



# CHAPTER 19

## Macroeconomic Policy and Coordination Under Floating Exchange Rates

As the Bretton Woods system of fixed exchange rates began to show signs of strain in the late 1960s, many economists recommended that countries allow currency values to be determined freely in the foreign exchange market. When the governments of the industrialized countries adopted floating exchange rates early in 1973, they viewed their step as a temporary emergency measure and were not consciously following the advice of the economists then advocating a permanent floating-rate system. It proved impossible, however, to put the fixed-rate system back together again: The dollar exchange rates of the industrialized countries have continued to float since 1973.

The advocates of floating saw it as a way out of the conflicts between internal and external balance that often arose under the rigid Bretton Woods exchange rates. By the mid-1980s, however, economists and policy makers had become more skeptical about the benefits of an international monetary system based on floating rates. The harshest critics describe the post-1973 currency arrangements as an international monetary “nonsystem,” a free-for-all in which national macroeconomic policies are frequently at odds. These observers think that the current exchange rate system is badly in need of reform, although others believe floating exchange rates have been largely successful.

Why has the performance of floating rates been controversial? In this chapter our models of fixed and floating exchange rates are applied to examine the recent performance of floating rates and to compare the macroeconomic policy problems of different exchange rate regimes.

### Learning Goals

After reading this chapter, you will be able to:

- Explain the reasons many economists favor an international financial system based on floating dollar exchange rates and the counterarguments of the critics of floating.

- Discuss how commodity-price and policy disturbances raised inflation and unemployment in the early years of floating exchange rates (1973–1980).
- Summarize how the monetary and fiscal policies of a large country such as the United States are transmitted abroad.
- Describe the effects of the disinflationary and fiscal policies followed by the United States in the 1980s and the role of international policy coordination.
- Discuss how the world economy has performed in recent years and what lessons the post-1973 experience holds for reform of the international monetary system.

## The Case for Floating Exchange Rates

As international currency crises of increasing scope and frequency erupted in the late 1960s, most economists began advocating greater flexibility of exchange rates. Many argued that a system of floating exchange rates (one in which central banks did not intervene in the foreign exchange market to fix rates) would not only deliver necessary exchange rate flexibility but would also produce several other benefits for the world economy. The case for floating exchange rates rested on three major claims:

1. *Monetary policy autonomy.* If central banks were no longer obliged to intervene in currency markets to fix exchange rates, governments would be able to use monetary policy to reach internal and external balance. Furthermore, no country would be forced to import inflation (or deflation) from abroad.
2. *Symmetry.* Under a system of floating rates the inherent asymmetries of Bretton Woods would disappear and the United States would no longer be able to set world monetary conditions all by itself. At the same time, the United States would have the same opportunity as other countries to influence its exchange rate against foreign currencies.
3. *Exchange rates as automatic stabilizers.* Even in the absence of an active monetary policy, the swift adjustment of market-determined exchange rates would help countries maintain internal and external balance in the face of changes in aggregate demand. The long and agonizing periods of speculation preceding exchange rate realignments under the Bretton Woods rules would not occur under floating.

### Monetary Policy Autonomy

Under the Bretton Woods fixed-rate system, countries other than the United States had little scope to use monetary policy to attain internal and external balance. Countries could hold their dollar exchange rates fixed only if they kept the domestic interest rate in line with that of the United States. Thus, in the closing years of fixed exchange rates, central banks imposed increasingly stringent restrictions on international payments to keep control over their interest rates and money supplies. These restrictions were only partially successful in strengthening monetary policy, and they had the damaging side effect of distorting international trade.

Advocates of floating rates pointed out that removal of the obligation to peg currency values would restore monetary control to central banks. If, for example, the central bank faced unemployment and wished to expand its money supply in response, there would no longer be any legal barrier to the currency depreciation this would cause. Similarly, the central bank of an overheated economy could cool down activity by contracting the money supply without worrying that undesired reserve inflows would undermine its stabilization effort.

Enhanced control over monetary policy would allow countries to dismantle their distorting barriers to international payments.

Advocates of floating also argued that floating rates would allow each country to choose its own desired long-run inflation rate rather than passively importing the inflation rate established abroad. We saw in the last chapter that a country faced with a rise in the foreign price level will be thrown out of balance and ultimately will import the foreign inflation if it holds its exchange rate fixed. By the end of the 1960s many countries felt that they were importing inflation from the United States. By revaluing its currency—that is, by lowering the domestic currency price of foreign currency—a country can insulate itself completely from an inflationary increase in foreign prices, and so remain in internal and external balance. One of the most telling arguments in favor of floating rates was their ability, in theory, to bring about automatically exchange rate changes that insulate economies from ongoing foreign inflation.

The mechanism behind this insulation is purchasing power parity (Chapter 15). Recall that when all changes in the world economy are monetary, PPP holds true in the long run: Exchange rates eventually move to offset exactly national differences in inflation. If U.S. monetary growth leads to a long-run doubling of the U.S. price level, while Europe's price level remains constant, PPP predicts that the long-run euro price of the dollar will be halved. This nominal exchange rate change leaves the *real* exchange rate between the dollar and euro unchanged and thus maintains Europe's internal and external balance. In other words, the long-run exchange rate change predicted by PPP is exactly the change that insulates Europe from U.S. inflation.

A money-induced increase in U.S. prices also causes an *immediate* appreciation of foreign currencies against the dollar when the exchange rate floats. In the short run, the size of this appreciation can differ from what PPP predicts, but the foreign exchange speculators who might have mounted an attack on fixed dollar exchange rates speed the adjustment of floating rates. Since they know foreign currencies will appreciate according to PPP in the long run, they act on their expectations and push exchange rates in the direction of their long-run levels.

Countries operating under the Bretton Woods rules were forced to choose between matching U.S. inflation to hold their dollar exchange rates fixed or deliberately revaluing their currencies in proportion to the rise in U.S. prices. Under floating, however, the foreign exchange market automatically brings about exchange rate changes that shield countries from U.S. inflation. Since this outcome does not require any government policy decisions, the revaluation crises that occurred under fixed exchange rates are avoided.<sup>1</sup>

## Symmetry

The second argument put forward by the advocates of floating was that abandonment of the Bretton Woods system would remove the asymmetries that caused so much international disagreement in the 1960s and early 1970s. There were two main asymmetries, both the result of the dollar's central role in the international monetary system. First, because central banks pegged their currencies to the dollar and accumulated dollars as international reserves, the U.S. Federal Reserve played the leading role in determining the world money supply and central banks abroad had little scope to determine their own domestic money supplies. Second, any foreign country could devalue its currency against the dollar in conditions of "fundamental disequilibrium," but the system's rules did not give the United States the option of devaluing against foreign currencies. Thus, when the dollar was at last

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<sup>1</sup>Countries can also avoid importing undesired *deflation* by floating, since the analysis above goes through, in reverse, for a fall in the foreign price level.

devalued in December 1971, it was only after a long and economically disruptive period of multilateral negotiation.

A system of floating exchange rates would do away with these asymmetries. Since countries would no longer peg dollar exchange rates, each would be in a position to guide monetary conditions at home. For the same reason, the United States would not face any special obstacle to altering its exchange rate through monetary or fiscal policies. All countries' exchange rates would be determined symmetrically by the foreign exchange market, not by government decisions.<sup>2</sup>

### Exchange Rates as Automatic Stabilizers

The third argument in favor of floating rates concerned their ability, theoretically, to promote swift and relatively painless adjustment to certain types of economic changes. One such change, previously discussed, is foreign inflation. Figure 19-1, which uses the *DD-AA* model presented in Chapter 16, examines another type of change by comparing an economy's response under a fixed and a floating exchange rate to a temporary fall in foreign demand for its exports.

A fall in demand for the home country's exports reduces aggregate demand for every level of the exchange rate,  $E$ , and so shifts the *DD* schedule leftward from  $DD^1$  to  $DD^2$ . (Recall that the *DD* schedule shows exchange rate and output pairs for which aggregate demand equals aggregate output.) Figure 19-1a shows how this shift affects the economy's equilibrium when the exchange rate floats. Because the demand shift is assumed to be temporary, it does not change the long-run expected exchange rate and so does not move the asset market equilibrium schedule  $AA^1$ . (Recall that the *AA* schedule shows exchange rate and output pairs at which the foreign exchange market and the domestic money market are in equilibrium.) The economy's short-run equilibrium is therefore at point 2; compared with the initial equilibrium at point 1, the currency depreciates ( $E$  rises) and output falls. Why does the exchange rate rise from  $E^1$  to  $E^2$ ? As demand and output fall, reducing the transactions demand for money, the home interest rate must also decline to keep the money market in equilibrium. This fall in the home interest rate causes the domestic currency to depreciate in the foreign exchange market, and the exchange rate therefore rises from  $E^1$  to  $E^2$ .

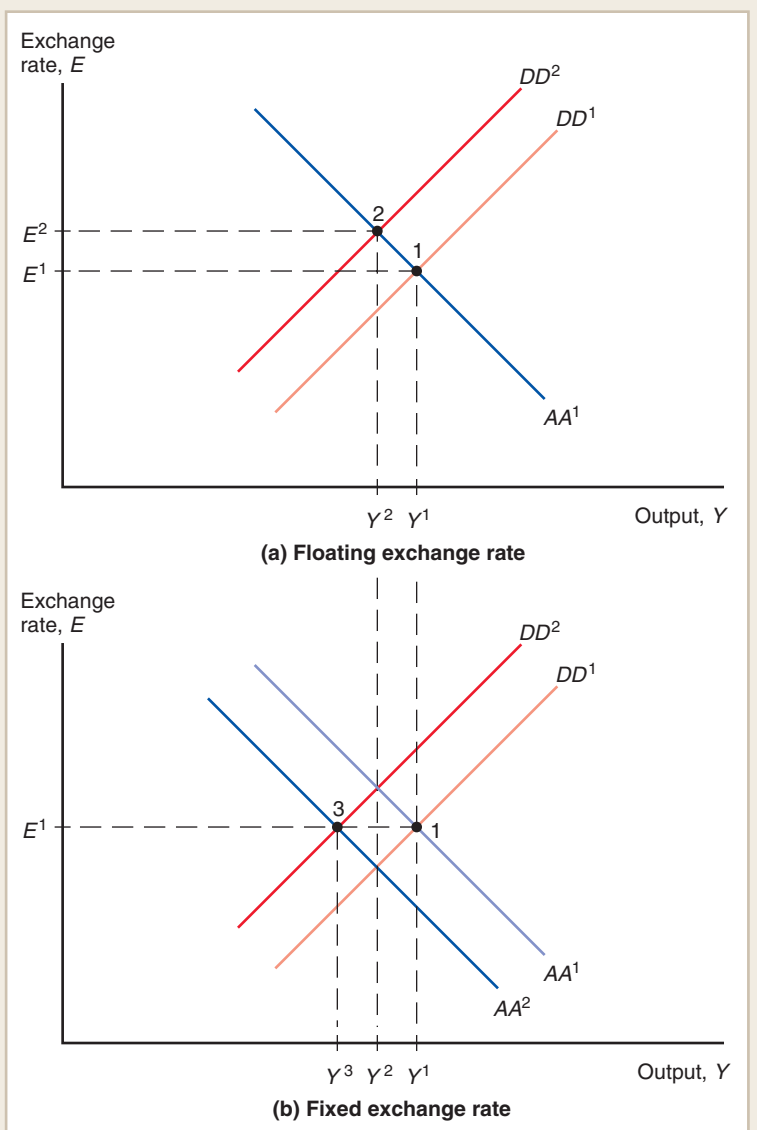
The effect of the same export demand disturbance under a fixed exchange rate is shown in Figure 19-1b. Since the central bank must prevent the currency depreciation that occurs under a floating rate, it buys domestic money with foreign reserves, an action that contracts the money supply and shifts  $AA^1$  left to  $AA^2$ . The new short-run equilibrium of the economy under a fixed exchange rate is at point 3, where output equals  $Y^3$ .

Figure 19-1 shows that output actually falls more under a fixed rate than under a floating rate, dropping all the way to  $Y^3$  rather than  $Y^2$ . In other words, the movement of the floating exchange rate stabilizes the economy by reducing the shock's effect on employment relative to its effect under a fixed rate. Currency depreciation in the floating rate case makes domestic goods and services cheaper when the demand for them falls, partially offsetting the initial reduction in demand. In addition to reducing the departure from internal balance caused by the fall in export demand, the depreciation reduces the current account deficit that occurs under fixed rates by making domestic products more competitive in international markets.

<sup>2</sup>The symmetry argument is not an argument against fixed-rate systems in general, but an argument against the specific type of fixed exchange rate system that broke down in the early 1970s. As we saw in Chapter 17, a fixed-rate system based on an international gold standard can be completely symmetric.

**Figure 19-1****Effects of a Fall in Export Demand**

The response to a fall in export demand (seen in the shift from  $DD^1$  to  $DD^2$ ) differs under floating and fixed exchange rates. (a) With a floating rate, output falls only to  $Y^2$  as the currency's depreciation (from  $E^1$  to  $E^2$ ) shifts demand back toward domestic goods. (b) With the exchange rate fixed at  $E^1$ , output falls all the way to  $Y^3$  as the central bank reduces the money supply (reflected in the shift from  $AA^1$  to  $AA^2$ ).



We have considered the case of a transitory fall in export demand, but even stronger conclusions can be drawn when there is a *permanent* fall in export demand. In this case, the expected exchange rate  $E^e$  also rises and  $AA$  shifts upward as a result. A permanent shock causes a greater depreciation than a temporary one, and the movement of the exchange rate therefore cushions domestic output more when the shock is permanent.

Under the Bretton Woods system, a fall in export demand such as the one shown in Figure 19-1b would, if permanent, have led to a situation of “fundamental disequilibrium” calling for a devaluation of the currency or a long period of domestic unemployment as wages and prices fell. Uncertainty about the government’s intentions would have encouraged speculative capital outflows, further worsening the situation by depleting

central bank reserves and contracting the domestic money supply at a time of unemployment. Advocates of floating rates pointed out that the foreign exchange market would automatically bring about the required *real* currency depreciation through a movement in the nominal exchange rate. This exchange rate change would reduce or eliminate the need to push the price level down through unemployment, and because it would occur immediately there would be no risk of speculative disruption, as there would be under a fixed rate.

## The Case Against Floating Exchange Rates

The experience with floating exchange rates between the world wars had left many doubts about how they would function in practice if the Bretton Woods rules were scrapped. Some economists were skeptical of the claims advanced by the advocates of floating and predicted instead that floating rates would have adverse consequences for the world economy. The case against floating rates rested on five main arguments:

1. *Discipline.* Central banks freed from the obligation to fix their exchange rates might embark on inflationary policies. In other words, the “discipline” imposed on individual countries by a fixed rate would be lost.
2. *Destabilizing speculation and money market disturbances.* Speculation on changes in exchange rates could lead to instability in foreign exchange markets, and this instability, in turn, might have negative effects on countries’ internal and external balances. Further, disturbances to the home money market could be more disruptive under floating than under a fixed rate.
3. *Injury to international trade and investment.* Floating rates would make relative international prices more unpredictable and thus injure international trade and investment.
4. *Uncoordinated economic policies.* If the Bretton Woods rules on exchange rate adjustment were abandoned, the door would be opened to competitive currency practices harmful to the world economy. As happened during the interwar years, countries might adopt policies without considering their possible beggar-thy-neighbor aspects. All countries would suffer as a result.
5. *The illusion of greater autonomy.* Floating exchange rates would not really give countries more policy autonomy. Changes in exchange rates would have such pervasive macroeconomic effects that central banks would feel compelled to intervene heavily in foreign exchange markets even without a formal commitment to peg. Thus, floating would increase the uncertainty in the economy without really giving macroeconomic policy greater freedom.

### Discipline

Some critics of floating rates believed that they would lead to license rather than liberty for domestic monetary policy: Freed of the need to worry about losses of foreign reserves, governments might embark on overexpansionary fiscal or monetary policies, falling into the inflation bias trap discussed in Chapter 16 (p. 440). Factors ranging from political objectives (such as stimulating the economy in time to win an election) to simple incompetence might set off an inflationary spiral.

The pro-floaters’ response to the discipline criticism was that a floating exchange rate would bottle up inflationary disturbances within the country whose government was misbehaving. It would then be up to its voters, if they wished, to elect a government with better policies.

## Destabilizing Speculation and Money Market Disturbances

An additional concern arising out of the experience of the interwar period was the possibility that speculation in currency markets might fuel wide gyrations in exchange rates. If foreign exchange traders saw that a currency was depreciating, it was argued, they might sell the currency in the expectation of future depreciation regardless of the currency's longer-term prospects; and as more traders jumped on the bandwagon by selling the currency, the expectations of depreciation would be realized. Such **destabilizing speculation** would tend to accentuate the fluctuations around the exchange rate's long-run value that would occur normally as a result of unexpected economic disturbances. Aside from interfering with international trade, destabilizing sales of a weak currency might encourage expectations of future inflation and set off a domestic wage-price spiral that would encourage further depreciation. Countries could be caught in a "vicious circle" of depreciation and inflation that might be difficult to escape.

Advocates of floating rates questioned whether destabilizing speculators could stay in business. Anyone who persisted in selling a currency after it had depreciated below its long-run value or in buying a currency after it had appreciated above its long-run value was bound to lose money over the long term. Destabilizing speculators would thus be driven from the market, the pro-floaters argued, and the field would be left to speculators who had avoided long-term losses by speeding the adjustment of exchange rates *toward* their long-run values.

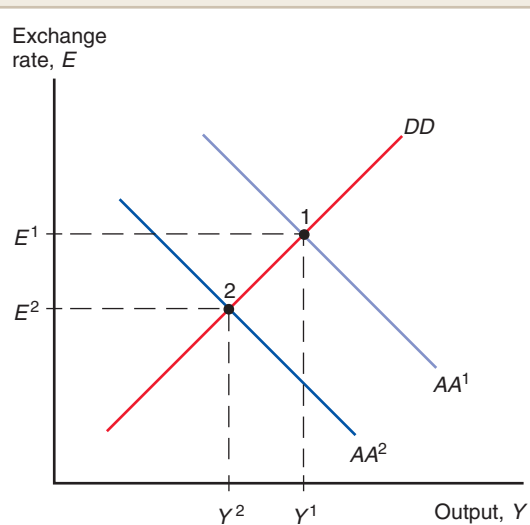
Proponents of floating also pointed out that capital flows could behave in a destabilizing manner under fixed rates. An unexpected central bank reserve loss might set up expectations of a devaluation and spark a reserve hemorrhage as speculators dumped domestic currency assets. Such capital flight might actually force an unnecessary devaluation if government measures to restore confidence proved insufficient.

A more telling argument against floating rates is that they make the economy more vulnerable to shocks coming from the domestic money market. Figure 19-2 uses the *DD-AA* model to illustrate this point. The figure shows the effect on the economy of a rise in real domestic money demand (that is, a rise in the real balances people desire to hold at each level of the interest rate and income) under a floating exchange rate. Because a lower level of income is now needed (given  $E$ ) for people to be content to hold the available real

**Figure 19-2**

### A Rise in Money Demand Under a Floating Exchange Rate

A rise in money demand (the shift from  $AA^1$  to  $AA^2$ ) works exactly like a fall in the money supply, causing the currency to appreciate to  $E^2$  and output to fall to  $Y^2$ . Under a fixed exchange rate the central bank would prevent  $AA^1$  from shifting by purchasing foreign exchange and thus automatically expanding the money supply to meet the rise in money demand.



money supply,  $AA^1$  shifts leftward to  $AA^2$ : Income falls from  $Y^1$  to  $Y^2$  as the currency appreciates from  $E^1$  to  $E^2$ . The rise in money demand works exactly like a fall in the money supply, and if it is permanent it will lead eventually to a fall in the home price level. Under a fixed exchange rate, however, the change in money demand does not affect the economy at all. To prevent the home currency from appreciating, the central bank buys foreign reserves with domestic money until the real money supply rises by an amount equal to the rise in real money demand. This intervention has the effect of keeping  $AA^1$  in its original position, preventing any change in output or the price level.

A fixed exchange rate therefore automatically prevents instability in the domestic money market from affecting the economy. This is a powerful argument in favor of fixed rates *if* most of the shocks that buffet the economy come from the home money market (that is, if they result from shifts in  $AA$ ). But as we saw in the previous section, fixing the exchange rate will worsen macroeconomic performance on average if output market shocks (that is, shocks involving shifts in  $DD$ ) predominate.

### Injury to International Trade and Investment

Critics of floating also charged that the inherent variability of floating exchange rates would injure international trade and investment. Fluctuating currencies make importers more uncertain about the prices they will have to pay for goods in the future and make exporters more uncertain about the prices they will receive. This uncertainty, it was claimed, would make it costlier to engage in international trade, and as a result trade volumes—and with them the gains countries realize through trade—would shrink. Similarly, greater uncertainty about the payoffs on investments might interfere with productive international capital flows.

Supporters of floating countered that international traders could avoid exchange rate risk through transactions in the forward exchange market (see Chapter 13), which would grow in scope and efficiency in a floating-rate world.

At a more general level, opponents of floating rates feared that the usefulness of each country's money as a guide to rational planning and calculation would be reduced. A currency becomes less useful as a unit of account if its purchasing power over imports becomes less predictable.

### Uncoordinated Economic Policies

Some defenders of the Bretton Woods system thought that its rules had helped promote orderly international trade by outlawing the competitive currency depreciations that occurred during the Great Depression. With countries once again free to alter their exchange rates at will, they argued, history might repeat itself. Countries might again follow self-serving macroeconomic policies that hurt all countries and, in the end, helped none.

In rebuttal, the pro-floaters replied that the Bretton Woods rules for exchange rate adjustment were cumbersome. In addition, the rules were inequitable because, in practice, it was deficit countries that came under pressure to adopt restrictive macroeconomic policies or devalue. The fixed-rate system had “solved” the problem of international cooperation on monetary policy only by giving the United States a dominant position that it ultimately abused.

### The Illusion of Greater Autonomy

A final line of criticism held that the policy autonomy promised by the advocates of floating rates was, in part, illusory. True, a floating rate could in theory shut out foreign inflation over the long haul and allow central banks to set their money supplies as they pleased. But, it was argued, the exchange rate is such an important macroeconomic variable that policy



makers would find themselves unable to take domestic monetary policy measures without considering their effects on the exchange rate.

Particularly important to this view was the role of the exchange rate in the domestic inflation process. A currency depreciation that raised import prices might induce workers to demand higher wages to maintain their customary standard of living. Higher wage settlements would then feed into final goods prices, fueling price level inflation and further wage hikes. In addition, currency depreciation would immediately raise the prices of imported goods used in the production of domestic output. Therefore, floating rates could be expected to quicken the pace at which the price level responded to increases in the money supply. While floating rates implied greater central bank control over the nominal money supply,  $M^s$ , they did not necessarily imply correspondingly greater control over the policy instrument that affects employment and other real economic variables, the *real* money supply,  $M^s/P$ . The response of domestic prices to exchange rate changes would be particularly rapid in economies where imports make up a large share of the domestic consumption basket: In such countries, currency changes have significant effects on the purchasing power of workers' wages.

The skeptics also maintained that the insulating properties of a floating rate are very limited. They conceded that the exchange rate would adjust *eventually* to offset foreign price inflation due to excessive monetary growth. In a world of sticky prices, however, countries are nonetheless buffeted by foreign monetary developments, which affect real interest rates and real exchange rates in the short run. Further, there is no reason, even in theory, why one country's fiscal policies cannot have repercussions abroad.

Critics of floating thus argued that its potential benefits had been oversold relative to its costs. Macroeconomic policy makers would continue to labor under the constraint of avoiding excessive exchange rate fluctuations. But by abandoning fixed rates, they would have forgone the benefits for world trade and investment of predictable currency values.

## Case Study

### Exchange Rate Experience Between the Oil Shocks, 1973–1980

Which group was right, the advocates of floating rates or the critics? In this Case Study and the next we survey the experience with floating exchange rates since 1973 in an attempt to answer this question. To avoid future disappointment, however, it is best to state up front that, as is often the case in economics, the data do not lead to a clear verdict. Although a number of predictions made by the critics of floating were borne out by subsequent events, it is also unclear whether a regime of fixed exchange rates would have survived the series of economic storms that has shaken the world economy since 1973.

#### The First Oil Shock and Its Effects, 1973–1975

In October 1973 war broke out between Israel and the Arab countries. To protest support of Israel by the United States and the Netherlands, Arab members of the Organization of Petroleum Exporting Countries (OPEC), an international cartel including most large oil producers, imposed an embargo on oil shipments to those two countries. Fearing more general disruptions in oil shipments, buyers bid up market oil prices as they tried to build precautionary inventories. Encouraged by these developments in the oil market, OPEC countries began raising the price they charged to their main customers, the large oil companies. By March 1974 the oil price had quadrupled from its prewar price of \$3 per barrel to \$12 per barrel. This price may seem low compared to the current price of

**TABLE 19-1** Macroeconomic Data for Key Industrial Regions, 1963–2006

Period	1963–1972	1973–1982	1983–1992	1993–2003	2004	2005	2006
<b>Inflation (percent per year)</b>							
United States	3.3	8.7	4.0	2.6	2.7	3.4	3.2
Europe	4.4	10.7	5.1	2.4	2.3	2.3	2.3
Japan	5.6	8.6	1.8	0.2	0.0	−0.3	−0.2
<b>Unemployment (percent of labor force)</b>							
United States	4.7	7.0	6.8	5.4	5.5	5.1	4.6
Europe	1.9	5.5	9.4	9.5	9.0	8.7	7.9
Japan	1.2	1.9	2.5	4.0	4.7	4.4	4.1
<b>Per Capita Real GDP Growth (percent per year)</b>							
United States	2.8	0.9	2.4	2.1	3.9	3.2	3.3
Europe	3.9	2.0	3.0	2.0	1.8	1.0	2.3
Japan	8.5	2.9	3.4	0.8	2.7	1.9	2.2

**Source:** International Monetary Fund. Some data are IMF forecasts.

nearly \$100 per barrel, but a dollar was worth more in real terms in 1974, and people had become accustomed to very cheap energy. Consumption and investment slowed down everywhere and the world economy was thrown into recession. The current account balances of oil-importing countries worsened.

The model we developed in Chapters 13 through 17 predicts that inflation tends to rise in boom periods and fall in recessions. As the world went into deep recession in 1974, however, inflation accelerated in most countries. Table 19-1 shows how inflation in the main industrial regions spurted upward in the decade 1973–1982, even though unemployment was rising.



What happened? An important contributing factor was the oil shock itself: By directly raising the prices of petroleum products and the costs of energy-using industries, the increase in the oil price caused price levels to jump upward. Further, the worldwide inflationary pressures that had built up since the end of the 1960s had become entrenched in the wage-setting process and were continuing to contribute to inflation in spite of the deteriorating employment picture. The same inflationary expectations that were driving new wage contracts were also putting additional upward pressure on commodity prices as speculators built up stocks of commodities whose prices they expected to rise. Over the following years, central bankers proved unwilling to combat these inflationary pressures at the cost of yet-higher unemployment.

To describe the unusual macroeconomic conditions of 1974–1975, economists coined a new word that has since become commonplace: **stagflation**, a combination of stagnating output and high inflation. Stagflation was the result of two factors:

1. Increases in commodity prices that directly raised inflation while at the same time depressing aggregate demand and supply.

2. Expectations of future inflation that fed into wages and other prices in spite of recession and rising unemployment.

The commodity shocks left most oil-importing countries further from both internal and external balance than they were when floating began in 1973. Countries were in no position to give up the expenditure-switching advantages of exchange rate flexibility and burden monetary policy with the job of defending a fixed rate. No commitment to fixed rates would have been credible in a period when countries were experiencing such different inflation rates and suffering shocks that permanently altered production costs. The speculative attacks that had brought the fixed-rate system down would have quickly undermined any attempt to fix parities anew.

How did countries use their policy tools to regain internal and external balance? As the recession deepened over 1974 and early 1975, most governments shifted to expansionary fiscal and monetary policies. In the seven largest industrial countries, monetary growth rates rose between 1974 and 1975 as central banks reacted to rising unemployment. As a result of these policy actions, a strong output recovery was underway in most industrialized countries by the second half of 1975. Unfortunately, however, the unemployment rates of industrialized countries failed to return to pre-recession levels even as output recovered.

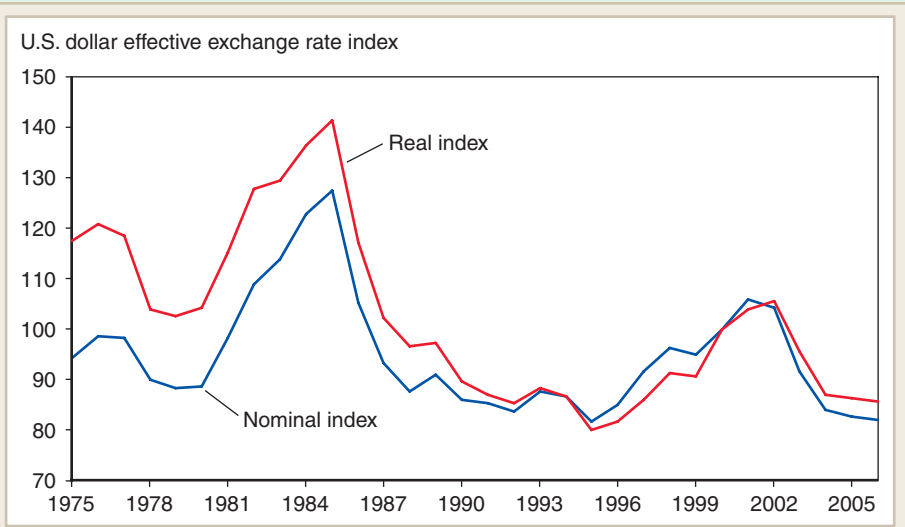
The 1974 current account deficit of the industrial countries, taken as a group, turned to a surplus in 1975 as spending fell and was near zero in 1976. The OPEC countries, which could not raise spending quickly enough to match their increased income, were running a substantial current account surplus in 1975 and 1976, but this was matched by the deficit of the oil-importing developing countries. Because the non-oil-developing countries did not cut their spending as sharply as industrial countries, GNP growth in developing countries as a group did not become negative in 1975, as it did in many developed countries. The developing countries financed their oil deficits in part by borrowing funds that the OPEC countries had deposited in the industrial countries' financial centers.

Freed of the need to defend a fixed exchange rate, each government had chosen the monetary and fiscal response that best suited its goals. The United States and Germany had even been able to relax the capital controls they had set up before 1974. This relaxation eased the adjustment problem of the developing countries, which were able to borrow more easily from developed-country financial markets to maintain their own spending and economic growth. In turn, the relative strength of the developing world's demand for industrial country exports helped mitigate the severity of the 1974–1975 recession.

### **The Weak Dollar, 1976–1979**

As the recovery from the 1974–1975 recession slowed in late 1976 and unemployment remained persistently high, the United States urged the two other industrial giants, Germany and Japan, to join it in adopting expansionary policies that would pull the world economy out of its doldrums. Only in 1978 did Germany and Japan, less fearful of inflation than they had been two years earlier, agree to join the United States as “locomotives” of world economic growth. Until then, the United States had been attempting to go it alone, and its policies, while causing a sharp drop in the U.S. unemployment rate (to 6.0 percent in 1978 from a recession high of 8.3 percent in 1975), had reignited inflation and pushed the U.S. current account into deficit.

The result of this policy imbalance—vigorous expansion in the United States unmatched by expansion abroad—was a steep depreciation of the dollar starting in 1976. The depreciation of the dollar in these years is evident in Figure 19-3, which



**Figure 19-3**  
**Nominal and Real Effective Dollar Exchange Rate Indexes, 1975–2006**

The indexes are measures of the nominal and real value of the U.S. dollar in terms of a basket of foreign currencies. An increase in the indexes is a dollar appreciation, a decrease a dollar depreciation. For both indexes, the 2000 value is 100.

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

shows both **nominal and real effective exchange rate indexes** of the dollar. These indexes measure, respectively, the price of a dollar in terms of a basket of foreign currencies and the price of U.S. output in terms of a basket of foreign outputs. Thus, a rise in either index is a (nominal or real) dollar appreciation, while a fall is a depreciation.

International investors had little confidence in the dollar’s future value in view of the widening gap between U.S. and foreign inflation rates. To restore faith in the dollar, President Jimmy Carter appointed a new Federal Reserve Board chairman with broad experience in international financial affairs, Paul A. Volcker. The dollar began to strengthen in October 1979, when Volcker announced a tightening of U.S. monetary policy and the adoption by the Fed of more stringent procedures for controlling money supply growth.

The sharp U.S. monetary turnaround of 1979 illustrated the truth of one point made by the critics of floating exchange rates. Governments could not be indifferent to the behavior of exchange rates and inevitably surrendered some of their policy autonomy in other areas to prevent exchange rate movements they viewed as harmful to their economies.

**The Second Oil Shock, 1979–1980**

The fall of the shah of Iran in 1979 sparked a second round of oil price increases by disrupting oil exports from that country. Oil prices rose from around \$13 per barrel in 1978 to nearly \$32 per barrel in 1980. As they had after the 1973–1974 episode, oil-importing economies faced stagflation. Oil-importing developing countries, like the developed countries, experienced higher inflation coupled with slower growth.

In 1975 macroeconomic policy makers in the industrial countries had responded to the first oil shock with expansionary monetary and fiscal policies. They responded very

differently to the second oil shock. Over 1979 and 1980, monetary growth was actually *restricted* in most major industrial countries in an attempt to offset the rise in inflation accompanying the oil price increase. After struggling to reduce the higher inflation of the early 1970s, central banks were now worried that the 1978–1980 upswing in inflation might be hard to reverse later if it were allowed to be built into inflationary expectations and the wage-setting process.

The fight against inflation had a high price in terms of employment and output, and restrictive macroeconomic policies blocked a decisive output recovery. In fact, the recovery from the oil shock barely had time to start up before the world economy, in 1981, plunged into the deepest recession since the Great Depression of the 1930s.

## Macroeconomic Interdependence Under a Floating Rate

Up until now, our modeling of the open economy has focused on the relatively simple case of a small country that cannot affect foreign output, price levels, or interest rates through its own monetary and fiscal policies. That description obviously does not fit the United States, however, with a national output level equal to about a fifth of the world's total product. To discuss macroeconomic interactions between the United States and the rest of the world, we therefore must think about the transmission of policies between countries linked by a floating exchange rate. We will offer a brief and intuitive discussion rather than a formal model, and restrict ourselves to the short run in which we can assume that nominal output prices are fixed.

Imagine a world economy made up of two large countries, Home and Foreign. Our goal is to evaluate how Home's macroeconomic policies affect Foreign. The main complication is that neither country can be thought of any longer as facing a fixed external interest rate or a fixed level of foreign export demand. To simplify, we consider only the case of *permanent* shifts in monetary and fiscal policy.

Let's look first at a permanent monetary expansion by Home. We know that in the small-country case (Chapter 16), Home's currency would depreciate and its output would rise. The same happens when Home's economy is large, but now, the rest of the world is affected too. Because Home is experiencing a real currency depreciation, Foreign must be experiencing a real currency *appreciation*, which makes Foreign goods relatively expensive and thus has a depressing effect on Foreign output. The increase in Home output, however, works in the opposite direction, since Home spends some of its extra income on Foreign goods and, on that account, aggregate demand for Foreign output rises. Home's monetary expansion therefore has two opposing effects on Foreign output, with the net result depending on which effect is the stronger. Foreign output may rise or fall.<sup>3</sup>

Next let's think about a permanent expansionary fiscal policy in Home. In the small-country case of Chapter 16, a permanent fiscal expansion caused a real currency appreciation and a current account deterioration that fully nullified any positive effect on aggregate demand. In effect, the expansionary impact of the Home fiscal ease leaked entirely abroad

<sup>3</sup>The Foreign money market equilibrium condition is  $M^*/P^* = L(R^*, Y^*)$ . Because  $M^*$  is not changing and  $P^*$  is sticky and therefore fixed in the short run, Foreign output can rise only if the Foreign nominal interest rate rises too and can fall only if the Foreign nominal interest rate falls.



United States, hastening the decline of inflation there. The tight U.S. monetary policy therefore had a beggar-thy-neighbor effect abroad, in that it lowered American inflation in part by exporting inflation to foreign economies.

Foreign central banks responded by intervening in the currency markets to slow the dollar's rise. Through the process of selling dollar reserves and buying their own currencies, some central banks reduced their monetary growth rates for 1980 and 1981, driving interest rates upward.

Synchronized monetary contraction in the United States and abroad, following fast on the heels of the second oil shock, threw the world economy into a deep recession, the most severe since the Great Depression of the 1930s. In 1982 and 1983, unemployment throughout the world rose to levels unprecedented in the post-World War II period. While U.S. unemployment quickly returned to its pre-recession level, unemployment in Japan and especially in Europe remained permanently higher (see Table 19-1). Monetary contraction and the recession it brought quickly led, however, to a dramatic drop in the inflation rates of industrialized countries.

### Fiscal Policies, the Current Account, and the Resurgence of Protectionism

During his election campaign, President Reagan had promised to lower taxes and balance the federal budget. He made good on the first of these promises in 1981. At the same time, the Reagan administration pushed for an acceleration of defense spending. The net result of these and subsequent Congressional actions was a ballooning U.S. government budget deficit and a sharp fiscal stimulus to the economy.

An analysis of U.S. fiscal moves is complicated because the fiscal policy mandated in 1981 was a phased one that began only in 1982, and its expansionary impact was probably not felt fully until 1983. The *anticipation* of future fiscal expansion in 1981 would simply have appreciated the dollar, thereby deepening the early stages of the 1981–1983 recession in the United States. Only by late 1982 or 1983 can we draw on the last section's discussion to conclude that U.S. fiscal expansion stimulated output both at home and abroad.

All along, however, the U.S. fiscal stance encouraged continuing dollar appreciation (see Figure 19-3), as did contractionary fiscal policies pursued at the time by Germany and Japan. By February 1985, the dollar's cumulative appreciation against the German currency since the end of 1979 was 47.9 percent. The recession reached its low point in the United States in December 1982, and output began to recover both there and abroad as the U.S. fiscal stimulus was transmitted to foreign countries through the dollar's steady appreciation. Also contributing to the recovery was a looser Federal Reserve monetary policy.

While the U.S. fiscal expansion contributed to world recovery, growing federal budget deficits raised serious worries about the future stability of the world economy. Increasing government deficits were not met with offsetting increases in private saving or decreases in investment, so the American current account balance deteriorated sharply. By 1987, the United States had become a net debtor to foreign countries and its current account deficit was at the (then) postwar record level of 3.6 percent of GNP. Some analysts worried that foreign creditors would lose confidence in the future value of the dollar assets they were accumulating and sell them, causing a sudden, precipitous dollar depreciation.

Equally worrisome was the strong dollar's impact on the distribution of income within the United States. The dollar's appreciation had reduced U.S. inflation and allowed consumers to purchase imports more cheaply, but those hurt by the terms of trade change were better organized and more vocal than those who had benefited. Persistently poor economic performance in the 1980s had led to increased pressures on governments to

protect industries in import-competing sectors. As the U.S. recovery slowed late in 1984, protectionist pressures snowballed.

The Reagan administration had, from the start, adopted a policy of “benign neglect” toward the foreign exchange market, refusing to intervene except in unusual circumstances (for example, after a would-be assassin shot President Reagan). By 1985, however, the link between the strong dollar and the gathering protectionist storm became impossible to ignore.

Fearing a disaster for the international trading system, economic officials of the United States, Britain, France, Germany, and Japan announced at New York’s Plaza Hotel on September 22, 1985, that they would jointly intervene in the foreign exchange market to bring about a dollar depreciation. The dollar dropped sharply the next day and continued to decline through 1986 and early 1987 as the United States maintained a loose monetary policy and pushed dollar interest rates down relative to foreign currency rates. (See Figure 19-3.)

### Global Slump Once Again, Recovery, Crisis, and Deficits

Toward the end of the 1980s inflationary pressures reappeared in the main industrial countries. Inflation was the result of national developments rather than a global shock, and it emerged with different timing and force in each country.

In the United States, rapid monetary growth in 1985 and 1986 helped push inflation upward by 1987 and 1988. The Federal Reserve responded with tight monetary policy, which tilted the U.S. economy into an economic downturn by the summer of 1990. The U.S. economic rebound, starting in 1992, set the stage for a prolonged American expansion characterized by low inflation, a booming stock market, and low unemployment rates unmatched since before the first oil shock in the early 1970s.

The reunification of West and East Germany on July 1, 1990, following the collapse of the former Soviet Union’s empire in eastern Europe, set off inflationary pressures in Germany. At the same time, other European countries were pegging their exchange rates to Germany’s former currency, the deutsche mark (DM), within the European Union’s fixed exchange rate mechanism, the European Monetary System (EMS). Germany’s contractionary monetary response to its internal inflation pressures led to slower growth in its EMS partners, many of whom were not afflicted by rising inflation as Germany was. The resulting asymmetric pressures within the EMS led to a massive speculative attack on the EMS fixed parities, as we shall see in Chapter 20.

Japanese inflation rose in 1989, in part the result of a relatively loose monetary policy from 1986 to 1988. Two very visible symptoms of these pressures were skyrocketing prices for Japanese real estate and stocks. The Bank of Japan’s strategy of puncturing these asset price bubbles through restrictive monetary policy and high interest rates succeeded well, and Tokyo’s Nikkei stock price index lost more than half its value between 1990 and 1992. Unfortunately, the sharp fall in asset prices threw Japan’s banking system into crisis and the economy into recession by early 1992. A decade later, the banking crisis was still largely unresolved.

Japan’s growth picked up in 1996, but its government, worried by a growing public debt, raised taxes. The economy slowed in 1997, the deep and widespread problems of Japanese financial institutions became more apparent, and the yen fell sharply, dropping staggeringly from ¥80 per dollar early in 1995 to around ¥145 per dollar in the summer of 1998, before recovering somewhat later that year. By 1998, however, the Japanese economy seemed to be in free fall, with shrinking GDP, declining prices, and its highest unemployment level in more than four decades.

The problems of the Japanese economy spilled over to the developing countries in East Asia, with which it trades heavily. As we shall see in Chapter 22, many of these economies



had experienced spectacularly rapid rates of GDP growth for many years through 1997. Many of them also held their exchange rates fixed, or in target ranges, against the U.S. dollar. Japan's slowdown in 1997 therefore weakened the East Asian economies directly, but also did so through an exchange rate channel. Being tied to the dollar, East Asian currencies tended to appreciate against the yen as the yen slid against the dollar. The East Asian economies, feeling the direct effect of Japan's slower growth on the demand for their imports, simultaneously found their exports priced out of foreign markets.

The eventual result was a cascading series of speculative attacks on East Asian currencies, beginning with Thailand's baht in the spring of 1997 and moving on to Malaysia, Indonesia, and Korea. These economies fell into deep recessions, as we shall discuss in detail in Chapter 22, pulled down by Japan but also pulling Japan down in a vicious circle. Other economies in the region, including Singapore, Hong Kong, and China, also experienced slower growth in 1998, as did Latin America. Russia defaulted on its internal and external debts, setting off global investor jitters and domestic financial chaos. The fear of a worldwide depression prompted a series of interest rate cuts by the Federal Reserve late in 1998, as well as an unprecedented coordinated interest rate cut by the 11 European countries preparing to give up their national currencies in 1999 in favor of the euro.

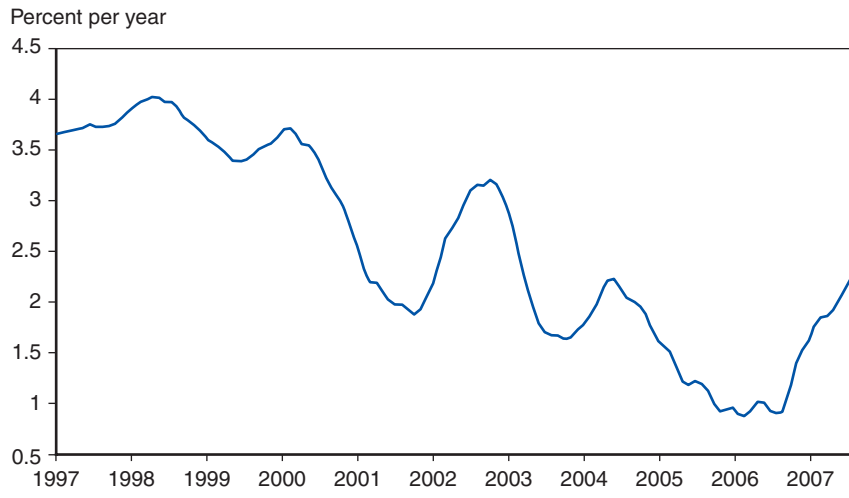
These measures helped to avert a global economic meltdown. By the end of 1999 the worst of the financial crisis seemed to be past. In the spring of 2001, however, the U.S. economy went into a mild recession as a ten-year spell of uninterrupted growth came to an end. The slowdown was intensified by the terrorist attacks on New York City and Washington, D.C., on September 11, 2001. Rapid interest rate cuts by the Federal Reserve, coupled with large tax cuts favored by President George W. Bush, made the U.S. recession a brief one.

The Bush tax cuts, however, led to large government deficits, just as President Reagan's had two decades earlier. Once again, the United States' current account deficit, already high in 2000 because of the high investment level then prevailing, swelled. Another factor reducing U.S. saving was a rapid increase in real estate prices. As Americans borrowed against their rising home equity values, the net U.S. household saving rate turned negative. As a result, the U.S. current account deficit reached an unprecedented 6.5 percent of GDP by the middle of the decade (see Figure 12-2), and the dollar began to depreciate, particularly against the euro (see Figure 19-3).

With uncertain growth prospects in Europe and Japan, the U.S. external imbalance posed a dilemma for American policy in the mid-2000s. Measures to reduce U.S. consumption and increase saving, such as a fiscal contraction, would slow down the world's major engine of economic growth. On the other hand, foreigners might not be willing to finance the U.S. current account deficit forever, particularly if they feared further dollar depreciation. Indeed, much of the financing of the U.S. deficit came from dollar purchases by developing-country central banks, especially that of China, which bought massive sums while pegging their currencies against the dollar (as we discuss further in Chapter 22). The United States thus found itself in a situation that, to many observers, appeared increasingly precarious.

The potential for instability seemed to be realized in the summer of 2007 when a crisis erupted, this time not in the developing world, but in the credit markets of the industrial world. The roots of the crisis lay in the United States home mortgage market. We will discuss the crisis, its global nature, and the policy responses in much greater detail in Chapter 21.

One key element leading to the crisis was a puzzling period of very low long-term real interest rates. Low interest rates sparked a run-up in home prices in the United



**Figure 19-4**

**U.S. Real Interest Rate, 1997–2007**

Real interest rates fell to low levels in the 2000s until late in 2005, when they began to rise sharply.

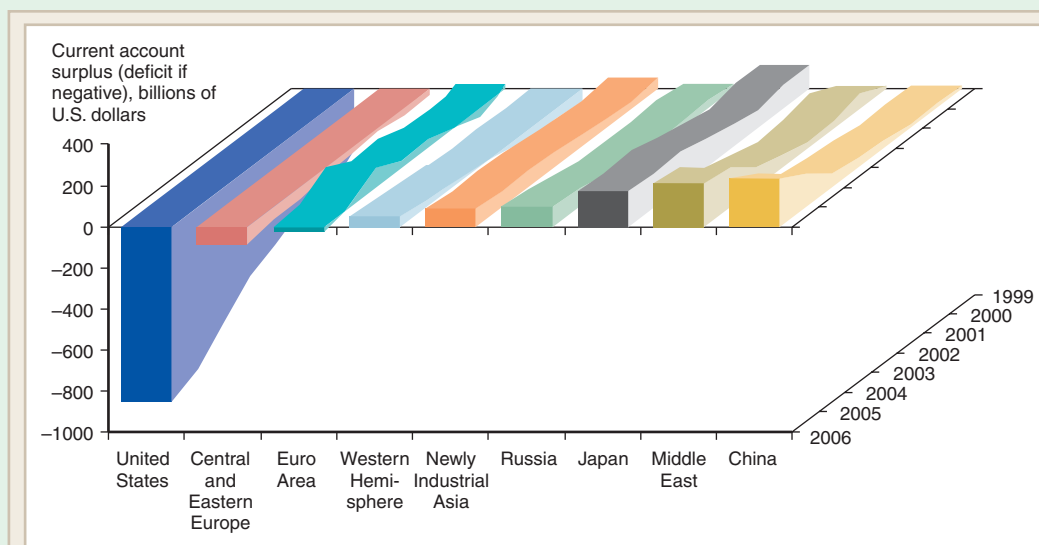
**Source:** Global Financial Data. Real interest rates are defined as ten-year government bond rates less average inflation over the preceding twelve months. The data are twelve-month moving averages of monthly real interest rates so defined.

States and in many other countries, and in the United States led to much riskier practices among mortgage lenders (for example, lending with minimal or zero down payments, or with temporarily low “teaser” interest rates). Figure 19-4 shows the behavior of the long-term U.S. real interest rate starting in 1997. As you can see, real interest rates were low from 2003 to the end of 2005, and then rose. This abrupt rise in interest rates left many who had borrowed to buy homes unable to meet their monthly mortgage payments. In their turn, the homeowners’ creditors ran into trouble, and the credit crisis of 2007 erupted. To understand the pattern of real interest rates during the 2000s and its effects, we must consider how the large U.S. current account deficit that developed in that decade fit together with the external imbalances of foreign countries—which, necessarily, add up to a surplus that equals the U.S. deficit.

**Global Imbalances and Real Interest Rates in the 2000s**

During the years after 1999, the pattern of global external imbalances widened. Figure 19-5 gives a picture of this process. It is useful to think of the negative entries in the figure (the deficit entries) as showing net demands for global savings, while the positive entries (the surplus entries) show net supplies of savings (saving in excess of domestic investment needs). In an equilibrium for the global financial markets, the worldwide demand for savings equals the worldwide supply, which is another way of saying that the current account balances of all countries must add up to zero.

On the demand side, the dramatic explosion of the U.S. current account deficit was the dominant development. Because the current account equals saving minus investment, a



**Figure 19-5**

**Global External Imbalances, 1999–2006**

During the 2000s, the large increase in the United States current account deficit was financed by increases in the surpluses of Asian countries (notably China), Latin America, and oil exporters.

**Source:** International Monetary Fund, *World Economic Outlook*, April 2007.

large U.S. deficit meant that American investment (in effect, a demand for savings) far exceeded the supply of savings generated by American households, firms, and governmental units. Also contributing to the global demand for savings, though on a much smaller scale, was the investment-driven demand coming from the rapidly developing countries of central and eastern Europe (see Figure 19-5). We have already described how the U.S. tax cut of the early 2000s helped to drive the U.S. current account deficit higher. The puzzling feature of the data is that, as the U.S. deficit widened—reflecting an *increase* in American demand for the world's savings—the real interest rate *fell*. Lower real interest rates helped drive American home prices higher, encouraging people to borrow against home equity and spend more out of national income. It would seem more natural, instead, for real interest rates to have *risen*, encouraging U.S. saving and discouraging U.S. investment. How could the opposite, a fall in worldwide real interest rates, have happened? The answer must lie in a change in saving and investment behavior outside of the United States.

Figure 19-5 shows that over the 2000s, current account surpluses rose in Russia, the Middle East, Asia (notably China, but also Japan and newly industrialized countries such as Singapore), and Latin America. The surplus of Africa (not shown in the figure) also increased. Economists still debate the causes of these surpluses, but a number of likely factors stand out. One of these was the emergence of the Chinese economy as a major player in the world economy. Growth in the private economy since the late 1970s led to very rapid economic expansion in China, but also to economic disruption for much of the country's huge population—for example, a reduction in social benefits such as health care, which state-owned firms had earlier supplied. As a precautionary measure, the Chinese saved more than they had in the past. At the same time, China's torrid economic growth (coupled with rather strong growth in the United States) increased the prices of a

range of primary commodities, notably petroleum. The revenues from exporting Brazilian soybeans and iron, Malaysian palm oil, and Russian, Venezuelan, Congolese, and Saudi petroleum all soared. These economic windfalls, running ahead of the recipients' abilities to spend or invest them, also helped to raise worldwide saving.

A second factor was at work in raising global saving outside the United States. The economic and financial crises of the late 1990s had made poorer countries more cautious in their fiscal policies, and also reduced their willingness to invest. Similarly, economic uncertainty in Japan depressed investment demand there. One result of more conservative economic policies in the developing world was the rapid accumulation of U.S. dollar reserves mentioned above, an outcome that provided these poorer countries with a welcome cushion against possible future economic misfortunes.

To summarize, the higher supply of savings from countries outside of the United States, coupled with generally lower investment demand, more than offset the effects on the global financial markets of the higher American current account deficit. The result was a fall in global interest rates.<sup>5</sup>

Such low real interest rates could not last forever. Eventually, commodity exporters' consumption began to catch up to their income, and world investment demand rose. When real interest rates began to rise after 2005, many of the subprime home loans made earlier in the 2000s by aggressive mortgage lenders began to look as if they would never be repaid. The lenders (including banks) then started to encounter serious difficulties in borrowing themselves. The Federal Reserve cut U.S. interest rates sharply to stave off a recession, sending the dollar down sharply in the foreign exchange market.

Many observers viewed the dollar depreciation as a major component in the eventual adjustment of the global current account imbalances to more sustainable levels, a complement to currency appreciation in China and the other surplus countries. As we will discuss in detail in Chapter 22, however, China's exchange rate remained tightly controlled by its government, which came under increasing international criticism for refusing to allow more rapid appreciation.

## What Has Been Learned Since 1973?

The first two sections of this chapter outlined the main elements of the cases for and against floating exchange rates. Having examined the events of the recent floating-rate period, we now compare experience with the predictions made before 1973 by the proponents and opponents of floating and ask whether recent history supports a definitive judgment about reforming the current exchange rate system.

### Monetary Policy Autonomy

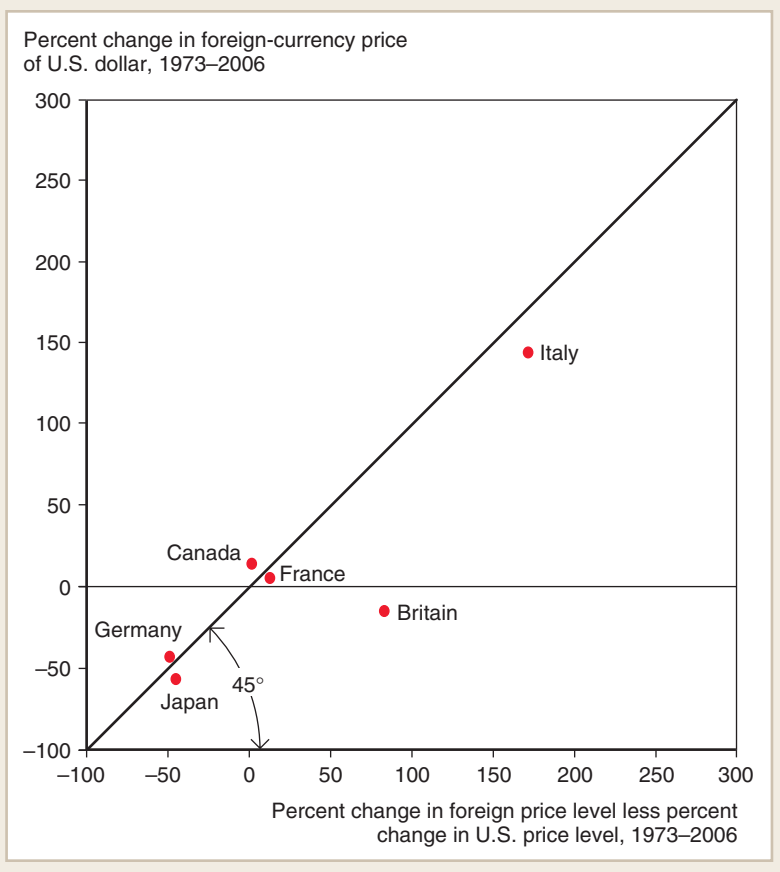
There is no question that floating gave central banks the ability to control their money supplies and to choose their preferred rates of trend inflation. As a result, floating exchange rates allowed a much larger international divergence in inflation. Did exchange depreciation

<sup>5</sup> Problem 11 at the end of this chapter suggests a simple economic framework that will help you think through the effects of shifts in the world's demand and supply curves for savings. The article by Ben Bernanke in Further Reading offers a detailed analysis of the low real interest rates of the mid-2000s.

**Figure 19-6****Exchange Rate Trends and Inflation Differentials, 1973–2006**

Over the floating-rate period as a whole, higher inflation has been associated with greater currency depreciation. The exact relationship predicted by relative PPP, however, has not held for most countries. The inflation difference on the horizontal axis is calculated as  $(\pi - \pi_{US}) \div (1 + \pi_{US}/100)$  using the exact relative PPP relation given in footnote 1 on p. 385.

**Source:** International Monetary Fund and Global Financial Data.



offset inflation differentials between countries over the floating-rate period? Figure 19-6 compares domestic currency depreciation against the dollar with the difference between domestic and U.S. inflation for the six largest industrial market economies outside the United States. The PPP theory predicts that the points in the figure should lie along the 45-degree line, indicating proportional exchange rate and relative price level changes, but this is not exactly the case. While Figure 19-6 therefore confirms the lesson of Chapter 15 that PPP has not always held closely, even over long periods of time, it does show that on balance, high-inflation countries have tended to have weaker currencies than their low-inflation neighbors. Furthermore, most of the difference in depreciation rates is due to inflation differences, making PPP a major factor behind long-run nominal exchange rate variability.

While the inflation insulation part of the policy autonomy argument is broadly supported as a *long-run* proposition, economic analysis and experience both show that in the short run, the effects of monetary as well as fiscal changes are transmitted across national borders under floating rates. The two-country macroeconomic model developed earlier, for example, shows that monetary policy affects output in the short run both at home and abroad as long as it alters the real exchange rate. The critics of floating were therefore right in claiming that floating rates would not insulate countries completely from foreign policy shocks.

Experience has also given dramatic support to the skeptics who argued that no central bank can be indifferent to its currency's value in the foreign exchange market. After 1973 central banks intervened repeatedly in the foreign exchange market to alter currency values, and even the Reagan administration's *laissez-faire* policy on exchange rates was abandoned

when the Plaza initiative of September 1985 was launched. (See the Case Study, p. 545.) The post-1973 floating of exchange rates is often characterized as a “dirty float” rather than a “clean float” because central banks intervened on a discretionary basis and continued to hold foreign exchange reserves (Chapter 17).

Why did central banks continue to intervene even in the absence of any formal obligation to do so? As we saw in the example of a change in domestic money demand, intervention to fix the exchange rate can stabilize output and the price level when certain disturbances occur, and central banks sometimes felt that exchange rate movements were due to such factors. But even in the presence of output market disturbances, central banks wanted to slow exchange rate movements to prevent sharp changes in the international competitiveness of their tradable goods sectors. Such changes, if reversed later, might generate excessive sectoral employment fluctuations, and they might also lead to pressures for protection. Finally, central banks worried that even temporary exchange rate shifts might have medium-term inflationary effects that would be hard to wring out of the economy.

Those skeptical of the autonomy argument had also predicted that while floating would allow central banks to control nominal money supplies, their ability to affect output would still be limited by the price level’s tendency to respond more quickly to monetary changes under a floating rate. This prediction was partially borne out by experience. Monetary changes clearly had a much greater short-run effect on the *real* exchange rate under a floating nominal exchange rate than under a fixed one, increasing the immediate influence of money on output in some countries. In many cases, however, this influence turned out to be short-lived. The quick response of the exchange rate to money supply changes affected import prices and wage settlements, shortening the time span over which money could alter real economic activity without changing nominal output prices. The link between exchange depreciation and inflation was illustrated by the U.S. experience of 1976–1979 and by the rapid inflation that resulted from attempts by Britain, France, and Italy, at various times, to spur output growth through monetary expansion. The U.S. disinflation after 1979 illustrated that a floating rate could also speed the translation of monetary contraction into lower inflation.

## Symmetry

Because central banks continued to hold dollar reserves and intervene, the international monetary system did not become symmetric after 1973. The euro and the yen gained importance as international reserve currencies (and the British pound declined), but the dollar remained the primary component of most central banks’ official reserves.

Economist Ronald McKinnon of Stanford University has argued that the current floating-rate system is similar in some ways to the asymmetric reserve currency system underlying the Bretton Woods arrangements.<sup>6</sup> He suggests that changes in the world money supply would have been dampened under a more symmetric monetary adjustment mechanism. Intervention outside the United States to slow the dollar’s rise after 1979, for example, led to monetary contraction abroad with no symmetric increase in the U.S. money supply. The resulting world monetary crunch was harsher because of this asymmetry, which therefore helped deepen the recession that followed.

## The Exchange Rate as an Automatic Stabilizer

The world economy has undergone major structural changes since 1973. Because these shifts changed relative national output prices (Figure 19-6), it is doubtful that any pattern of fixed exchange rates would have been viable without some significant parity changes.

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<sup>6</sup>Ronald I. McKinnon, *An International Standard for Monetary Stabilization*, Policy Analyses in International Economics 8 (Washington, D.C.: Institute for International Economics, 1984).

The industrial economies certainly wouldn't have weathered the two oil shocks as well as they did while defending fixed exchange rates. In the absence of capital controls, speculative attacks similar to those that brought down the Bretton Woods system would have occurred periodically, as recent experience has shown. Under floating, however, many countries were able to relax the capital controls put in place earlier. The progressive loosening of controls spurred the rapid growth of a global financial industry and allowed countries to realize greater gains from intertemporal trade and from trade in assets.

The effects of the U.S. fiscal expansion after 1981 illustrate the stabilizing properties of a floating exchange rate. As the dollar appreciated, U.S. inflation was slowed, American consumers enjoyed an improvement in their terms of trade, and economic recovery was spread abroad.

The dollar's appreciation after 1981 also illustrates a problem with the view that floating rates can cushion the economy from real disturbances such as shifts in aggregate demand. Even though *overall* output and the price level may be cushioned, some sectors of the economy may be hurt. For example, while the dollar's appreciation helped transmit U.S. fiscal expansion abroad in the 1980s, it worsened the plight of American agriculture, which did not benefit directly from the higher government demand. Real exchange rate changes can do damage by causing excessive adjustment problems in some sectors and by generating calls for increased protection.

Permanent changes in goods market conditions require eventual adjustment in real exchange rates that can be speeded by a floating-rate system. Foreign exchange intervention to peg nominal exchange rates cannot prevent this eventual adjustment because money is neutral in the long run and thus is powerless to alter relative prices permanently. The events of the 1980s show, however, that if it is costly for factors of production to move between sectors of the economy, there is a case for pegging rates in the face of temporary output market shocks. Unfortunately, this lesson leaves policy makers with the difficult task of determining which disturbances are temporary and which are permanent.

An indictment of floating exchange rates is sometimes based on the poor economic growth record of industrial countries in the 1970s compared with the 1950s and 1960s. As noted above, unemployment rates in industrial countries rose sharply after the 1960s; in addition, labor productivity and real GNP growth rates dropped. These adverse developments followed the adoption of floating dollar exchange rates, but this coincidence does not prove that floating rates were their cause. The 1970s were a turbulent transitional decade. Economic performance has subsequently been quite varied across the major industrial regions (see Table 19-1), although all have had floating currencies. Economists have not yet fully explained the 1970s growth slowdown or the rise in unemployment rates, but the likely culprits are structural changes that had little to do with floating rates. Examples include the oil price shocks, restrictive labor market practices, and worker displacement caused by the emergence of several developing countries as major exporters of manufactured goods.

## Discipline

Did countries abuse the autonomy afforded by floating rates? Inflation rates did accelerate after 1973 and remained high through the second oil shock. But the concerted disinflation in industrial countries after 1979 proved that central banks could resist the temptations of inflation under floating rates. On several occasions, voters in industrial countries showed that they viewed a weak currency as a sign of economic mismanagement. For this reason, currency depreciation sometimes brought sharp changes in monetary policies, as in the United States in 1979.

The system placed fewer obvious restraints on unbalanced fiscal policies, for example, the high U.S. government budget deficits of the 1980s and 2000s. While some observers felt that

fixed rates would have forced a more moderate American fiscal stance, their arguments were not compelling. In the late 1960s, fixed rates had failed to restrain the Johnson administration's fiscal expansion, a policy move that contributed to the collapse of the Bretton Woods system.

### Destabilizing Speculation

Floating exchange rates have exhibited much more day-to-day volatility than the early advocates of floating would have predicted, but as we saw in Chapter 13, exchange rates are asset prices, so considerable volatility is to be expected. The asset price nature of exchange rates was not well understood by economists before the 1970s.

Even with the benefit of hindsight, however, short-term exchange rate movements can be quite difficult to relate to actual news about economic events that affect currency values. Part of the difficulty is that government officials often try to influence exchange rates by hinting at intended policy changes, thus making expectations about future macroeconomic policies volatile. The question of whether exchange rate volatility has been "excessive" relative to the theoretical determinants of exchange rates is a controversial one and provides an active research area for academic economists (Chapter 21).

Over the longer term, however, exchange rates have roughly reflected changes in monetary and fiscal policies, and their broad movements do not appear to be the result of destabilizing speculation. The decline of the dollar in the late 1970s (see Figure 19-3) coincides with loose U.S. monetary policies, while its steep ascent between 1980 and 1985 occurred as the United States embarked on disinflation and a fiscal expansion of a size unprecedented in peacetime. While most economists agree that the direction of these exchange rate swings was appropriate, there is continuing debate about their magnitude. Some feel the foreign exchange market overreacted to government actions and that more systematic foreign exchange intervention would have been beneficial.

The experience with floating rates has not supported the idea that arbitrary exchange rate movements can lead to "vicious circles" of inflation and depreciation. Britain, Italy, and, to a lesser extent, France experienced inflationary spirals similar to those predicted by the vicious circle theory. But the currency depreciation that accompanied these spirals was not the arbitrary result of destabilizing exchange rate speculation. Industrial countries with poor inflation performances under floating exchange rates have also tended to have relatively rapid rates of monetary growth.

### International Trade and Investment

Critics of floating had predicted that international trade and investment would suffer as a result of increased uncertainty. The prediction was certainly wrong with regard to investment, for international financial intermediation expanded strongly after 1973 as countries lowered barriers to capital movement (see Chapter 21).

There is controversy about the effects of floating rates on international trade. The use of forward markets and other derivatives expanded dramatically, just as advocates of floating had foreseen, and innovative financial instruments were developed to help traders avoid exchange rate risk. But some economists contend that the costs of avoiding exchange rate risk have had an effect similar to increased international transport costs in reducing the available gains from trade. They argue that as a result of these costs, international trade has grown more slowly than it would have under a hypothetical fixed exchange rate regime.

A very crude but direct measure of the extent of a country's international trade is the average of its imports and exports of goods and services, divided by its output. For most countries, the extent of trade shows a rising trend over the whole postwar period, with no marked slowdown after the move to floating. Furthermore, to compare world trade growth



before and after the early 1970s is to stack the deck against floating rates, because while the 1950s and 1960s were periods of dramatic trade liberalization, the 1970s and 1980s were marked by a surge in nontariff barriers to trade.<sup>7</sup>

Evaluation of the effects of floating rates on world trade is complicated further by the activities of multinational firms, many of which vastly expanded their international production operations in the years after 1973. Facing a more turbulent economic environment, multinationals may have spread their activities over more countries in the hope of reducing their dependence on any individual government's economic policies. Because trade and capital movements can substitute for each other, however, the displacement of some trade by multinational firms' overseas production does not necessarily imply that welfare-improving trade gains have been lost.<sup>8</sup>

International trade has recently been threatened by the resurgence of protectionism, a symptom of slower economic growth and wide swings in real exchange rates, which have been labeled *misalignments*. (The dollar's misalignment of the mid-1980s, prominently visible in Figure 19-3, is a leading example.) It is possible, however, that similar pressures to limit trade would have emerged under fixed exchange rates. Misalignments have had an especially severe impact on those who lose jobs as a result and have few other financial resources.

### Policy Coordination

Floating exchange rates themselves have not promoted international policy coordination. On several occasions, for example, during the disinflation of the early 1980s, industrial countries as a group could have attained their macroeconomic goals more effectively by negotiating a joint approach to common objectives. The appendix to this chapter presents a formal model that illustrates how all countries can gain through international policy coordination.

While beggar-thy-neighbor policies sometimes have been a problem, critics of floating have not made a strong case that the problem would disappear under an alternative currency regime. Under fixed rates, for example, countries can always devalue their currencies unilaterally to attain nationalistic goals.

Governments, like people, often are motivated by their own interest rather than that of the community. Legal penalties discourage antisocial actions by individuals, but it is a more difficult matter to design sanctions that bind sovereign governments. It seems doubtful that an exchange rate system alone can restrain a government from following its own perceived interest when it formulates macroeconomic policies.

## Are Fixed Exchange Rates Even an Option for Most Countries?

The post-Bretton Woods experience suggests another hypothesis: Durable fixed exchange rate arrangements may not even be *possible*. In a financially integrated world in which funds can move instantly between national financial markets, fixed exchange rates cannot

<sup>7</sup>There is a large econometric literature that studies how exchange rate volatility affects trade growth, and some authors reach conclusions different from those in the preceding paragraph. Unfortunately, various researchers differ in terms of their measures of trade volume, definitions of exchange rate volatility, and choices of estimation period, so it is difficult to draw unambiguous conclusions from this body of work. We will return to this topic in the next chapter.

<sup>8</sup>A study documenting the growth of U.S. multinationals' foreign exporting activities is Robert E. Lipsey and Irving B. Kravis, "The Competitiveness and Comparative Advantage of U.S. Multinationals, 1957–1984," *Banca Nazionale del Lavoro Quarterly Review* (June 1987), pp. 147–165.

be credibly maintained over the long run unless countries are willing to maintain controls over capital movements (as China does), or, at the other extreme, move to a shared single currency with their monetary partners (as in Europe). Short of these measures, the argument goes, attempts to fix exchange rates will necessarily lack credibility and be relatively short-lived. Under such conditions, fixed rates will not deliver the benefits promised by their proponents.<sup>9</sup>

This pessimistic view of fixed exchange rates is based on the theory that speculative currency crises can, at least in part, be self-fulfilling events (recall Chapter 17). According to that view, even a country following prudent monetary and fiscal policies is not safe from speculative attacks on its fixed exchange rate. Once the country encounters an economic reversal, as it eventually must, currency speculators will pounce, forcing domestic interest rates sky-high and inflicting enough economic pain that the government will choose to abandon its exchange rate target.

At the turn of the 21st century, speculative attacks on fixed exchange rate arrangements—in Europe, East Asia, and elsewhere—were occurring with seemingly increasing frequency. The number and circumstances of those crises lent increasing plausibility to the argument that it is impossible to peg currency values for long while maintaining open capital markets and national policy sovereignty.

## Directions for Reform

The experience with floating exchange rates since 1973 shows that neither side in the debate over floating was entirely right in its predictions. The floating-rate system has not been free of problems, but neither has it been the fiasco its opponents predicted it would be.

An important lesson of this chapter and the previous one is that no exchange rate system works well when countries “go it alone” and follow narrowly perceived self-interest. The Bretton Woods system functioned reasonably well until the United States unilaterally adopted overexpansionary policies under President Lyndon B. Johnson. Similarly, the worst problems of the floating-rate system occurred when countries failed to take coordinated action on common macroeconomic problems. Globally balanced and stable policies are a prerequisite for the successful performance of any international monetary system.

Current proposals to reform the international monetary system run the gamut from a more elaborate system of target zones for the dollar to the resurrection of fixed rates to the introduction of a single world currency. Because countries seem unwilling to give up the autonomy floating dollar rates have given them, it is unlikely that any of these changes is in the cards.<sup>10</sup>

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<sup>9</sup>For an early statement of the hypothesis that fixed exchange rates combined with mobile capital can be unstable, see Maurice Obstfeld, “Floating Exchange Rates: Experience and Prospects,” *Brookings Papers on Economic Activity* 2 (1985), pp. 369–450. For more recent discussions see Barry Eichengreen, *International Monetary Arrangements for the 21st Century* (Washington, D.C.: Brookings Institution, 1994); Lars E. O. Svensson, “Fixed Exchange Rates as a Means to Price Stability: What Have We Learned?” *European Economic Review* 38 (May 1994), pp. 447–468; and Maurice Obstfeld and Kenneth Rogoff, “The Mirage of Fixed Exchange Rates,” *Journal of Economic Perspectives* 9 (Fall 1995), pp. 73–96.

<sup>10</sup>An extended target zone proposal is outlined in John Williamson and Marcus H. Miller, *Targets and Indicators: A Blueprint for the International Coordination of Macroeconomic Policies*, Policy Analyses in International Economics 22 (Washington, D.C.: Institute for International Economics, 1987). McKinnon, *op. cit.*, presents a program for reestablishing fixed rates for the currencies of the main industrial country groups. The case for a single currency for the industrialized democracies is made by Richard N. Cooper, “A Monetary System for the Future,” *Foreign Affairs* 63 (1984), pp. 166–184.

With greater policy cooperation among the main players, there is no reason why floating exchange rates should not function tolerably well in the future. International policy cooperation is not unprecedented, as the GATT rounds of tariff reduction and the founding of the IMF, World Bank, and WTO indicate. Events of the past few years suggest, however, that cooperation should be sought as an end in itself and not as the indirect result of exchange rate agreements that eventually are discredited through repeated amendment or violation.

## SUMMARY

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1. The weaknesses of the Bretton Woods system led many economists to advocate floating exchange rates before 1973. They made three main arguments in favor of floating. First, they argued that floating rates would give national macroeconomic policy makers greater autonomy in managing their economies. Second, they predicted that floating rates would remove the asymmetries of the Bretton Woods arrangements. Third, they pointed out that floating exchange rates would quickly eliminate the “fundamental disequilibriums” that had led to parity changes and speculative attacks under fixed rates.
2. Critics of floating rates advanced several counterarguments. Some feared that floating would encourage monetary and fiscal excesses and beggar-thy-neighbor policies. Other lines of criticism asserted that floating rates would be subject to *destabilizing speculation* and that uncertainty over exchange rates would retard international trade and investment. Finally, a number of economists questioned whether countries would be willing in practice to disregard the exchange rate in formulating their monetary and fiscal policies. The exchange rate, they predicted, was an important enough price that it would become a target of macroeconomic policy in its own right.
3. Between 1973 and 1980 floating rates seemed on the whole to function well. In particular, it is unlikely that the industrial countries could have maintained fixed exchange rates in the face of the *stagflation* caused by two oil shocks. The dollar suffered a sharp depreciation after 1976, however, as the United States adopted macroeconomic policies more expansionary than those of other industrial countries.
4. A sharp turn toward slower monetary growth in the United States, coupled with a rising U.S. government budget deficit, contributed to massive dollar appreciation between 1980 and early 1985. Other industrial economies pursued disinflation along with the United States, and the resulting worldwide monetary slowdown, coming soon after the second oil shock, led to the deepest recession since the 1930s. As the recovery from the recession slowed in late 1984 and the U.S. current account began to register record deficits, political pressure for wide-ranging trade restrictions gathered momentum in Washington. The drive for protection was slowed (but not defeated) by the September 1985 decision of the United States and four other major industrial countries to take concerted action to bring down the dollar. Exchange rate stability was downplayed as a prime policy goal in the 1990s and 2000s. Instead, governments aimed to target low domestic inflation while maintaining economic growth. After 2000, global external imbalances widened dramatically.
5. The experience of floating does not fully support either the early advocates of that exchange rate system or its critics. One unambiguous lesson of experience, however, is that no exchange rate system functions well when international economic cooperation breaks down. Severe limits on exchange rate flexibility among the major currencies are unlikely to be reinstated in the near future. But increased consultation among international policy makers should improve the performance of floating rates.

## KEY TERMS

- destabilizing speculation, p. 538  
 nominal and real effective exchange  
 rate indexes, p. 543
- stagflation, p. 541

## PROBLEMS



1. Use the *DD-AA* model to examine the effects of a one-time rise in the foreign price level,  $P^*$ . If the expected future exchange rate  $E^e$  falls immediately in proportion to  $P^*$  (in line with PPP), show that the exchange rate will also appreciate immediately in proportion to the rise in  $P^*$ . If the economy is initially in internal and external balance, will its position be disturbed by such a rise in  $P^*$ ?
2. Analyze a transitory increase in the foreign interest rate,  $R^*$ . Under which type of exchange rate is there a smaller effect on output—fixed or floating?
3. Suppose now that  $R^*$  rises permanently. What happens to the economy, and how does your answer depend on whether the change reflects a rise in the foreign real interest rate or in foreign inflation expectations (the Fisher effect)?
4. If the foreign *inflation rate* rises permanently, would you expect a floating exchange rate to insulate the domestic economy in the short run? What would happen in the long run? In answering the latter question, pay attention to the long-run relationship between domestic and foreign nominal interest rates.
5. Imagine that domestic and foreign currency bonds are imperfect substitutes and that investors suddenly shift their demand toward foreign currency bonds, raising the risk premium on domestic assets (Chapter 17). Which exchange rate regime minimizes the effect on output—fixed or floating?
6. How would you analyze the use of monetary and fiscal policy to maintain internal and external balance under a floating exchange rate?
7. The chapter described how the United States tried after 1985 to reduce its current account deficit by accelerating monetary growth and depreciating the dollar. Assume that the United States was in internal balance but external balance called for an expenditure-reducing policy (a cut in the government budget deficit) as well as the expenditure switching caused by currency depreciation. How would you expect the use of monetary expansion alone to affect the U.S. economy in the short and long runs?
8. After 1985 the United States asked Germany and Japan to adopt fiscal and monetary expansion as ways of increasing foreign demand for U.S. output and reducing the American current account deficit. Would fiscal expansion by Germany and Japan have accomplished these goals? What about monetary expansion? Would your answer change if you thought different German and Japanese policies might facilitate different U.S. policies?
9. What data might allow you to tell whether a large portion of Japan's recent foreign exchange intervention was sterilized? Try to find the relevant data for Japan in the IMF's *International Financial Statistics*.
10. Suppose the U.S. and Japanese governments both want to depreciate their currencies to help their tradables industries but fear the resulting inflation. The two policy choices available to each of them are (1) expansionary monetary policy and (2) no change in monetary policy. Develop an analysis like the one in the appendix to show the consequences

of different policy choices. Can Japan and the United States do better by cooperating than by acting individually?

11. The second Case Study (pp. 545) discussed the big global imbalances of the 2000s and suggested and that one can analyze factors determining world real interest rates in terms of the balance between the world demand for savings (in order to finance investment) and the world supply of savings (just as in a closed economy—which the world is). As a first step in formalizing such an analysis, assume there are no international differences in real interest rates due to expected real exchange rate changes. (For example, you might suppose that yours is a long-run analysis in which real exchange rates are expected to remain at their long-run levels.) As a second step, assume that a higher real interest rate reduces desired investment and raises desired saving throughout the world. Can you then devise a simple supply-demand picture of equilibrium in the world capital market in which quantities (saved or invested) are on the horizontal axis and the real interest rate is on the vertical axis? In such a setting, how would an increase in world saving, defined in the usual way as an outward shift in the entire supply-of-savings schedule, affect equilibrium saving, investment, and the real interest rate? Relate your discussion to the second Case Study in the chapter and to the paper by Ben S. Bernanke in Further Reading. [For a classic exposition of a similar model, see Lloyd A. Metzler, “The Process of International Adjustment under Conditions of Full Employment: A Keynesian View,” in *Readings in International Economics*, eds. Richard E. Caves and Harry G. Johnson (Homewood, IL: Richard D. Irwin, Inc. for the American Economic Association, 1968), pp. 465–486.]
12. The chapter suggested that because large increases in oil prices transfer income to countries that cannot rapidly increase their consumption or investment and therefore must save their windfalls, world real interest rates fall in the short run. Put together data on the U.S. real interest rate for 1970–1976, a period that includes the first OPEC oil shock. How does the U.S. real interest rate behave?
13. Look again at the shift in money demand in Figure 19-2, and imagine that the exchange rate is held fixed, so that the money supply automatically expands. How would this affect lending by domestic banks? If home firms are dependent on lending from domestic (as opposed to foreign) banks, and their investment rises when domestic bank lending expands, might the shift in the AA schedule affect domestic output?
14. We noted in this chapter that foreign central banks, especially in Asia, accumulated large dollar foreign reserves after 2000. One persistent worry was that those central banks, fearing dollar depreciation, would shift their reserve holdings from dollars to euros. Show that this action would be equivalent to a huge sterilized sale of dollars in the foreign exchange market. What might be the effects? Be sure to spell out your assumption about perfect versus imperfect asset substitutability.

## FURTHER READING

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- Ben S. Bernanke. “The Global Saving Glut and the U.S. Current Account Deficit.” Sandridge Lecture, March 10, 2005, at [www.federalreserve.gov/boarddocs/speeches/2005/20050310/default.htm](http://www.federalreserve.gov/boarddocs/speeches/2005/20050310/default.htm). The Federal Reserve chairman’s diagnosis of the low real interest rates of mid-2000s.
- Ralph C. Bryant. *International Coordination of National Stabilization Policies*. Washington, D.C.: Brookings Institution, 1995. Examines the interaction among national economic policies and the scope for international coordination.

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- Milton Friedman. “The Case for Flexible Exchange Rates,” in *Essays in Positive Economics*. Chicago: University of Chicago Press, 1953, pp. 157–203. A classic exposition of the merits of floating exchange rates.
- Morris Goldstein. *The Exchange Rate System and the IMF: A Modest Agenda*. Policy Analyses in International Economics 39. Washington, D.C.: Institute for International Economics, 1995. An analysis of the roles of international coordination and the IMF in the present exchange rate system.
- Harry G. Johnson. “The Case for Flexible Exchange Rates, 1969.” *Federal Reserve Bank of St. Louis Review* 51 (June 1969), pp. 12–24. An influential statement of the case for replacing the Bretton Woods system by floating rates.
- Charles P. Kindleberger, “The Case for Fixed Exchange Rates, 1969,” in *The International Adjustment Mechanism*, Conference Series 2. Boston: Federal Reserve Bank of Boston, 1970, pp. 93–108. Prescient analysis of problems with a floating-rate system.
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- Robert Solomon. *The International Monetary System, 1945–1981*. New York: Harper & Row, 1982. Chapters 15–19 cover the early years of floating exchange rates.
- Robert Solomon. *Money on the Move: The Revolution in International Finance Since 1980*. Princeton, NJ: Princeton University Press, 1999. Wide-ranging review of international financial developments after 1980.
- John Williamson. *The Exchange Rate System*, 2nd edition. Policy Analyses in International Economics 5. Washington, D.C.: Institute for International Economics, 1985. An indictment of floating exchange rates and a case for target zones.



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## International Policy Coordination Failures

This appendix illustrates the importance of macroeconomic policy coordination by showing how all countries can suffer as a result of self-centered policy decisions. The phenomenon is another example of the Prisoner's Dilemma of game theory (Chapter 9). Governments can achieve macroeconomic outcomes that are better for all if they choose policies cooperatively.

These points are made using an example based on the disinflation of the early 1980s. Recall that contractionary monetary policies in the industrial countries helped throw the world economy into a deep recession in 1981. Countries hoped to reduce inflation by slowing monetary growth, but the situation was complicated by the influence of exchange rates on the price level. A government that adopts a less restrictive monetary policy than its neighbors is likely to face a currency depreciation that partially frustrates its attempts to disinflate.

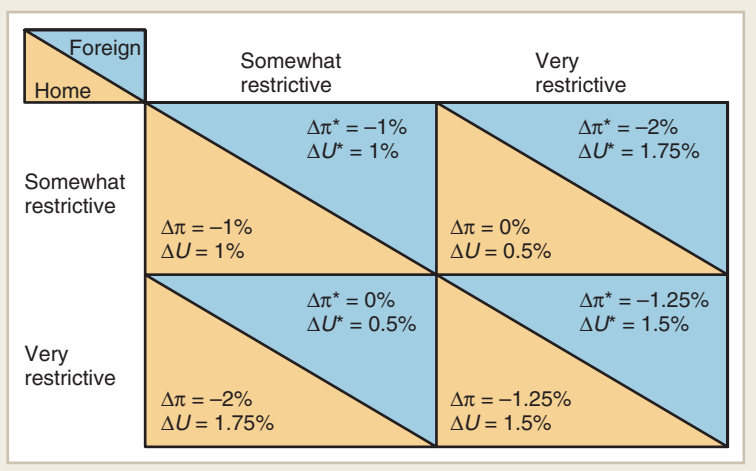
Many observers feel that in their individual attempts to resist currency depreciation, the industrial countries as a group adopted overly tight monetary policies that deepened the recession. All governments would have been happier if everyone had adopted looser monetary policies, but given the policies that other governments did adopt, it was not in the interest of any individual government to change course.

The argument above can be made more precise with a simple model. There are two countries, Home and Foreign, and each country has two policy options, a very restrictive monetary policy and a somewhat restrictive monetary policy. Figure 19A-1, which is similar to a diagram we used to analyze trade policies, shows the results in Home and Foreign of different policy choices by the two countries. Each row corresponds to a particular monetary policy decision by Home and each column to a decision by Foreign. The boxes contain entries giving changes in Home and Foreign annual inflation rates ( $\Delta\pi$  and  $\Delta\pi^*$ ) and unemployment rates ( $\Delta U$  and  $\Delta U^*$ ). Within each box, lower-left entries are Home outcomes and upper-right entries are Foreign outcomes.

**Figure 19A-1**

**Hypothetical Effects of Different Monetary Policy Combinations on Inflation and Unemployment**

Monetary policy choices in one country affect the outcomes of monetary policy choices made abroad.



**Figure 19A-2**

**Payoff Matrix for Different Monetary Policy Moves**

Each entry equals the reduction in inflation per unit rise in the unemployment rate (calculated as  $-\Delta\pi/\Delta U$ ). If each country “goes it alone,” they both choose very restrictive policies. Somewhat restrictive policies, if adopted by both countries, lead to an outcome better for both.

		Foreign	
		Somewhat restrictive	Very restrictive
Home	Somewhat restrictive	1	$\frac{8}{7}$
	Very restrictive	0	$\frac{5}{6}$

The hypothetical entries in Figure 19A-1 can be understood in terms of this chapter’s two-country model. Under somewhat restrictive policies, for example, inflation rates fall by 1 percent and unemployment rates rise by 1 percent in both countries. If Home suddenly shifts to a very restrictive policy while Foreign stands pat, Home’s currency appreciates, its inflation drops further, and its unemployment rises. Home’s additional monetary contraction, however, has two effects on Foreign. Foreign’s unemployment rate falls, but because Home’s currency appreciation is a currency *depreciation* for Foreign, Foreign inflation goes back up to its pre-disinflation level. In Foreign, the deflationary effects of higher unemployment are offset by the inflationary impact of a depreciating currency on import prices and wage demands. Home’s sharper monetary crunch therefore has a beggar-thy-neighbor effect on Foreign, which is forced to “import” some inflation from Home.

To translate the outcomes in Figure 19A-1 into policy payoffs, we assume each government wishes to get the biggest reduction in inflation at the lowest cost in terms of unemployment. That is, each government wishes to maximize  $-\Delta\pi/\Delta U$ , the inflation reduction per point of increased unemployment. The numbers in Figure 19A-1 lead to the payoff matrix shown as Figure 19A-2.

How do Home and Foreign behave faced with the payoffs in this matrix? Assume each government “goes it alone” and picks the policy that maximizes its own payoff given the other player’s policy choice. If Foreign adopts a somewhat restrictive policy, Home does better with a very restrictive policy (payoff =  $\frac{8}{7}$ ) than with a somewhat restrictive one (payoff = 1). If Foreign is very restrictive, Home still does better by being very restrictive (payoff =  $\frac{5}{6}$ ) than by being somewhat restrictive (payoff = 0). So no matter what Foreign does, Home’s government will always choose a very restrictive monetary policy.

Foreign finds itself in a symmetric position. It, too, is better off with a very restrictive policy regardless of what Home does. The result is that both countries will choose very restrictive monetary policies, and each will get a payoff of  $\frac{5}{6}$ .

Notice, however, that *both* countries are actually better off if they simultaneously adopt the somewhat restrictive policies. The resulting payoff for each is 1, which is greater than  $\frac{5}{6}$ . Under this last policy configuration, inflation falls less in the two countries, but the rise in unemployment is far less than under very restrictive policies.

Since both countries are better off with somewhat restrictive policies, why aren’t these adopted? The answer is at the root of the problem of policy coordination. Our analysis



assumed that each country “goes it alone” by maximizing its own payoff. Under this assumption, a situation where both countries were somewhat restrictive would not be stable: Each country would want to reduce its monetary growth further and use its exchange rate to hasten disinflation at its neighbor’s expense.

For the superior outcome in the upper-left corner of the matrix to occur, Home and Foreign must reach an explicit agreement, that is, they must *coordinate* their policy choices. Both countries must agree to forgo the beggar-thy-neighbor gains offered by very restrictive policies, and each country must abide by this agreement in spite of the incentive to cheat. If Home and Foreign can cooperate, both end up with a preferred mix of inflation and unemployment.

The reality of policy coordination is more complex than in this simple example because the choices and outcomes are more numerous and more uncertain. These added complexities make policy makers less willing to commit themselves to cooperative agreements and less certain that their counterparts abroad will live up to the agreed terms.