnation. Japan tried almost everything to overcome its problem. It lowered interest rates to practically zero to stimulate private investments, it undertook huge public works to build roads and other infrastructure (often not needed) in order to jump-start and stimulate the economy, and it kept the exchange rate undervalued to stimulate exports. Nevertheless, it wasn't until 2004 that Japan seemed to finally emerge from economic crisis—only to fall back into deep recession during the recent global financial crisis. Japan must cut its excessive budget deficit and national debt, and correct the serious inefficiencies in its distribution system. But, as was pointed put earlier, it is difficult to restructure the economy, eliminate inefficiencies, and cut budgets in the face of slow growth.

Although considerable progress has been made in restructuring and establishing market economies in *transition economies* (the former centrally planned economies of Central and Eastern Europe and the Soviet Unon), the process is far from complete. As pointed out in Section 10.6E, these countries need massive amounts of foreign capital and technology, as well as more liberal access to Western markets, in order to establish full-fledged market economies. Slow growth and high unemployment in Western Europe, however, retarded progress. Ten transition economies (eight in Central and Eastern Europe plus Cyprus and Malta) were admitted into the European Union in 2004, Bulgaria and Romania entered in 2008, and five have formally adopted the euro. These countries are facilitating their process of economic restructuring and integration into the world economy, and closing their large gaps in standard of living with other advanced economies.

4. *Deep Poverty in Many Developing Countries*

Even though many developing countries are now growing very rapidly, many of the poorest developing nations, particularly those in sub-Saharan Africa, face deep poverty, unmanageable international debts, economic stagnation, and widening international inequalities in living standards. These conditions pose serious problems for the world economy. An international economic system that has spread the benefits from international trade and specialization so unevenly can hardly be said to be functioning properly—not to mention equitably. And a world where millions of people starve not only is unacceptable from an ethical point of view but also can hardly be expected to be a peaceful and tranquil world. Chapters 8 and 11 estimated the reasons that international inequalities in standards of living between the rich and the poorest developing countries of the world are so large and widening and suggested what can be done to overcome them.

Over the years, the United Nations Conference on Trade and Development (UNCTAD) and other international forums have advanced many proposals to improve conditions in developing nations and stimulate their development. These proposals lost some of their immediacy during the 1980s and 1990s because developed countries (especially Western Europe, Japan, and the United States) were absorbed with their own domestic problems of monetary and exchange rate instability, slow growth, structural imbalances, and high unemployment. As part of the demands for a New

International Economic Order (NIEO—see Section 11.6C), developing countries have been demanding both greater access for their exports to developed country markets and much greater flow of aid.

The successful completion of the Uruguay Round in December 1993 only partially addressed the trade problems facing developing countries. The foreign aid granted by developed countries has stagnated despite the fact that the problems faced by the poorest developing countries remain oppressively high (see Case Study 11-5). The *Millennium Declaration* in September 2000 set precise objectives incorporating specific targets for reducing income poverty, tackling other sources of human deprivation, and promoting sustainable development by 2015 (see Case Study 11-6). Most important, the Doha Round was to address the trade problem, but, as pointed out earlier, it has all but failed. The hope now is that the Group of Twenty (G-20) will be more successful in addressing the serious trade problems of the poorest developing countries.

5. *Resource Scarcity, Environmental Degradation, Climate Change, and Sustainable Development*

Growth in rich countries and development in poor countries are today threatened by resource scarcity, environmental degradation, and climate change. In the face of rapidly growing demand, particularly by China and India, and supply rigidities in producing nations, the price of petroleum, other raw materials, and food has risen sharply during the past few years. In many emerging market economies, protection of the environment takes a back seat to the growth imperative. Environmental pollution is dramatic in some parts of China, and in South America the Amazon forest is rapidly being destroyed. We are witnessing very dangerous climate changes that may have increasingly dramatic effects on life on Earth in all countries, but especially in the poorest developing ones. These problems, however, can be only adequately analyzed and addressed by a joint effort of all the sciences together, a major worldwide cooperative effort, and a change in world governance.

It is clear from this discussion that the international economic problems facing the world today are closely interrelated. For example, excessive U.S. trade and budget deficits lead to protectionism and dollar depreciation, which affect all countries, developed and developing. They also show the strong links between international trade discussed in the first half of the text (Chapters 2–12) and international finance discussed in the second half (Chapters 13–21).

Despite their seriousness, the world has faced similar, and sometimes even worse, problems in the past. The hope is that the world can tackle the current economic, financial, social, political, and environmental challenges in the spirit of cooperation and mutual understanding.

SUMMARY

1. In this chapter, we examined the operation of the international monetary system from the gold standard period to the present. An international monetary system refers to the rules, customs, instruments, facilities, and organizations for effecting international payments. International monetary systems can be classified according to the way in which exchange rates are determined or according to the form that international reserve assets take. A good international monetary system is one that maximizes the flow of

international trade and investments and leads to an equitable distribution of the gains from trade among nations. An international monetary system can be evaluated in terms of adjustment, liquidity, and confidence.

2. The gold standard operated from about 1880 to the outbreak of World War I in 1914. Most of the actual adjustment under the gold standard seems to have taken place through stabilizing short-term capital flows and induced income changes, rather than through induced changes in internal prices, as postulated by the price-specie-flow mechanism. Adjustment was also greatly facilitated by buoyant and stable economic conditions. The period from 1919 to 1924 was characterized by wildly fluctuating exchange rates. Starting in 1925, Britain and other nations attempted to reestablish the gold standard. This attempt failed with the deepening of the Great Depression in 1931. There followed a period of competitive devaluations as each nation tried to "export" its unemployment. This, together with the serious trade restrictions imposed by most nations, cut international trade almost in half.

3. The Bretton Woods system agreed upon in 1944 called for the establishment of the International Monetary Fund (IMF) for the purposes of (1) overseeing that nations followed a set of agreed rules of conduct in international trade and finance and (2) providing borrowing facilities for nations in temporary balance-of-payments difficulties. This was a gold-exchange standard with gold and convertible currencies (only U.S. dollars at the beginning) as international reserves. Exchange rates were allowed to fluctuate by only 1 percent above and below established par values. Par values were to be changed only in cases of fundamental disequilibrium and after approval by the Fund. Each nation was assigned a quota in the Fund, depending on its importance in international trade. A nation had to pay 25 percent of its quota in gold and the remaining 75 percent in its own currency. A nation in balance-of-payments difficulties could borrow 25 percent of its quota from the Fund each year by depositing more of its currency in exchange for convertible currencies, until the Fund held no more than 200 percent of the nation's quota in the nation's currency.

4. Under the Bretton Woods system, industrial nations in fundamental disequilibrium were very reluctant to change par values. The convertibility of the dollar into gold resumed soon after the war, and that of other industrial nations' currencies resumed by the early 1960s. Tariffs on manufactured goods were lowered to an average of less than 10 percent by 1971. Through increased membership and quota increases, the resources of the Fund rose to $28.5 billion by 1971. The Fund also negotiated the General Arrangements to Borrow to further augment its resources. Nations negotiated standby arrangements with the Fund and swap arrangements with other central banks. The IMF also began to allow member nations to borrow up to 50 percent of their quota in any one year. In 1967 the IMF decided to create $9.5 billion of Special Drawing Rights (distributed in 1970–1972) to supplement international reserves. In 1961 the gold pool was set up, but it collapsed in 1968 and the two-tier system was established. During the Bretton Woods period, the European Union and the Eurocurrency markets came into existence, world output grew rapidly, and international trade grew even faster.

5. Use of the dollar as the principal international currency conferred the benefit of seigniorage on the United States, but the United States could not devalue to correct balance-of-payments deficits and its monetary policy was seriously constrained. The immediate cause of the collapse of the Bretton Woods system was the huge balance-of-payments deficit of the United States in 1970 and the expectation of an even larger deficit in 1971. This led to massive destabilizing speculation against the dollar, suspension of the convertibility of the dollar into gold on August 15, 1971, and a realignment of currencies in December 1971. The fundamental cause of the collapse of the Bretton Woods system is to be found in the lack of an adequate adjustment mechanism. The persistence of U.S. balance-of-payments deficits provided for the system's liquidity but also led to loss of confidence in the dollar. The dollar was devalued again in February 1973. In March 1973, in the face of continued speculation against the dollar, the major currencies were allowed to fluctuate either independently or jointly.

6. Since March 1973, the world has operated under a managed float (formally recognized in the Jamaica Accords, which took effect in April 1978). In March 1979, the European Monetary System was formed, in October 1988, the European Central Bank was created, the euro was introduced on January 1, 1999, and

began circulating on January 1, 2002, as the single currency of the European Monetary Union. Borrowing at the IMF has been relaxed, and significant new credit facilities have been created. The most significant monetary problems facing the world today are the excessive fluctuations and large misalignments in exchange rates. Target zones and greater international macroeconomic policy coordination have been advocated to overcome them. During the past decade, there were a series of financial and economic crises in Mexico, Southeast Asia, Russia, Brazil, Turkey, and Argentina, and in 2008–2009 in the United States and most other advanced economies. Proposed solutions by the G-20 include strengthening financial supervision and regulation, fostering international policy coordination, reforming the IMF, and maintaining open markets. Other serious international economic problems are (1) slow growth and high unemployment in advanced economies after the "great recession," (2) trade protectionism in advanced countries in the context of a rapidly globalizing world, (3) large structural imbalances in the United States, slow growth in Europe and Japan, and insufficient restructuring in transition economies of Central and Eastern Europe, (4) deep poverty in many developing economies, and (5) resource scarcity, environmental degradation, and climate change that endanger growth and sustainable world development.

KEY TERMS

Adjustment, p. 688
Benign neglect, p. 702
Bretton Woods system, p. 692
Confidence, p. 688
Credit tranches, p. 693
Currency convertibility, p. 692
Dollar glut, p. 701
Dollar overhang, p. 707
Dollar shortage, p. 698
Dollar standard, p. 700
First-credit tranche, p. 703
Fundamental disequilibrium, p. 692
General Arrangements to Borrow (GAB), p. 695
Gold tranche, p. 693
Group of Twenty (G-20), p. 712
IMF conditionality, p. 704
International Bank for Reconstruction and Development (IBRD or World Bank), p. 693
International Development Association, p. 693
International Finance Corporation (IFC), p. 693
International Monetary Fund (IMF), p. 692
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QUESTIONS FOR REVIEW

1. What is meant by an international monetary system? How can international monetary systems be classified?
2. What are the characteristics of a good international monetary system? How can an international monetary system be evaluated?
3. How was adjustment to balance-of-payments disequilibria under the gold standard explained by Hume? How did adjustment actually take place under the gold standard?
4. What type of international monetary system operated from 1920 to 1924? What happened between 1925 and 1931? What happened after 1931?
5. What are the two basic functions of the International Monetary Fund?
6. What is meant by the Bretton Woods system being a gold-exchange standard? How were exchange rates determined under the Bretton Woods system? Under what conditions were nations allowed to change their exchange rates?

7. What was the procedure for nations to borrow from the IMF?
8. In what way did the Bretton Woods system operate as intended? In what way did it not? How did the Bretton Woods system evolve over the years?
9. What is meant by the General Arrangements to Borrow? standby arrangements? swap arrangements? Special Drawing Rights? gold pool? two-tier gold market?
10. What was meant by the dollar shortage? dollar glut? What were Roosa bonds? What was the purpose of the Interest Equalization Tax and the Foreign Direct Investment Program?
11. What is meant by seigniorage?
12. What was the Smithsonian Agreement? What is meant by the European snake? the dollar standard? adjustment, liquidity, confidence?
13. What was agreed on at the Jamaica Accords?
14. How is the value of the SDR determined today? What additional credit facilities have been set up by the IMF?
15. What are the major problems facing the world today? What is being proposed to solve them?

PROBLEMS

*1. Explain:

(a) How economic conditions today differ from those prevailing under the gold standard period.

(b) Why the different economic conditions today would make the reestablishment of a smoothly working gold standard impossible.

2. With respect to a nation with a $100 million quota in the IMF, indicate how the nation was to pay in its quota to the IMF and the amount that the nation could borrow in any one year under the original rules. How are the rules different today?
3. Explain the procedure whereby the nation of Problem 2 borrowed the maximum amount allowed from the IMF for the first year under the original rules.
4. Explain the procedure whereby the nation of Problem 2 borrowed the maximum amount allowed from the IMF in each year after it had already borrowed the maximum amount allowed in the first year under the original rules.
5. With regard to the nation of Problem 2, explain how and when the nation was to repay its loan to the IMF under the original rules.

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

6. Explain what happens if the nation of Problem 2 (call it Nation A) stops borrowing after the first year, but before it repays its loan, another nation borrows $10 of Nation A's currency from the IMF.

*7. **(a)** Explain how a nation could attempt to discourage large destabilizing international capital inflows under the Bretton Woods system by intervening in the *forward* market.

(b) Can the same be done under the present international monetary system?

*8. **(a)** Explain how a nation could attempt to discourage large destabilizing international capital inflows under the Bretton Woods system by intervening in the *spot* market.

(b) Can the same be done under the present international monetary system?

9. Explain the role of the dollar under the Bretton Woods system.
10. Explain with respect to the Bretton Woods system:

(a) The immediate cause of its collapse.

(b) The fundamental cause of its collapse.

11. Explain briefly the operation of the present international monetary system.
12. **(a)** Explain the fundamental reason for the Mexican currency crisis of December 1994.

(b) How does the International Monetary Fund propose to avoid the recurrence of similar crises in the future?

13. With regard to the Mexican crisis of December 1994, indicate the lesson that it provides (a) for developing countries relying heavily on short-term capital inflows and (b) on how to deal with a currency crisis once it starts.

14. **(a)** Explain the fundamental causes of the economic crises in emerging markets in the second half of the 1990s.

(b) What is being proposed to avoid similar crises in the future?

15. Identify the most significant international economic problems facing the world today.

APPENDIX

A21.1 International Reserves: 1950–2011

In this appendix, we present historical data on the amount of international reserves in terms of SDRs, as reported by the IMF. The IMF includes gold reserves only at the official price of SDR 35 an ounce. Table 21.7 includes gold reserves at SDR market prices. The table also reports the dollar value of one SDR at year end. A few of the totals in the table are subject to very small rounding errors. The SDR market price of gold was practically identical to the official price of SDR 35 per ounce until the two-tier gold market was established in 1968. Note the sharp increase in foreign exchange reserves (mostly dollars) and gold reserves at market prices since the breakdown of the Bretton Woods system in 1971. The decline in SDR reserves in 1992 was due to many IMF members using SDRs to pay for quota increases at the IMF.

Problem (a) Calculate the ratio of the total dollar value of international reserves (with gold measured at market values) to the total dollar value of world imports in 1950, 1955, 1965, 1970, 1980, 1985, 1990, 1995, 2000, 2005, and from 2008–2011. (b) What can you say about the change in international liquidity over the years? (c) Why may international liquidity be excessive under the present international monetary system?

TABLE 21.7. International Reserves, 1950–2011 (billions of SDRs, at year end)

		1950	1955	1960	1965	1966	1967	1968	1969
1.	Foreign exchange	13.3	16.7	18.5	24.0	25.7	29.4	32.6	32.9
2.	SDRs	—	—	—	—	—	—	—	—
3.	Reserve position in the Fund	1.7	1.9	3.6	5.4	6.3	5.7	6.5	6.7
4.	Total reserves minus gold	15.0	18.6	22.1	29.4	32.0	35.2	39.1	39.8
5.	Gold at SDR 35/ounce	32.2	35.0	37.9	41.8	40.8	39.6	38.7	38.9
6.	Total with gold at SDR 35/ounce	48.2	53.6	60.0	71.2	72.8	74.6	77.8	78.7
7.	Gold at SDR market price	33.0	35.0	38.6	41.9	41.1	39.4	46.4	45.7
8.	Total with gold at market price in SDRs	48.0	53.6	60.7	71.3	73.1	74.8	85.5	79.0
9.	U.S. dollars per SDR	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

(continued)

TABLE 21.7. *(continued)*

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
1.	45.1	74.6	95.7	101.8	126.2	137.3	160.2	202.3	222.5	248.6	292.6	291.9
2.	3.1	5.9	8.7	8.8	8.9	8.8	8.7	8.1	8.1	12.5	11.8	16.4
3.	7.7	6.4	6.3	6.2	8.8	12.6	17.7	18.1	14.8	11.8	16.8	21.3
4.	56.2	87.1	110.9	116.8	144.0	158.7	186.6	228.5	245.5	272.9	321.3	329.7
5.	37.0	36.0	35.8	35.9	35.8	35.7	35.5	36.0	36.3	33.1	33.5	33.5
6.	93.2	123.1	146.7	152.7	179.8	194.4	222.2	264.5	281.8	306.0	354.7	363.1
7.	39.6	38.7	52.9	82.6	133.0	140.3	109.1	125.3	154.0	220.5	455.4	406.8
8.	95.8	125.8	163.8	199.4	277.0	299.0	295.7	353.8	399.5	493.8	776.6	736.4
9.	1.0000	1.0857	1.0857	1.2064	1.2244	1.1707	1.1618	1.2417	1.3028	1.3173	1.2754	1.1640

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
1.	284.7	308.8	349.1	347.9	363.8	455.9	494.4	545.1	611.3	646.2	673.3	750.3
2.	17.7	14.4	16.5	18.2	19.5	20.2	20.2	20.5	20.4	20.6	12.9	14.6
3.	25.5	39.1	41.6	38.7	35.3	31.5	28.3	25.5	23.7	25.9	33.9	32.8
4.	327.9	362.3	407.1	404.9	418.7	507.6	542.8	591.1	655.4	692.6	720.1	797.7
5.	33.4	33.3	33.3	33.4	33.3	33.1	33.1	32.9	32.9	32.9	32.5	32.2
6.	361.2	395.6	440.3	438.2	452.0	540.8	576.0	624.0	688.3	725.5	752.6	829.9
7.	324.1	383.4	348.9	274.8	286.0	297.7	307.5	273.0	253.1	237.5	231.6	241.4
8.	652.0	745.7	756.1	679.6	704.6	805.3	850.3	864.0	908.3	929.8	951.7	1,039.0
9.	1.1031	1.0470	0.9802	1.0984	1.2232	1.4187	1.3457	1.3142	1.4227	1.4304	1.3750	1.3736

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1.	812.8	934.9	1,089.2	1,197.9	1,167.6	1,298.3	1,485.8	1,630.6	1,770.9	2,035.5	2,413.4	3,022.5
2.	15.8	19.8	18.5	20.5	20.4	21.5	21.5	21.5	21.5	21.5	21.5	21.5
3.	31.7	36.7	38.0	47.1	60.6	54.8	47.4	56.9	66.1	66.5	55.8	28.6
4.	860.3	991.3	1,145.8	1,265.5	1,248.6	1,371.6	1,551.7	1,707.1	1,856.8	2,122.1	2,489.6	3,071.3
5.	32.0	31.8	31.8	31.2	33.9	37.7*	37.3	37.0	36.6	36.0	35.4	34.7
6.	890.4	1,020.1	1,177.6	1,296.7	1,282.5	1,409.3	1,589.0	1,744.1	1,893.4	2,158.1	2,525.0	3,106.0
7.	240.4	236.1	245.2	218.9	202.3	219.1	228.4	228.0	238.3	251.3	266.3	308.6
8.	1,100.7	1,227.4	1,391.0	1,484.4	1,450.9	1,590.7	1,817.4	1,972.1	2,131.7	2,409.4	2,791.3	3,414.6
9.	1.4599	1.4865	1.4380	1.3493	1.4080	1.3725	1.3029	1.2567	1.3595	1.4860	1.5530	1.4293

	2006	2007	2008	2009	2010	2011
1.	3,491.8	4,242.6	4,769.2	5,207.8	6,014.9	6,644.1
2.	21.5	21.5	21.4	204.0	204.1	204.1
3.	17.5	13.7	25.1	38.7	48.8	98.3
4.	3,527.9	4,275.1	4,813.4	5,447.2	6,263.4	6,935.6
5.	34.3	33.7	33.7	34.3	34.7	35.1
6.	3,562.2	4,308.8	4,847.1	5,481.5	6,298.1	6,970.7
7.	393.5	424.8	545.6	608.8	788.3	1,024.8
8.	3,955.7	4,733.6	5,392.7	6,090.3	7,086.4	7,995.5
9.	1.5044	1.5803	1.5403	1.5677	1.5400	1.5353

*The IMF recalculated amount of its gold holdings.

Source: International Monetary Fund, *International Financial Statistics* (Washington, D.C.: IMF, 1985, 1998, 2002, and 2012).

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INTERNet

Data and analyses of the operation of the present international monetary and trading systems are regularly conducted by the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD), the Bank for International Settlements (BIS), the World Trade Organization (WTO), and the World Bank (WB). Many of these are posted on their web sites at:

http://www.imf.org

http://www.oecd.org

http://www.bis.org

http://www.wto.org

http://www.worldbank.org

For historical exchange rate, interest rate, and price of gold data during the gold standard, see:

http://www.nber.org/databases/macrohistory/contents/index.html

For the operation of the international monetary system and International Monetary Fund, as well as proposals for reforms of the international monetary system, see:

http://www.imf.org/external/pubs/ft/weo/2011/01/index.htm

To compare price discipline under fixed and flexible exchange rate systems, examine historical CPI data for various countries at:

http://www.economagic.com/blsint.htm

For the Special Drawing Rights (SDR) "valuation basket: percentage weights," see:

http://www.imf.org/external/np/exr/facts/sdr.htm

GDP and trade data are found at:

http://www.worldbank.org

http://www.wto.org

Financial data on emerging markets and their crises are found at:

http://www.worldbank.org

http://www.emgmkts.com

http://www.roubini.com