CHAPTER 20

Optimum Currency Areas and the European Experience

On January 1, 1999, 11 member countries of the European Union (EU) adopted a common currency, the euro. They have since been joined by six more EU members. Europe's bold experiment in economic and monetary union (EMU), which many had viewed as a visionary fantasy only a few years earlier, created a currency area with more than 300 million consumers—roughly 10 percent more populous than the United States. If the countries of Eastern Europe all eventually enter the euro zone, it will comprise more than 25 countries and stretch from the Arctic Ocean in the north to the Mediterranean Sea in the south, and from the Atlantic Ocean in the west to the Black Sea in the east. Figure 20-1 shows the extent of the euro zone as of 2011.

The birth of the euro resulted in fixed exchange rates between all EMU member countries. In deciding to form a monetary union, however, EMU countries sacrificed even more sovereignty over their monetary policies than a fixed exchange rate regime normally requires. They agreed to give up national currencies entirely and to hand over control of their monetary policies to a shared European System of Central Banks (ESCB). The euro project thus represents an extreme solution to the trilemma: absolute exchange rate stability, absolute openness to financial trade, but no monetary autonomy whatsoever.

The European experience raises a host of important questions. How and why did Europe set up its single currency? Has the euro been good for the economies of its members? How does the euro affect countries outside of EMU, notably the United States? And what lessons does the European experience carry for other potential currency blocs, such as the Mercosur trading group in South America?

This chapter focuses on Europe's experience of monetary unification to illustrate the economic benefits and costs of fixed exchange rate agreements and more comprehensive currency unification schemes. As we see in Europe's experience, the effects of joining a fixed exchange rate agreement are complex and depend crucially on microeconomic *and* macroeconomic factors. Our discussion of Europe will throw light not only on the forces promoting greater unification of national economies but also on the forces that make a country think twice before giving up completely its control over monetary policy.

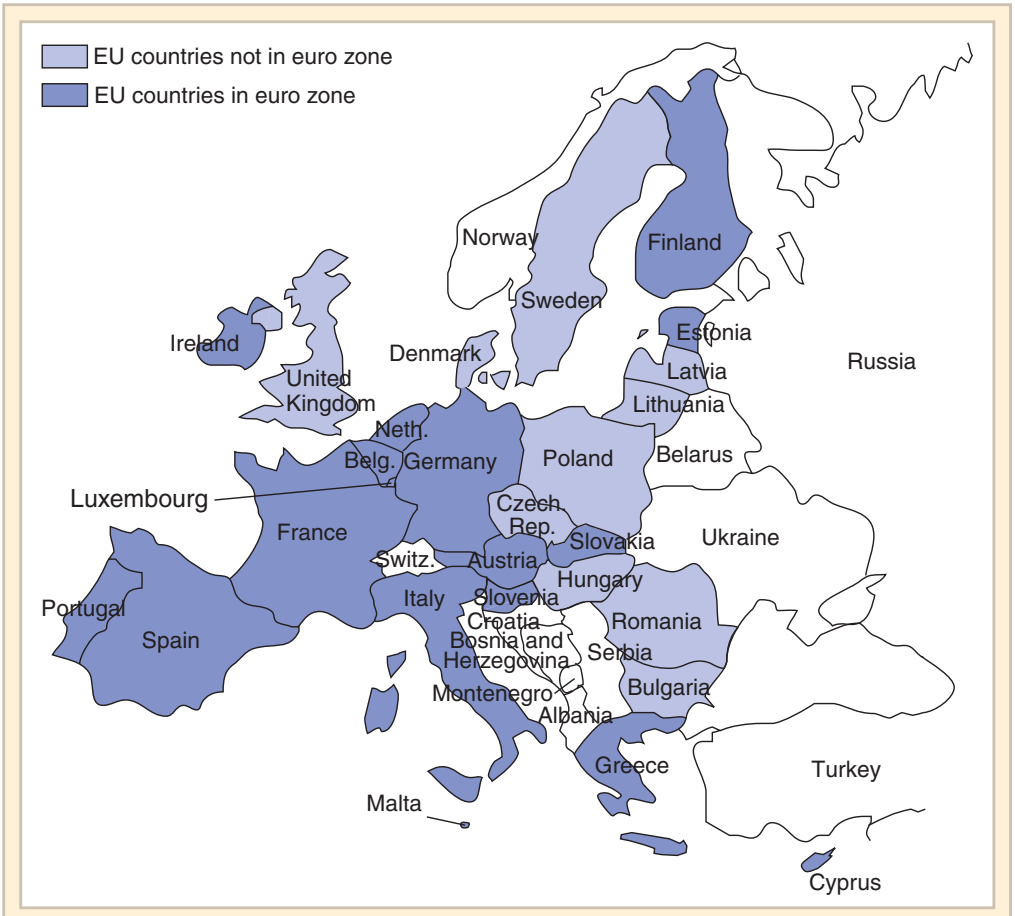


Figure 20-1

Members of the Euro Zone as of January 1, 2011

The heavily shaded countries on the map are the 17 members of EMU. They are: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, the Slovak Republic, Slovenia, and Spain.

LEARNING GOALS

After reading this chapter, you will be able to:

- Discuss why Europeans have long sought to stabilize their mutual exchange rates while floating against the U.S. dollar.
- Describe how the European Union, through the Maastricht Treaty of 1991, placed itself on the road to having a single currency, the euro, issued and managed by a European System of Central Banks (ESCB).
- Detail the structure of the ESCB and the European Union's restrictions on member states' fiscal policies.
- Articulate the main lessons of the theory of optimum currency areas.
- Recount how the 17 countries using the euro have fared so far in their currency union.

TABLE 20-1	A Brief Glossary of Euronyms
ECB	European Central Bank
EFSF	European Financial Stability Facility
EMS	European Monetary System
EMU	Economic and Monetary Union
ERM	Exchange Rate Mechanism
ESCB	European System of Central Banks
EU	European Union
SGP	Stability and Growth Pact

How the European Single Currency Evolved

Until its demise in 1973, the Bretton Woods system fixed every member country's exchange rate against the U.S. dollar and as a result also fixed the exchange rate between every pair of nondollar currencies. EU countries allowed their currencies to float against the dollar after 1973, but have tried progressively to narrow the extent to which they let their currencies fluctuate against each other. These efforts culminated in the birth of the euro on January 1, 1999.

What Has Driven European Monetary Cooperation?

What prompted the EU countries to seek closer coordination of monetary policies and greater mutual exchange rate stability? Two main motives inspired these moves and have remained major reasons for the adoption of the euro:

1. *To enhance Europe's role in the world monetary system.* The events leading up to the collapse of the Bretton Woods system were accompanied by declining European confidence in the readiness of the United States to place its international monetary responsibilities ahead of its national interests (Chapter 19). By speaking with a single voice on monetary issues, EU countries hoped to defend more effectively their own economic interests in the face of an increasingly self-absorbed United States.
2. *To turn the European Union into a truly unified market.* Even though the 1957 Treaty of Rome founding the EU had established a customs union, significant official barriers to the movements of goods and factors within Europe remained. A consistent goal of EU members has been to eliminate all such barriers and transform the EU into a huge unified market on the model of the United States. European officials believed, however, that exchange rate uncertainty, like official trade barriers, was a major factor reducing trade within Europe. They also feared that exchange rate swings causing large changes in intra-European relative prices would strengthen political forces hostile to free trade within Europe.[1]

[1] A very important administrative reason Europeans have sought to avoid big movements in European cross-exchange rates is related to the Common Agricultural Policy (CAP), the EU's system of agricultural price supports. Prior to the euro, agricultural prices were quoted in terms of the European Currency Unit (ECU), a basket of EU currencies. Exchange rate realignments within Europe would abruptly alter the real domestic value of the supported prices, provoking protests from farmers in the revaluing countries. The book by Giavazzi and Giovannini in Further Readings describes the contorted policies the EU used to minimize such internal redistributions after realignments. While the annoyance of administering the CAP under exchange rate realignments was undoubtedly crucial in starting Europeans on the road to currency unification, the two motives cited in the text are more important in explaining how Europe ultimately came to embrace a common currency.

The key to understanding how Europe has come so far in both market and monetary unification lies in the continent's war-torn history. After the end of World War II in 1945, many European leaders agreed that economic cooperation and integration among the former belligerents would be the best guarantee against a repetition of the 20th century's two devastating wars. The result was a gradual ceding of national economic policy powers to centralized European Union governing bodies, such as the European Commission in Brussels, Belgium (the EU's executive body), and the European System of Central Banks (ESCB), headquartered in Frankfurt, Germany.

The European Monetary System, 1979–1998

The first significant institutional step on the road to European monetary unification was the **European Monetary System (EMS)**. The eight original participants in the EMS's exchange rate mechanism—France, Germany, Italy, Belgium, Denmark, Ireland, Luxembourg, and the Netherlands—began operating a formal network of mutually pegged exchange rates in March 1979. A complex set of EMS intervention arrangements worked to restrict the exchange rates of participating currencies within specified fluctuation margins.[2]

The prospects for a successful fixed-rate area in Europe seemed bleak in early 1979, when recent yearly inflation rates ranged from Germany's 2.7 percent to Italy's 12.1 percent. Through a mixture of policy cooperation and realignment, however, the EMS fixed exchange rate club survived and even grew, adding Spain to its ranks in 1989, Britain in 1990, and Portugal early in 1992. Only in September 1992 did this growth suffer a sudden setback when Britain and Italy left the EMS exchange rate mechanism at the start of a protracted European currency crisis that forced the remaining members to retreat to very wide exchange rate margins.

The EMS's operation was aided by several safety valves that initially helped reduce the frequency of such crises. Most exchange rates "fixed" by the EMS until August 1993 actually could fluctuate up or down by as much as 2.25 percent relative to an assigned par value. A few members were able to negotiate bands of ± 6 percent, making a greater sacrifice of exchange rate stability but gaining more room to choose their own monetary policies. In August 1993, EMS countries decided to widen nearly all of the bands to ± 15 percent under the pressure of speculative attacks.

As another crucial safety valve, the EMS developed generous provisions for the extension of credit from strong- to weak-currency members. If the French franc (France's former currency) depreciated too far against the deutsche mark (or DM, Germany's former currency), Germany's central bank, the Bundesbank, was expected to lend the Bank of France DM that could be sold for francs in the foreign exchange market.

Finally, during the system's initial years of operation several members (notably France and Italy) reduced the possibility of speculative attack by maintaining *capital controls* that directly limited domestic residents' sales of home for foreign currencies.

The EMS went through periodic currency realignments. In all, 11 realignments occurred between the start of the EMS in March 1979 and January 1987. Capital controls played the important role of shielding members' reserves from speculators during these adjustments. Starting in 1987, however, a phased removal of capital controls by EMS countries increased the possibility of speculative attacks and thus reduced governments' willingness openly to consider devaluing or revaluing. The removal of controls greatly reduced member countries' monetary independence, but freedom of payments and capital movements within the EU had always been a key element of EU countries' plan to turn Europe into a unified single market.

[2] As a technical matter, all EU members were members of the EMS, but only those EMS members who enforced the fluctuation margins belonged to the EMS *exchange rate mechanism (ERM)*.

For a period of five and a half years after January 1987, no adverse economic event was able to shake the EMS's commitment to its fixed exchange rates. This state of affairs came to an end in 1992, however, as economic shocks caused by the reunification of East and West Germany in 1990 led to asymmetrical macroeconomic pressures in Germany and in its major EMS partners.

The result of reunification was a boom in Germany and higher inflation, which Germany's very inflation-averse central bank, the Bundesbank, resisted through sharply higher interest rates. Other EMS countries such as France, Italy, and the United Kingdom, however, were not simultaneously booming. By matching the high German interest rates to hold their currencies fixed against Germany's, they were unwillingly pushing their own economies into deep recession. The policy conflict between Germany and its partners led to a series of fierce speculative attacks on the EMS exchange parities starting in September 1992. By August 1993, as previously noted, the EMS was forced to retreat to very wide (±15 percent) bands, which it kept in force until the introduction of the euro in 1999.

German Monetary Dominance and the Credibility Theory of the EMS

Earlier we identified two main reasons why the European Union sought to fix internal exchange rates: a desire to defend Europe's economic interests more effectively on the world stage and the ambition to achieve greater internal economic unity.

Europe's experience of high inflation in the 1970s suggests an additional purpose that the EMS grew to fulfill. By fixing their exchange rates against the DM, the other EMS countries in effect imported the German Bundesbank's credibility as an inflation fighter and thus discouraged the development of inflationary pressures at home—pressures they might otherwise have been tempted to accommodate through monetary expansion. This view, the **credibility theory of the EMS**, holds that the political costs of violating an international exchange rate agreement may be useful. They can restrain governments from depreciating their currencies to gain the short-term advantage of an economic boom at the long-term cost of higher inflation.

Policy makers in inflation-prone EMS countries, such as Italy, clearly gained credibility by placing monetary policy decisions in the hands of the inflation-fearing German central bank. Devaluation was still possible, but only subject to EMS restrictions. Because politicians also feared that they would look incompetent to voters if they devalued, a government's decision to peg to the DM reduced both its willingness and its ability to create domestic inflation.[3]

Added support for the credibility theory comes from the behavior of inflation rates relative to Germany's, shown in Figure 20-2 for six of the other original EMS members.[4] As the figure shows, annual inflation rates gradually converged toward the low German levels.[5]

[3] The general theory that an inflation-prone country gains from vesting its monetary policy decisions with a "conservative" central bank is developed in an influential paper by Kenneth Rogoff. See "The Optimal Degree of Commitment to an Intermediate Monetary Target," *Quarterly Journal of Economics* 100 (November 1985), pp. 1169–1189. For application to the EMS, see Francesco Giavazzi and Marco Pagano, "The Advantage of Tying One's Hands: EMS Discipline and Central Bank Credibility," *European Economic Review* 32 (June 1988), pp. 1055–1082.

[4] Figure 20-2 does not include the tiny country of Luxembourg because before 1999, that country had a currency union with Belgium and an inflation rate very close to Belgium's.

[5] Those skeptical of the credibility theory of EMS inflation convergence point out that the United States, Britain, and Japan also reduced inflation to low levels over the 1980s, but did so without fixing their exchange rates. Many other countries have done the same since.

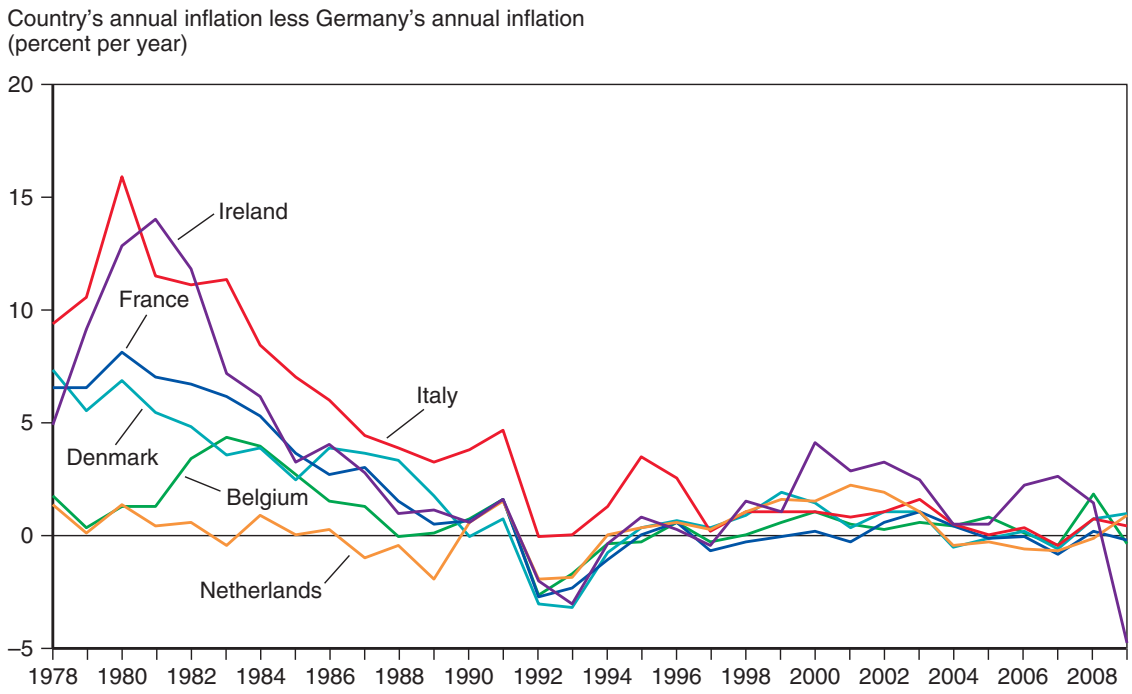


Figure 20-2

Inflation Convergence for Six Original EMS Members, 1978–2009

Shown are the differences between domestic inflation and German inflation for six of the original EMS members: Belgium, Denmark, France, Ireland, Italy, and the Netherlands.

Source: CPI inflation rates from International Monetary Fund, *International Financial Statistics*.

Market Integration Initiatives

The EU countries have tried to achieve greater internal economic unity not only by fixing mutual exchange rates, but also through direct measures to encourage the free flow of goods, services, and factors of production. Later in this chapter you will learn that the extent of product and factor market integration within Europe helps to determine how fixed exchange rates affect Europe's macroeconomic stability. Europe's efforts to raise *microeconomic* efficiency through direct market liberalization have also increased its preference for mutually fixed exchange rates on *macroeconomic* grounds.

The process of market unification that began when the original EU members formed their customs union in 1957 was still incomplete 30 years later. In a number of industries, such as automobiles and telecommunications, trade within Europe was discouraged by government-imposed standards and registration requirements. Often government licensing or purchasing practices gave domestic producers virtual monopoly positions in their home markets. In the Single European Act of 1986 (which amended the founding Treaty of Rome), EU members took the crucial political steps to remove remaining internal barriers to trade, capital movements, and labor migration. Most important, they dropped the Treaty of Rome's requirement of unanimous consent for measures related to market completion, so that one or two self-interested EU members could not block trade liberalization measures as in the past. Further moves toward market integration have followed.

Financial capital, for example, now can move quite freely, not only within the European Union, but also between the European Union and outside jurisdictions.

European Economic and Monetary Union

Countries can link their currencies together in many ways. We can imagine that the different modes of linkage form a spectrum, with the arrangements at one end requiring little sacrifice of monetary policy independence and those at the other end requiring independence to be given up entirely.

The early EMS, characterized by frequent currency realignments and widespread government control over capital movements, left some scope for national monetary policies. In 1989 a committee headed by Jacques Delors, president of the European Commission, recommended a three-stage transition to a goal at the extreme end of the policy spectrum just described. That goal was an **economic and monetary union (EMU)**, a European Union in which national currencies would be replaced by a single EU currency managed by a sole central bank operating on behalf of all EU members.

On December 10, 1991, the leaders of the EU countries met at the ancient Dutch city of Maastricht and agreed to propose for national ratification far-reaching amendments to the Treaty of Rome. These amendments were meant to place the EU squarely on the road to EMU. Included in the 250-page **Maastricht Treaty** was a provision calling for the introduction of a single European currency and a European Central Bank no later than January 1, 1999. By 1993, all 12 countries then belonging to the EU had ratified the Maastricht Treaty. The 15 countries that joined the EU afterward accepted the Treaty's provisions upon joining (see Figure 20-1).[6]

Why did the EU countries move away from the EMS and toward the much more ambitious goal of a single shared currency? There were four reasons:

1. They believed a single EU currency would produce a greater degree of European market integration than fixed exchange rates by removing the threat of EMS currency realignments and eliminating the costs to traders of converting one EMS currency into another. The single currency was viewed as a necessary complement to plans for melding EU markets into a single, continent-wide market.
2. Some EU leaders thought that Germany's management of EMS monetary policy had placed a one-sided emphasis on German macroeconomic goals at the expense of its EMS partners' interests. The European Central Bank that would replace the German Bundesbank under EMU would have to be more considerate of other countries' problems, and it would automatically give those countries the same opportunity as Germany to participate in system-wide monetary policy decisions.
3. Given the move to complete freedom of capital movements within the EU, there seemed to be little to gain, and much to lose, from keeping national currencies with fixed (but adjustable) parities rather than irrevocably locking parities through a single currency. Any system of fixed exchange rates among distinct national currencies would be subject to ferocious speculative attacks, as in 1992–1993. If Europeans wished to combine permanently fixed exchange rates with freedom of capital movements, a single currency was the best way to accomplish this.

[6] Denmark and the United Kingdom, however, ratified the Maastricht Treaty subject to special exceptions that allow them to "opt out" of the treaty's monetary provisions and retain their national currencies. Sweden has no formal opt out, but it has exploited other technicalities in the Maastricht Treaty to avoid joining the euro zone so far.

4. As previously noted, all of the EU countries' leaders hoped the Maastricht Treaty's provisions would guarantee the political stability of Europe. Beyond its purely economic functions, the single EU currency was intended as a potent symbol of Europe's desire to place cooperation ahead of the national rivalries that often had led to war in the past. Under this scenario, the new currency would align the economic interests of individual European nations to create an overwhelming political constituency for peace on the continent.

The Maastricht Treaty's critics denied that EMU would have these positive effects and opposed the treaty's provisions for vesting stronger governmental powers with the European Union. To these critics, EMU was symptomatic of a tendency for the European Union's central institutions to ignore local needs, meddle in local affairs, and downgrade prized symbols of national identity (including, of course, national currencies). Germany's citizens in particular, scarred by memories of severe postwar inflations, feared that the new European Central Bank would not fight inflation as fiercely as their Bundesbank did.

The Euro and Economic Policy in the Euro Zone

How were the initial members of EMU chosen, how are new members admitted, and what is the structure of the complex of financial and political institutions that govern economic policy in the euro zone? This section provides an overview.

The Maastricht Convergence Criteria and the Stability and Growth Pact

The Maastricht Treaty requires EU countries to satisfy several macroeconomic convergence criteria prior to admission to EMU. Among these criteria are:

1. The country's inflation rate in the year before admission must be no more than 1.5 percent above the average rate of the three EU member states with the lowest inflation.
2. The country must have maintained a stable exchange rate within the ERM without devaluing on its own initiative.
3. The country must have a public-sector deficit no higher than 3 percent of its GDP (except in exceptional and temporary circumstances).
4. The country must have a public debt that is below or approaching a reference level of 60 percent of its GDP.

The treaty provides for the ongoing monitoring of criteria 3 and 4 above by the European Commission even after admission to EMU, and for the levying of penalties on countries that violate these fiscal rules and do not correct situations of "excessive" deficits and debt. The surveillance and sanctions over high deficits and debts place national governments under constraints in the exercise of their national fiscal powers. For example, a highly indebted EMU country facing a national recession might be unable to use expansionary fiscal policy for fear of breaching the Maastricht limits—a possibly costly loss of policy autonomy, given the absence of a national monetary policy!

In addition, a supplementary **Stability and Growth Pact (SGP)** negotiated by European leaders in 1997 tightens the fiscal straitjacket further. The SGP sets out "the medium-term budgetary objective of positions close to balance or in surplus." It also sets a timetable for the imposition of financial penalties on countries that fail to correct situations of "excessive" deficits and debt promptly enough. What explains the macroeconomic convergence criteria, the fear of high public debts, and the SGP? Before they would sign the Maastricht

Treaty, low-inflation countries such as Germany wanted assurance that their EMU partners had learned to prefer an environment of low inflation and fiscal restraint. They feared that otherwise, the euro might be a weak currency, falling prey to the types of policies that have fueled French, Greek, Italian, Portuguese, Spanish, and United Kingdom inflation at various points since the early 1970s. A highly indebted government that continues to borrow may find that the market demand for its bonds disappears. Another fear about EMU was that the new European Central Bank would face pressures to purchase government debt directly in such situations, thereby fueling money supply growth and inflation. Voters in traditionally low-inflation countries worried that prudent governments within EMU would be forced to pick up the tab for profligate governments that borrowed more than they could afford to repay.

As EMU came closer in 1997, German public opinion therefore remained opposed to the euro. The German government demanded the SGP as a way of convincing domestic voters that the new eurosystem would indeed produce low inflation. Ironically, Germany (along with France) is one of the countries that was subsequently in violation of the Maastricht fiscal rules! At French and German urging, the EU watered down the SGP in 2005. Thus, the SGP has never been enforced in practice—even though later experience showed some of the concerns that motivated it to be valid, as we shall see. Had the SGP had some "bite," it might have proven an additional constraint (along with the sacrifice of monetary autonomy) on national economic policy, which helps explain why it has effectively been abandoned.

By May 1998, it was clear that 11 EU countries had satisfied the convergence criteria on the basis of 1997 data and would be founding members of EMU: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain. Greece failed to qualify on any of the criteria in 1998, although it ultimately appeared to pass all of its tests and entered EMU on January 1, 2001. Since then, Slovenia (on January 1, 2007), Cyprus and Malta (both on January 1, 2008), the Slovak Republic (January 1, 2009), and Estonia (January 1, 2011) also have joined the euro zone.

The European System of Central Banks

The European System of Central Banks (ESCB), which conducts monetary policy for the euro zone, consists of the European Central Bank (ECB) in Frankfurt plus the 17 national central banks, which now play a role analogous to the regional Federal Reserve banks in the United States. Decisions of the ESCB are made by votes of the governing council of the ECB, consisting of the ECB executive board (including the president of the ECB) and the heads of the national central banks.

The authors of the Maastricht Treaty hoped to create an independent central bank free of the political influences that might lead to inflation.[7] The treaty gives the ESCB an overriding mandate to pursue price stability and includes many provisions intended to insulate monetary policy decisions from political influence. In addition, unlike any other central bank in the world, the ESCB operates above and beyond the reach of any single national government.

[7] Several studies show that central bank independence appears to be associated with lower inflation. See, for example, Vittorio Grilli, Donato Masciandaro, and Guido Tabellini, "Political and Monetary Institutions and Public Financial Policies in the Industrial Countries," *Economic Policy* 13 (October 1991), pp. 341–392; and Alberto Alesina and Lawrence H. Summers, "Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence," *Journal of Money, Credit and Banking* 25 (May 1993), pp. 151–162. Empirical studies such as these have helped to promote central bank independence around the world. For a critical view of this literature, see Adam Posen, "Declarations Are Not Enough: Financial Sector Sources of Central Bank Independence," *NBER Macroeconomics Annual* 10 (1995), pp. 253–274. A more recent assessment is offered by Christopher Crowe and Ellen E. Meade, "Central Bank Independence and Transparency: Evolution and Effectiveness," *European Journal of Political Economy* 24 (December 2008), pp. 763–777.

In the United States, for example, Congress could easily pass laws reducing the independence of the Federal Reserve. In contrast, while the ESCB is required to brief the European Parliament regularly on its activities, the European Parliament has no power to alter the ESCB's statute. That would require an amendment to the Maastricht Treaty approved by legislatures or voters in every member country of the EU. However, critics of the treaty argue that it goes too far in shielding the ESCB from normal democratic processes.

The Revised Exchange Rate Mechanism

For EU countries that are not yet members of EMU, a revised exchange rate mechanism—referred to as ERM 2—defines broad exchange rate zones against the euro (±15 percent) and specifies reciprocal intervention arrangements to support these target zones. ERM 2 was viewed as necessary to discourage competitive devaluations against the euro by EU members outside the euro zone and to give would-be EMU entrants a way of satisfying the Maastricht Treaty's exchange rate stability convergence criterion. Under ERM 2 rules, either the ECB or the national central bank of an EU member with its own currency can suspend euro intervention operations if they result in money supply changes that threaten to destabilize the domestic price level. ERM 2 is therefore asymmetric, with peripheral countries pegging to the euro and adjusting passively to ECB decisions on interest rates.

The Theory of Optimum Currency Areas

There is little doubt that the European monetary integration process has helped advance the *political* goals of its founders by giving the European Union a stronger position in international affairs. The survival and future development of the European monetary experiment depend more heavily, however, on its ability to help countries reach their *economic* goals. Here the picture is less clear because a country's decision to fix its exchange rate can in principle lead to economic sacrifices as well as benefits.

We saw in Chapter 19 that by changing its exchange rate, a country may succeed in cushioning the disruptive impact of various economic shocks. On the other hand, exchange rate flexibility can have potentially harmful effects, such as making relative prices less predictable or undermining the government's resolve to keep inflation in check. To weigh the economic costs against the advantages of joining a group of countries with mutually fixed exchange rates, we need a framework for thinking systematically about the stabilization powers a country sacrifices and the gains in efficiency and credibility it may reap.

In this section we show that a country's costs and benefits from joining a fixed exchange rate area such as the EMS depend on how integrated its economy is with those of its potential partners. The analysis leading to this conclusion, which is known as the theory of **optimum currency areas**, predicts that fixed exchange rates are most appropriate for areas closely integrated through international trade and factor movements.[8]

Economic Integration and the Benefits of a Fixed Exchange Rate Area: The *GG* Schedule

Consider how an individual country, for example, Norway, might approach the decision of whether to join an area of fixed exchange rates, for example, the euro zone. Our goal is to develop a simple diagram that clarifies Norway's choice.

[8] The original reference is Robert A. Mundell's classic article "The Theory of Optimum Currency Areas," *American Economic Review* 51 (September 1961), pp. 717–725. Subsequent contributions are summarized in the book by Tower and Willett listed in Further Readings.

We begin by deriving the first of two elements in the diagram, a schedule called *GG* that shows how the potential gain to Norway from joining the euro zone depends on Norway's trading links with that region. Let us assume that Norway is considering pegging its currency, the krone, to the euro.

A major economic benefit of fixed exchange rates is that they simplify economic calculations and, compared to floating rates, provide a more predictable basis for decisions that involve international transactions. Imagine the time and resources American consumers and businesses would waste every day if each of the 50 United States had its own currency that fluctuated in value against the currencies of all the other states! Norway faces a similar disadvantage in its trade with the euro zone when it allows its krone to float against the euro. The **monetary efficiency gain** from joining the fixed exchange rate system equals the joiner's savings from avoiding the uncertainty, confusion, and calculation and transaction costs that arise when exchange rates float.[9]

In practice, it may be hard to attach a precise number to the total monetary efficiency gain Norway would enjoy as a result of pegging to the euro. We can be sure, however, that this gain will be higher if Norway trades a lot with euro zone countries. For example, if Norway's trade with the euro zone amounts to 50 percent of its GNP while its trade with the United States amounts to only 5 percent of GNP, then, other things equal, a fixed krone/euro exchange rate clearly yields a greater monetary efficiency gain to Norwegian traders than a fixed krone/dollar rate. Similarly, the efficiency gain from a fixed krone/euro rate is greater when trade between Norway and the euro zone is extensive than when it is small.

The monetary efficiency gain from pegging the krone to the euro will also be higher if factors of production can migrate freely between Norway and the euro area. Norwegians who invest in euro zone countries benefit when the returns on their investments are more predictable. Similarly, Norwegians who work in euro zone countries may benefit if a fixed exchange rate makes their wages more stable relative to Norway's cost of living.

Our conclusion is that *a high degree of economic integration between a country and a fixed exchange rate area magnifies the monetary efficiency gain the country reaps when it fixes its exchange rate against the area's currencies*. The more extensive are cross-border trade and factor movements, the greater is the gain from a fixed cross-border exchange rate.

The upward-sloping *GG* curve in Figure 20-3 shows the relation between a country's degree of economic integration with a fixed exchange rate area and the monetary efficiency gain to the country from joining the area. The figure's horizontal axis measures the extent to which Norway (the joining country in our example) is economically integrated into euro zone product and factor markets. The vertical axis measures the monetary efficiency gain to Norway from pegging to the euro. *GG*'s positive slope reflects the conclusion that the monetary efficiency gain a country gets by joining a fixed exchange rate area rises as its economic integration with the area increases.

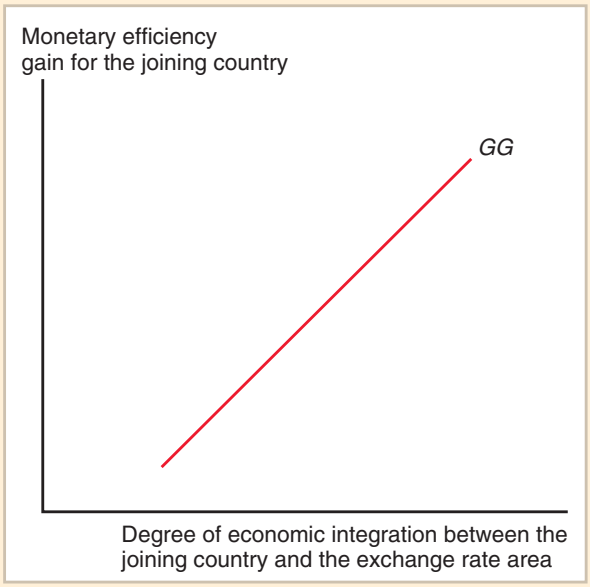
In our example we have implicitly assumed that the larger exchange rate area, the euro zone, has a stable and predictable price level. If it does not, the greater variability in Norway's price level that would follow a decision to join the exchange rate area would likely offset any monetary efficiency gain a fixed exchange rate might provide. A different problem arises if Norway's commitment to fix the krone's exchange rate is not fully believed by economic actors. In this situation, some exchange rate uncertainty would remain and Norway would therefore enjoy a smaller monetary efficiency gain. If the euro zone's price level is stable and Norway's exchange rate commitment is firm, however, the

[9] To illustrate just one component of the monetary efficiency gain, potential savings of commissions paid to brokers and banks on foreign exchange transactions, Charles R. Bean of the Bank of England estimated that in 1992, a "round-trip" through all the European Union currencies would result in the loss of fully *half* the original sum. See the paper by Bean in this chapter's Further Readings.

Figure 20-3

The *GG* Schedule

The upward-sloping *GG* schedule shows that a country's monetary efficiency gain from joining a fixed exchange rate area rises as the country's economic integration with the area rises.



main conclusion follows: When Norway pegs to the euro, it gains from the stability of its currency against the euro, and this efficiency gain is greater the more closely tied are Norway's markets with euro zone markets.

Earlier in this chapter we learned that a country may wish to peg its exchange rate to an area of price stability to import the anti-inflationary resolve of the area's monetary authorities. When the economy of the pegging country is well integrated with that of the low-inflation area, however, low domestic inflation is easier to achieve. The reason is that close economic integration leads to international price convergence and therefore lessens the scope for independent variation in the pegging country's price level. This argument provides another reason why high economic integration with a fixed exchange rate area enhances a country's gain from membership.

Economic Integration and the Costs of a Fixed Exchange Rate Area: The *LL* Schedule

Membership in an exchange rate area may involve costs as well as benefits, even when the area has low inflation. These costs arise because a country that joins an exchange rate area gives up its ability to use the exchange rate and monetary policy for the purpose of stabilizing output and employment. This **economic stability loss** from joining, like the country's monetary efficiency gain, is related to the country's economic integration with its exchange rate partners. We can derive a second schedule, the *LL* schedule, that shows the relationship graphically.

In Chapter 19's discussion of the relative merits of fixed and floating exchange rates, we concluded that when the economy is disturbed by a change in the output market (that is, by a shift in the *DD* schedule), a floating exchange rate has an advantage over a fixed rate: It automatically cushions the economy's output and employment by allowing an immediate change in the relative price of domestic and foreign goods. Furthermore, you will recall from Chapter 18 that when the exchange rate is fixed, purposeful stabilization is more difficult to achieve because monetary policy has no power at all to affect domestic output. Given these two conclusions, we would expect changes in the *DD* schedule to have more severe effects on an economy in which the monetary authority is required to fix the

exchange rate against a group of foreign currencies. The *extra* instability caused by the fixed exchange rate is the economic stability loss.[10]

To derive the *LL* schedule, we must understand how the extent of Norway's economic integration with the euro zone will affect the size of this loss in economic stability. Imagine that Norway is pegging to the euro and that there is a fall in the aggregate demand for Norway's output—a leftward shift of Norway's *DD* schedule. If the *DD* schedules of the other euro zone countries happen simultaneously to shift to the left, the euro will simply depreciate against outside currencies, providing the automatic stabilization we studied in the last chapter. Norway has a serious problem only when it *alone* faces a fall in demand—for example, if the world demand for oil, one of Norway's main exports, drops.

How will Norway adjust to this shock? Since nothing has happened to budge the euro, to which Norway is pegged, its krone will remain stable against *all* foreign currencies. Thus, full employment will be restored only after a period of costly slump during which the prices of Norwegian goods and the wages of Norwegian workers fall.

How does the severity of this slump depend on the level of economic integration between the Norwegian economy and those of the EMU countries? The answer is that greater integration implies a shallower slump, and therefore a less costly adjustment to the adverse shift in *DD*. There are two reasons for this reduction in the cost of adjustment: First, if Norway has close trading links with the euro zone, a small reduction in its prices will lead to an increase in euro zone demand for Norwegian goods that is large relative to Norway's output. Thus, full employment can be restored fairly quickly. Second, if Norway's labor and capital markets are closely meshed with those of its euro zone neighbors, unemployed workers can easily move abroad to find work, and domestic capital can be shifted to more profitable uses in other countries. The ability of factors to migrate abroad thus reduces the severity of unemployment in Norway and the fall in the rate of return available to investors.[11]

Notice that our conclusions also apply to a situation in which Norway experiences an *increase* in demand for its output (a rightward shift of *DD*). If Norway is tightly integrated with euro zone economies, a small increase in Norway's price level, combined

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10 You might think that when Norway unilaterally fixes its exchange rate against the euro but leaves the krone free to float against noneuro currencies, it is able to keep at least some monetary independence. Perhaps surprisingly, this intuition is *wrong.* The reason is that any independent money supply change in Norway would put pressure on krone interest rates and thus on the krone/euro exchange rate. So by pegging the krone even to a single foreign currency, Norway completely surrenders its domestic monetary control. This result has, however, a positive side for Norway. After Norway unilaterally pegs the krone to the euro, domestic money market disturbances (shifts in the *AA* schedule) will no longer affect domestic output, despite the continuing float against noneuro currencies. Why? Because Norway's interest rate must equal the euro interest rate, any pure shifts in *AA* will result in immediate reserve inflows or outflows that leave Norway's interest rate unchanged. Thus, a krone/euro peg alone is enough to provide automatic stability in the face of any monetary shocks that shift the *AA* schedule. This is why the discussion in the text can focus on shifts in the *DD* schedule.

11 Installed plant and equipment typically are costly to transport abroad or to adapt to new uses. Owners of such relatively immobile Norwegian capital therefore will always earn low returns on it after an adverse shift in the demand for Norwegian products. If Norway's capital market is integrated with those of its EMU neighbors, however, Norwegians will invest some of their wealth in other countries, while at the same time part of Norway's capital stock will be owned by foreigners. As a result of this process of international wealth *diversification* (see Chapter 21), unexpected changes in the return to Norway's capital will automatically be shared among investors throughout the fixed exchange rate area. Thus, even owners of capital that cannot be moved can avoid more of the economic stability loss due to fixed exchange rates when Norway's economy is open to capital flows.

When international labor mobility is low or nonexistent, higher international capital mobility may *not* reduce the economic stability loss from fixed exchange rates, as we discuss in evaluating the European experience in the Case Study on pp. 572–578.

with some movement of foreign capital and labor into Norway, quickly eliminates the excess demand for Norwegian products.[12]

Closer trade links between Norway and countries *outside* the euro zone will also aid the country's adjustment to Norwegian *DD* shifts that are not simultaneously experienced by the euro zone. However, greater trade integration with countries outside the euro zone is a two-edged sword, with negative as well as positive implications for macroeconomic stability. The reason is that when Norway pegs the krone to the euro, euro zone disturbances that change the euro's exchange rate will have more powerful effects on Norway's economy when its trading links with noneuro countries are more extensive. The effects would be analogous to an increase in the size of movements in Norway's *DD* curve and would raise Norway's economic stability loss from pegging to the euro. In any case, these arguments do not change our earlier conclusion that Norway's stability loss from fixing the krone/euro exchange rate falls as the extent of its economic integration with the euro zone rises.

An additional consideration that we have not yet discussed strengthens the argument that the economic stability loss to Norway from pegging to the euro is lower when Norway and the euro zone engage in a large volume of trade. Since imports from the euro zone make up a large fraction of Norwegian workers' consumption in this case, changes in the krone/euro exchange rate may quickly affect nominal Norwegian wages, reducing any impact on employment. A depreciation of the krone against the euro, for example, causes a sharp fall in Norwegians' living standards when imports from the euro zone are substantial; workers are thus likely to demand higher nominal wages from their employers to compensate for the loss. In this situation the additional macroeconomic stability Norway gets from a floating exchange rate is small, so the country has little to lose by fixing the krone/euro exchange rate.

We conclude that *a high degree of economic integration between a country and the fixed exchange rate area that it joins reduces the resulting economic stability loss due to output market disturbances*.

The *LL* schedule shown in Figure 20-4 summarizes this conclusion. The figure's horizontal axis measures the joining country's economic integration with the fixed exchange rate area, the vertical axis the country's economic stability loss. As we have seen, *LL* has a negative slope because the economic stability loss from pegging to the area's currencies falls as the degree of economic interdependence rises.

The Decision to Join a Currency Area: Putting the *GG* and *LL* Schedules Together

Figure 20-5 combines the *GG* and *LL* schedules to show how Norway should decide whether to fix the krone's exchange rate against the euro. The figure implies that Norway should do so if the degree of economic integration between Norwegian markets and those of the euro zone is at least equal to θ_1, the integration level determined by the intersection of *GG* and *LL* at point 1.

Let's see why Norway should peg to the euro if its degree of economic integration with euro zone markets is at least θ_1. Figure 20-5 shows that for levels of economic integration below θ_1, the *GG* schedule lies below the *LL* schedule. Thus, the loss Norway would suffer from greater output and employment instability after joining exceeds the monetary efficiency gain, and the country would do better to stay out.

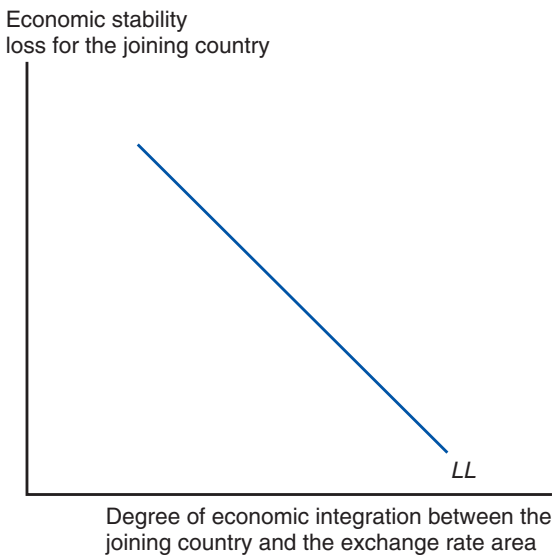
When the degree of integration is θ_1 or higher, however, the monetary efficiency gain measured by *GG* is greater than the stability sacrifice measured by *LL*, and pegging the

[12] The preceding reasoning applies to other economic disturbances that fall unequally on Norway's output market and those of its exchange rate partners. A problem at the end of this chapter asks you to think through the effects of an increase in demand for EMU exports that leaves Norway's export demand schedule unchanged.

Figure 20-4

The *LL* Schedule

The downward-sloping *LL* schedule shows that a country's economic stability loss from joining a fixed exchange rate area falls as the country's economic integration with the area rises.



krone's exchange rate against the euro results in a net gain for Norway. Thus the intersection of *GG* and *LL* determines the minimum integration level (here, θ_1) at which Norway will desire to peg its currency to the euro.

The *GG-LL* framework has important implications about how changes in a country's economic environment affect its willingness to peg its currency to an outside currency area. Consider, for example, an increase in the size and frequency of sudden shifts in the demand for the country's exports. As shown in Figure 20-6, such a change pushes LL^1 upward to LL^2. At any level of economic integration with the currency area, the extra output and unemployment instability the country suffers by fixing its exchange rate is now greater. As a result, the level of economic integration at which it becomes worthwhile to join the currency area rises to θ_2 (determined by the intersection of *GG* and LL^2 at point 2). Other things equal, increased variability in their product markets makes countries

Figure 20-5

Deciding When to Peg the Exchange Rate

The intersection of *GG* and *LL* at point 1 determines a critical level of economic integration, θ_1, between a fixed exchange rate area and a country considering whether to join. At any level of integration above θ_1, the decision to join yields positive net economic benefits to the joining country.

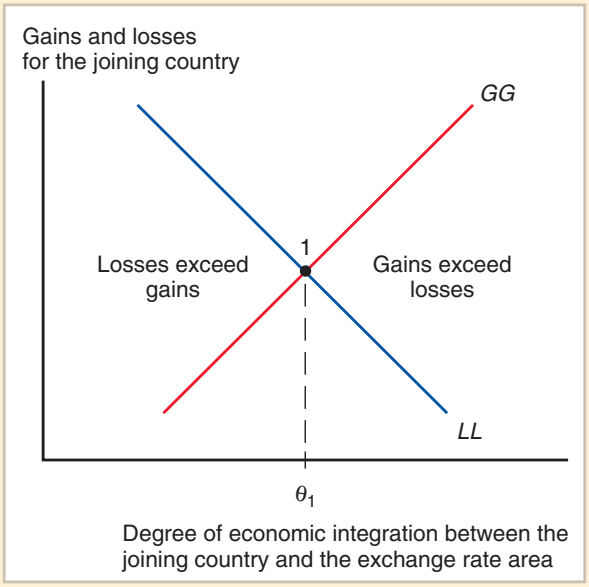
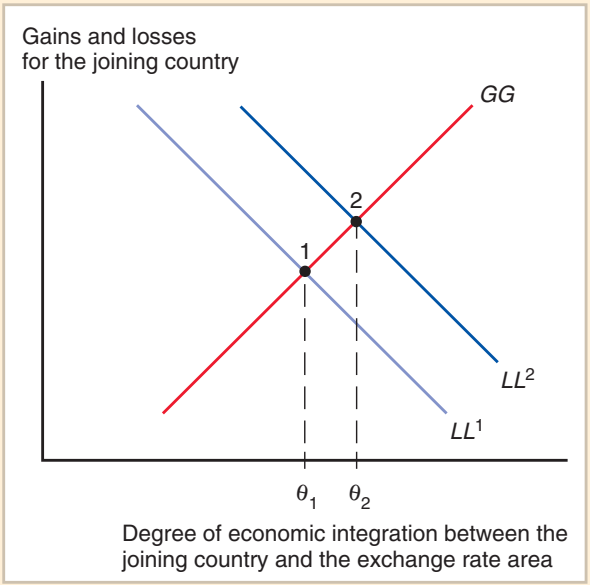


Figure 20-6

An Increase in Output Market Variability

A rise in the size and frequency of country-specific disturbances to the joining country's product markets shifts the *LL* schedule upward from LL^1 to LL^2 because for a given level of economic integration with the fixed exchange rate area, the country's economic stability loss from pegging its exchange rate rises. The shift in *LL* raises the critical level of economic integration at which the exchange rate area is joined to θ_2.



less willing to enter fixed exchange rate areas—a prediction that helps explain why the oil price shocks after 1973 made countries unwilling to revive the Bretton Woods system of fixed exchange rates (Chapter 19).

What Is an Optimum Currency Area?

The *GG-LL* model we have developed suggests a theory of the optimum currency area. *Optimum currency areas* are groups of regions with economies closely linked by trade in goods and services and by factor mobility. This result follows from our finding that a fixed exchange rate area will best serve the economic interests of each of its members if the degree of output and factor trade among the included economies is high.

This perspective helps us understand, for example, why it may make sense for the United States, Japan, and Europe to allow their mutual exchange rates to float. Even though these regions trade with each other, the extent of that trade is modest compared with regional GNPs, and interregional labor mobility is low. In 2009, for example, U.S. merchandise trade with Western Europe (measured as the average of imports and exports) amounted to less than 2 percent of U.S. GNP; U.S. merchandise trade with Japan was less than a third as big.

The more interesting question, and the critical one for judging the economic success of EMU, is whether Europe itself makes up an optimum currency area. We take up this topic next.

Case Study

Is Europe an Optimum Currency Area?

The theory of optimum currency areas gives us a useful framework for thinking about the considerations that determine whether a group of countries will gain or lose by fixing their mutual exchange rates. A nation's gains and losses from pegging its currency to an exchange rate area are hard to measure numerically, but by combining our theory with information on actual economic performance, we can evaluate the claim that Europe, most of which is likely to adopt or peg to the euro, is an optimum currency area.

The Extent of Intra-European Trade

Our earlier discussion suggested that a country is more likely to benefit from joining a currency area if the area's economy is closely integrated with the country's. The overall degree of economic integration can be judged by looking at the integration of product markets, that is, the extent of trade between the joining country and the currency area, and at the integration of factor markets, that is, the ease with which labor and capital can migrate between the joining country and the currency area.

In January 1999, at the time of the euro's launch, most EU members exported from 10 to 20 percent of their output to other EU members. That number is far larger than the extent of EU–U.S. trade, but smaller than the amount of trade between regions of the United States. If we take trade relative to GNP as a measure of goods-market integration, the *GG-LL* model of the last section suggests that a joint float of Europe's currencies against those of the rest of the world is a better strategy for EU members than a fixed dollar/euro exchange rate would be. The extent of intra-European trade in 1999, however, was not large enough to convey an overwhelming reason for believing that the European Union itself was then an optimum currency area.

EU measures aimed at promoting market integration following the Single European Act of 1986 probably have helped. For some goods (such as consumer electronics), there has been considerable price convergence across EU countries, but for others, among them cars, similar items still can sell for widely differing prices in different European locations. One hypothesis about the persistence of price differentials that is favored by euro enthusiasts is that multiple currencies made big price discrepancies possible, but these were bound to disappear under the single currency. Has the euro itself contributed to market integration? In a careful study of European price behavior since 1990, economists Charles Engel of the University of Wisconsin and John Rogers of the Federal Reserve find that intra-European price discrepancies indeed decreased over the 1990s. They find no evidence, however, of further price convergence after the euro's introduction in 1999.[13]

A more optimistic view comes from looking at the volume of intra-European trade, shown in Figure 20-7. While the extent of that trade has fluctuated since the mid-1980s, its pronounced growth after the start of EMU suggests that the single currency itself has encouraged commerce among EU countries, moving them closer to forming an optimum currency area.

Interregional trade in the United States remains greater than intra-EU trade, although it remains to be seen how far the European integration process will go. At the time the euro was launched, supporters entertained high hopes about the extent to which the euro would promote trade within the currency union. These hopes were bolstered by an influential econometric study by Andrew K. Rose, of the University of California–Berkeley, who suggested that on average, members of currency unions trade three times more with each other

[13] See their paper "European Product Market Integration after the Euro," *Economic Policy* 39 (July 2004), pp. 347–381. For further confirmation, see Jesús Crespo Cuaresma, Balázs Égert, and Maria Antoinette Silgoner, "Price Level Convergence in Europe: Did the Introduction of the Euro Matter?" *Monetary Policy and the Economy*, Oesterreichische Nationalbank (Q1 2007), pp. 100–113.

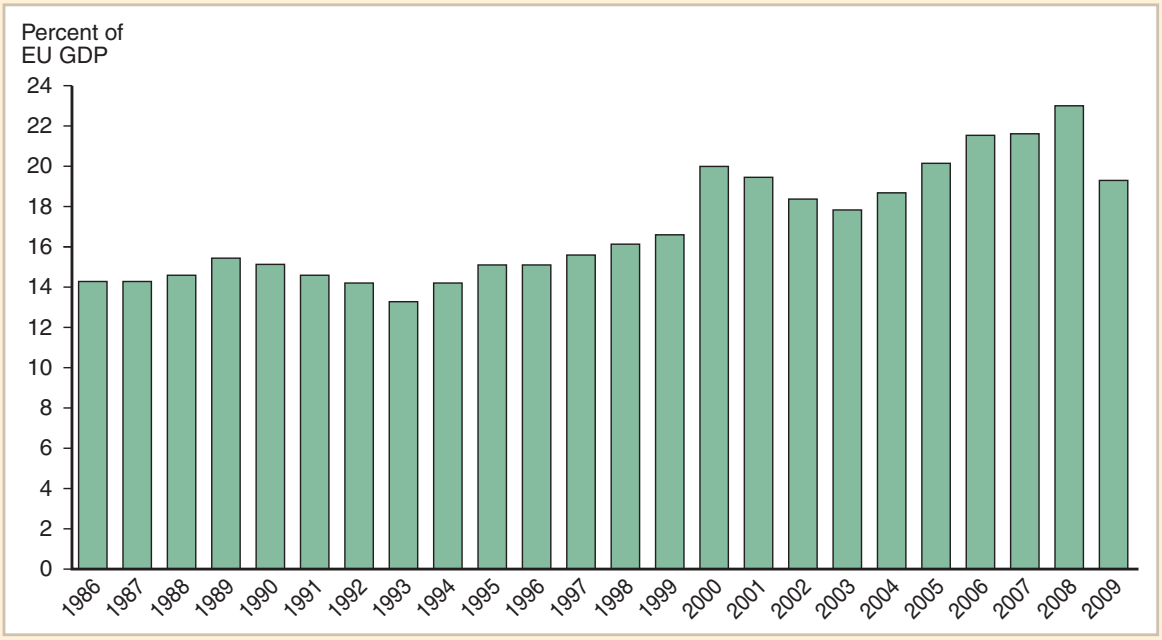


Figure 20-7

Intra-EU Trade as a Percent of EU GDP

Trade of EU countries with other EU countries increased after the euro was introduced at the start of 1999. In constructing the figure, the extent of an EU country's trade with EU members is defined as the average of its imports from and exports to other EU countries. The numbers shown are calculated from total intra-EU trade (for all EU members) divided by the total GDP of the EU.

Sources: *OECD Statistical Yearbook* and Eurostat.

than with nonmember countries—even after one controls for other determinants of trade flows. A more recent study of EU trade data by Richard Baldwin, of Geneva's Graduate Institute of International and Development Studies, has greatly scaled back the estimates as they apply to the euro zone's experience so far.[14] Baldwin's best estimate was that the euro increased the mutual trade levels of its users only by about 9 percent, with most of the effect taking place in the euro's first year, 1999. But he also concluded that Britain, Denmark, and Sweden, which did not adopt the euro, saw their trade with euro zone countries increase by about 7 percent at the same time, and that they therefore would gain little more if they adopted the euro. On balance, considering both the price and the quantity evidence to date, it seems unlikely that the combination of Single European Act reforms and the single currency has yet turned the euro zone into an optimum currency area.

[14] See Baldwin, *In or Out: Does It Matter? An Evidence-Based Analysis of the Euro's Trade Effects* (London: Centre for Economic Policy Research, 2006). Rose reports his initial analysis and results in "One Money, One Market: The Effects of Common Currencies on Trade," *Economic Policy* 30 (April 2000), pp. 8–45. He based his methods on the "gravity model" of international trade (Chapter 2). Rose scaled down his estimate in Andrew K. Rose and Eric van Wincoop, "National Money as a Barrier to International Trade: The Real Case for Currency Union," *American Economic Review* 91 (May 2001), pp. 386–390. Using a more sophisticated model of international trade patterns, Rose and van Wincoop calculated the trade-creating effect of a currency union to be roughly a 50 percent increase in trade.

How Mobile Is Europe's Labor Force?

The main barriers to labor mobility within Europe are no longer due to border controls. Differences in language and culture discourage labor movements between European countries to a greater extent than is true, for example, between regions of the United States. In one econometric study comparing unemployment patterns in U.S. regions with those in EU countries, Barry Eichengreen of the University of California–Berkeley found that differences in regional unemployment rates are smaller and less persistent in the United States than are the differences between national unemployment rates in the European Union.[15]

Even *within* European countries, labor mobility appears limited, partly because of government regulations. For example, the requirement in some countries that workers establish residence before receiving unemployment benefits makes it harder for unemployed workers to seek jobs in regions that are far from their current homes. Table 20-2 presents evidence on the frequency of regional labor movement in three of the largest EU countries, as compared with that in the United States. Although these data must be interpreted with caution because the definition of "region" differs from country to country, they do suggest that in a typical year, Americans are significantly more footloose than Europeans.[16]

Asymmetric Macroeconomic Shocks

The first decade of the euro was characterized by quite different economic performance among the currency union's members. The European Central Bank's monetary policy stance probably was not appropriate for all participants. One result was some divergence in inflation rates, which had two consequences.

First, with the coming of the euro, and even for several years before as markets anticipated that intra-EU exchange rates would stabilize, *nominal* long-term interest rates on bonds converged. Because inflation generally was higher in Ireland and southern Europe (Portugal, Italy, Spain, and Greece), however, *real* long-term interest rates in those countries fell relative to those in Germany, further stimulating demand, growth, and

TABLE 20-2 People Changing Region of Residence in the 1990s (percent of total population)

Britain	Germany	Italy	United States
1.7	1.1	0.5	3.1

Sources: Peter Huber, "Inter-regional Mobility in Europe: A Note on the Cross-Country Evidence," *Applied Economics Letters* 11 (August 2004), pp. 619–624; and "Geographical Mobility, 2003–2004," U.S. Department of Commerce, March 2004. Table data are for Britain in 1996, Germany in 1990, Italy in 1999, and the United States in 1999.

[15] See Eichengreen, "One Money for Europe? Lessons of the U.S. Currency Union," *Economic Policy* 10 (April 1990), pp. 118–166. Further study of the U.S. labor market has shown that regional unemployment is eliminated almost entirely by worker migration rather than by changes in regional real wages. This pattern of labor market adjustment is unlikely to be possible in Europe in the near future. See Olivier Jean Blanchard and Lawrence F. Katz, "Regional Evolutions," *Brookings Papers on Economic Activity* 1 (1992), pp. 1–75.

[16] For a more detailed discussion of the evidence, see Maurice Obstfeld and Giovanni Peri, "Regional Non-Adjustment and Fiscal Policy," *Economic Policy* 26 (April 1998), pp. 205–259.

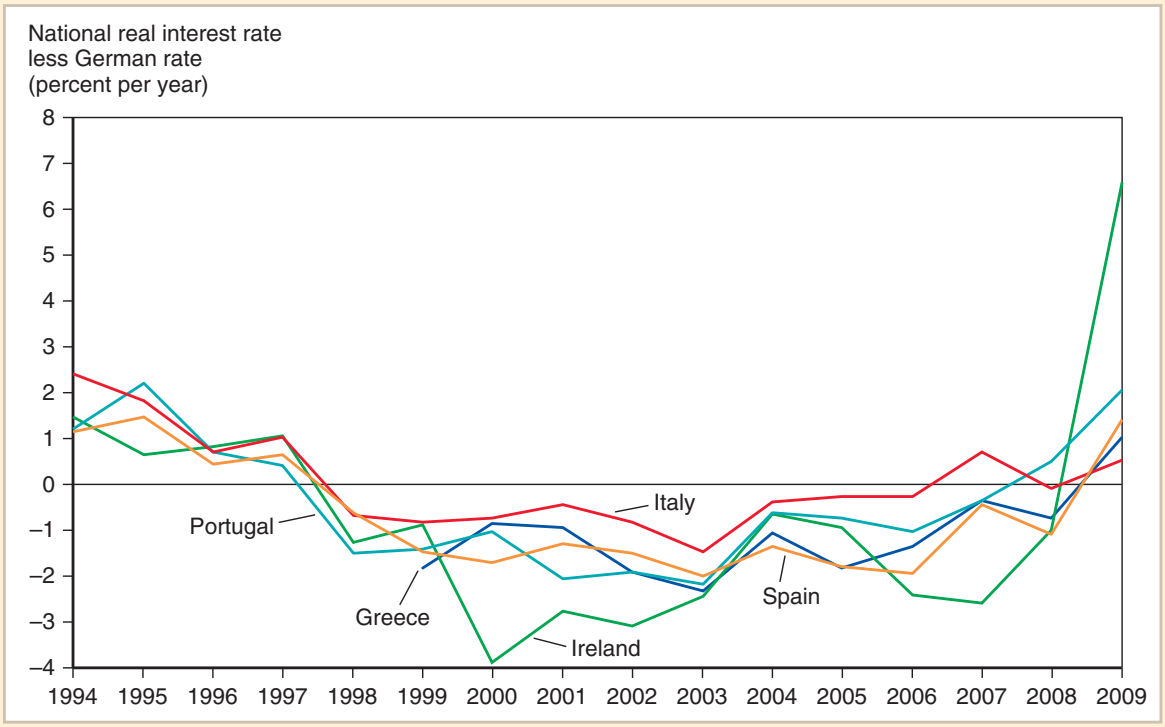


Figure 20-8

Divergent Real Interest Rates in the Euro Zone

As the 1999 launch date for the euro approached, nominal long-term bond rates in prospective member countries converged, leading to lower real interest rates in those countries with relatively high inflation. The graph shows each country's long-term real interest rate minus Germany's long-term real interest rate. Real interest rates are average nominal rates on ten-year government bonds minus the same year's inflation rate.

Source: Datastream.

inflation. Figure 20-8 shows how real interest rates fell relative to German rates from the mid-1990s, and generally remained low through the late 2000s.[17]

Second, of course, the *real* exchange rates of these countries appreciated relative to those of Germany even though the *nominal* exchange rate remained fixed at 1 due to the common currency. Current account deficits expanded, in some cases to staggeringly high levels, as Table 20-3 shows. By 2008, Greece had a deficit of 14.6 percent of its output, while Spain, a much larger country, was borrowing around 10 percent of its output from abroad. In contrast, Germany, which had worked hard in previous years to reduce manufacturing costs, was running a big surplus.

Why these divergences? The deficit countries of the euro zone are poorer than those of northeastern Europe but have been modernizing their economies over time, in some cases (such as Ireland's) making rapid progress in raising living standards. The Balassa-Samuelson theory (Chapter 16) suggests that if productivity was increasing in these

[17] This type of monetary instability was predicted by Sir Alan Walters, an economic adviser to Prime Minister Margaret Thatcher of Britain and a strong opponent of fixed exchange rates within Europe. See his polemical book *Sterling in Danger: Economic Consequences of Fixed Exchange Rates* (London: Fontana, 1990).

TABLE 20-3 Current Account Balances of Euro Zone Countries, 2005–2009 (percent of GDP)

	Greece	Ireland	Italy	Portugal	Spain	Germany
2005	−7.5	−3.5	−1.7	−9.4	−7.4	5.1
2006	−11.2	−4.1	−2.6	−9.9	−9.0	6.5
2007	−14.4	−5.3	−2.4	−9.4	−10.0	7.6
2008	−14.6	−5.3	−3.4	−12.0	−9.8	6.7
2009	−11.2	−2.9	−3.1	−10.3	−5.4	5.0

countries, inflation would naturally be higher than that in Germany, leading to real appreciation over time. However, rising manufacturing costs in the poorer countries suggest that this is only part of the story: A substantial portion of inflation was driven by buoyant aggregate demand rather than by Balassa-Samuelson productivity effects (which raise wages but not tradable-sector production costs). In addition, many of the deficit euro zone economies experienced housing booms similar to that of the United States (Chapter 19), while Germany did not. It is hard to see how a uniform monetary policy could be appropriate for countries in such diverse circumstances.

Other Considerations

While the *GG-LL* model is useful for organizing our thinking about optimum currency areas, it is not the whole story. At least two other elements affect our evaluation of the euro currency area's past and prospective performances.

Similarity of Economic Structure. The *GG-LL* model tells us that extensive trade with the rest of the euro zone makes it easier for a member to adjust to output market disturbances that affect it and its currency partners differently. But it does not tell us what factors will reduce the frequency and size of member-specific product market shocks.

A key element in minimizing such disturbances is similarity in economic structure, especially in the types of products produced. Euro zone countries are not entirely dissimilar in manufacturing structure, as evidenced by the very high volume of *intra-industry trade*—trade in similar products—within Europe (see Chapter 8). There are also important differences, however. The countries of northern Europe are better endowed with capital and skilled labor than the countries in Europe's south, and EU products that make intensive use of low-skill labor thus are likely to come from Portugal, Spain, Greece, or southern Italy. It is not yet clear whether completion of the single European market will remove these differences by redistributing capital and labor across Europe or increase them by encouraging regional specialization to exploit economies of scale in production.

Fiscal Federalism. Another consideration in evaluating the euro zone is the European Union's ability to transfer economic resources from members with healthy economies to those suffering economic setbacks. In the United States, for example, states faring poorly relative to the rest of the nation automatically receive support from Washington in the form of welfare benefits and other federal transfer payments that ultimately come out of the taxes other states pay. Such **fiscal federalism** can help offset the economic stability loss due to fixed exchange rates, as it does in the United States. Unfortunately, the European Union's limited taxation powers allow it to practice fiscal

federalism only on a very small scale. This is just fine with those voters in Europe who do not wish to pay higher taxes to support transfer payments to weaker countries within the euro zone.

Summing Up

How should we judge Europe in light of the theory of optimum currency areas? On balance, there is little evidence that Europe's product and factor markets are sufficiently unified yet to make it an optimum currency area. However, there *is* evidence that national financial markets have become better integrated with each other as a result of the euro, and that the euro has promoted intra-EU trade. But while capital moves with little interference, labor mobility is nowhere near the high level countries would need to adjust smoothly to product market disturbances through labor migration.

Because labor income makes up around two-thirds of GNP in the European Union and the hardships of unemployment are so severe, the low labor mobility between and within EU countries implies that the economic stability loss from euro zone membership could be high. Evidence that such losses may turn out to be costly indeed is provided by the persistently high unemployment rates in some euro zone countries (see Table 19-2). Furthermore, divergent economic performance under the uniform monetary policy of the ECB suggests that euro zone countries have been subject to asymmetric shocks.

The European Union's current combination of rapid capital migration with limited labor migration may actually *raise* the cost of adjusting to product market shocks without exchange rate changes. If the Netherlands suffers an unfavorable shift in output demand, for example, Dutch capital can flee abroad, leaving even more unemployed Dutch workers behind than if government regulations were to bottle the capital up within national borders. Severe and persistent regional depressions could result, worsened by the likelihood that the relatively few workers who do successfully emigrate would be precisely those who are most skilled, reliable, and enterprising. Given that labor remains relatively immobile within Europe, the European Union's success in liberalizing its capital flows may have worked perversely to worsen the economic stability loss due to the process of monetary unification. This possibility is another example of the *theory of the second best*, which implies that liberalization of one market (the capital market) can reduce the efficiency of EU economies if another market (the labor market) continues to function poorly.

The Future of EMU

Europe's single currency experiment is the boldest attempt ever to reap the efficiency gains from using a single currency over a large and diverse group of sovereign states. If EMU succeeds, it will promote European political as well as economic integration, fostering peace and prosperity in a region that could someday include all of Eastern Europe and even Turkey. If the euro project fails, however, its driving force, the goal of European political unification, will be set back.

What problems will EMU face in the coming years? There are several, some of which we have already discussed:

1. Europe is not an optimum currency area. Therefore, asymmetric economic developments within different countries of the euro zone—developments that might well call for different national interest rates under a regime of individual national currencies—will

be hard to handle through monetary policy. Even as the euro's launch was being prepared at the end of 1998, for example, Germany's economy was experiencing negative growth rates while those of Spain, Portugal, and Ireland were growing at healthy clips. Since the national governments within the EU until 1999 were accustomed to having sovereignty over national economic policies, such macroeconomic asymmetries can lead to regional political pressures on the ECB that are stronger than the ones that typically emerge in long-standing political unions such as the United States.

2. A related potential problem is that the single currency project has taken economic union to a level far beyond what the EU has been able (or willing) to do in the area of political union. European economic unification has a centralized power (the ECB) and a tangible expression in the euro; the political counterparts are much weaker. Many Europeans hope that economic union will lead to closer political union, but it is also possible that quarrels over economic policies will sabotage that aim. Furthermore, the lack of a strong EU political center may limit the ECB's political legitimacy in the eyes of the European public. There is a danger that voters throughout Europe will come to view the ECB as a distant and politically unaccountable group of technocrats who are unresponsive to people's needs.

3. In most of the larger EU countries, labor markets remain highly unionized and subject to employment taxes and regulations that impede labor mobility between industries and regions. The result has been persistently high levels of unemployment. Unless labor markets become much more flexible, as in the United States' currency union, individual euro zone countries will have a difficult time adjusting to economic shocks. Advocates of the euro have argued that the single currency, by removing the possibility of intra-EMU currency realignments, will impose discipline on workers' wage demands and speed the reallocation of labor within national economies. It is equally plausible, however, that workers in different euro zone countries will press for wage harmonization to reduce the high incentive that capital has to migrate to the EMU countries with the lowest wages.

4. It remains to be seen if the EU will develop more elaborate institutions for carrying out fiscal transfers from country to country within the euro zone. In the run-up to 1998, EU countries made heroic efforts to squeeze their government budget deficits to within the 3-percent-of-GDP limit set by the Maastricht Treaty. Some euro zone countries have run afoul of the SGP, however, because their apparent fiscal cuts in many cases involved one-time measures or "creative accounting"—and in some cases outright deception. These countries must carry out further fiscal restructuring to avoid increased government deficits, and possibly debt crises, in the future. But that task will prove daunting until robust economic growth returns to Europe, and in the meantime, efforts at fiscal consolidation will further depress euro zone growth. The European government debt crisis of 2010 showed the need for some sort of centralized European fiscal capacity to deal rapidly with inherently contagious member-country financial instability. But it also showed the strength of opposition in some countries to such an institution.

5. In the 2000s the EU carried out a large-scale expansion of its membership into Eastern Europe and the Mediterranean. That change raises numerous far-reaching challenges for the EU, but some of them have obvious implications for the EMU project. For example, the ESCB's governing council, where every euro zone member country has a representative and a vote, would become very unwieldy with twice as many national governors present. Agreement must be reached on some scheme of rotating representation, yet it is hard to imagine Germany, for example, ceding its seat, even temporarily, to a tiny country like Malta or Cyprus. As more countries enter the euro zone, the possibility of asymmetric economic shocks will rise, so countries may become less rather than more willing to delegate their votes to regional representatives.

The Euro Zone Debt Crisis of 2010

In the spring of 2010, world financial markets were shaken by a crisis that some felt had the potential to break up the euro zone. Surprisingly, the crisis originated in Greece, which accounts for only about 3 percent of the euro zone's output.

The crisis began when a new Greek government, headed by George Papandreou, was elected in October 2009. At the time, Greek unemployment was already high as a result of the global recession that had started late in 2007 and intensified in 2008. Papandreou's government announced more bad news: The government budget deficit stood at 12.7 percent of GDP, more than double the numbers announced by the previous government. Apparently the previous government had been misreporting its economic statistics for years, and the public debt actually amounted to more than 100 percent of GDP.

Holders of Greek bonds, including many banks within the euro zone, began to worry about the Greek government's ability to close its yawning deficit and repay its debts. In December 2009 the major rating agencies Fitch, Standard & Poor's, and Moody's all downgraded Greek government debt. (Investors look to these agencies to assess the probability that various debtors will actually repay.) As the figure shows, the Greek government's borrowing spread over German bonds rose to levels previously seen in late 2008 and early 2009, when global financial markets had been in turmoil over the fallout from the subprime crisis (as discussed more fully in the next chapter).

The Papandreou government announced harsh budget cuts and raised some taxes in the first months of 2010, but was soon faced with street protests and strikes. Further downgrades followed and Greek borrowing costs soared, making it even harder for the country to repay creditors. Investors began to worry that other deficit countries might face problems similar to those of Greece. The figure shows that borrowing costs for Portugal and Ireland, and even for two larger countries, Spain and Italy, came under pressure. The prospect of a much wider financial crisis in Europe grew, and world stock markets plunged.

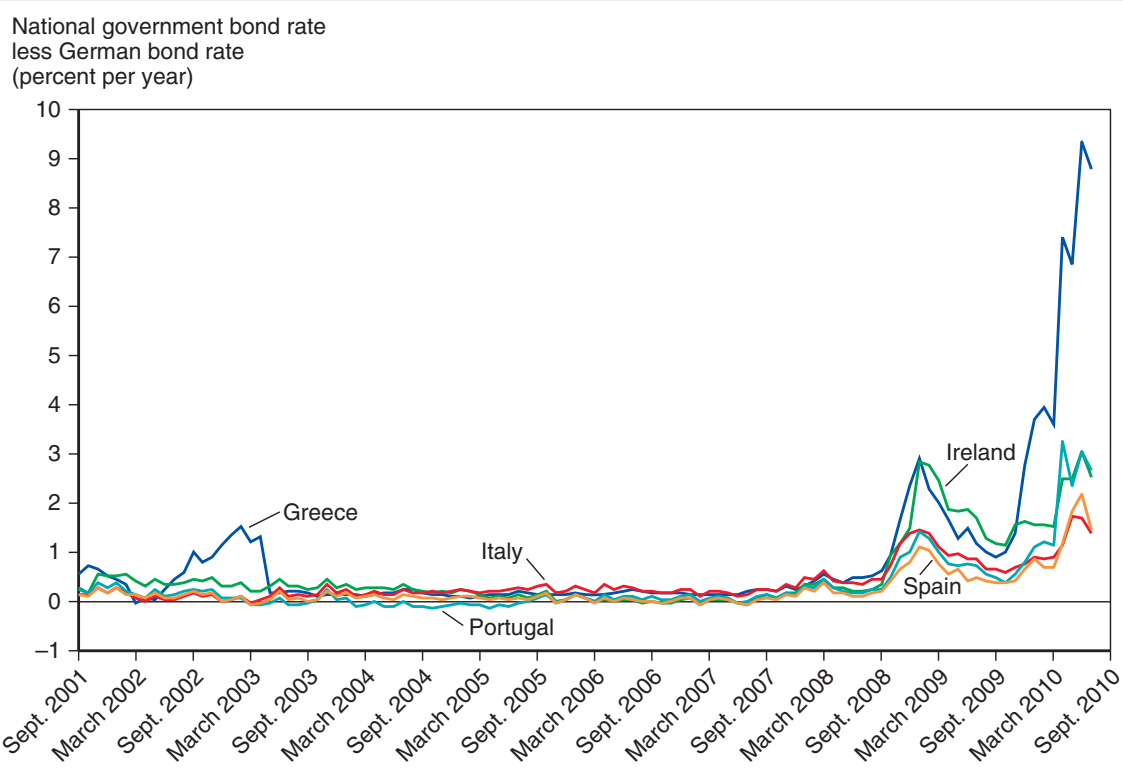
How did the EU deal with the crisis? A bailout of Greece by richer EU countries would have quelled the market turmoil, but that was exactly the outcome that countries like Germany had wished to avoid when they negotiated the Maastricht Treaty and the SGP. In mid-March 2010, euro zone finance ministers declared their intention to help Greece but provided no details of what they planned to do. With the EU unable to take concrete action, the crisis snowballed, and the value of the euro fell in the foreign exchange markets.

Finally, in mid-April, euro zone countries agreed on a loan package for Greece. Although German participation initially seemed uncertain, the euro zone countries, working with the IMF, agreed on a package that would give Greece €110 billion in much-needed loans.

But by this time, the panic over government debt had spread, and the Portuguese, Spanish, and Italian governments (following what Ireland had already undertaken late in 2008) were proposing their own deficit-reduction measures in an effort to keep borrowing spreads from rising to Greek levels. Fearing a continental meltdown, the euro zone's leaders embedded the Greek support within a broader *European Financial Stability Facility* (EFSF), with funding of €750 billion provided by its own borrowing from markets, the European Commission, and the IMF. The ECB then reversed a policy it had earlier announced and began to purchase the bonds of troubled euro zone debtor countries, sparking accusations that it was violating the spirit of the Maastricht Treaty by rewarding fiscal excesses. In fact, the ECB's motivation was to avoid a banking panic by supporting the prices of assets widely held by European banks.

The crisis did not abate quickly. Although Greece's government made more severe budget cuts than could have been expected in the spring of 2010, its borrowing costs remained high. Then Ireland's market borrowing rates rose sharply as the government's cost of supporting shaky Irish banks rose. Late in 2010, Ireland negotiated a €67.5 billion EFSF loan package, and worries ran high that Portugal and perhaps even Spain might be next.

The crisis showed how difficult it is to respond to a financial panic when there is no central institution with fiscal resources that can act decisively and quickly. At the same time, the crisis displayed the considerable political opposition in some of the wealthier euro zone countries, notably Germany, to such an institution. Therefore, at the same time the euro countries have set up the EFSF, they have also discussed the possibility of tighter supervision of national deficits, with more drastic sanctions on countries that borrow too much. The German finance minister, Wolfgang Schäuble, even suggested that repeat offenders be expelled from the euro zone! The possibility of expulsion—or even voluntary departure—from the euro zone is fraught with legal difficulties and had not been seriously discussed prior to the debt crisis of 2010. But as we have seen, the economic and political fissures that the crisis revealed have been present from the euro project's start.



Average Government Nominal Borrowing Spreads over Germany

Greek government borrowing costs soared in 2010. At the same time, markets placed upward pressure on the borrowing costs of other countries with big deficits.

Source: Bank of America/Merrill Lynch index of average spreads, from Datastream.

Thus, the euro faces significant challenges in the years ahead. The experience of the United States shows that a large monetary union comprising diverse economic regions can work quite well. For the euro zone to achieve comparable economic success, however, it will have to make progress in creating a flexible EU-wide labor market, in reforming its fiscal systems, and in deepening its political union. European unification itself will be imperiled unless the euro project and its defining institution, the ECB, succeed in delivering prosperity as well as price stability.

SUMMARY

1. European Union countries have had two main reasons for favoring mutually fixed exchange rates: They believe monetary cooperation will give them a heavier weight in international economic negotiations, and they view fixed exchange rates as a complement to EU initiatives aimed at building a common European market.
2. The *European Monetary System* of fixed intra-EU exchange rates was inaugurated in March 1979 and originally included Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, and the Netherlands. Austria, Britain, Portugal, and Spain joined much later. Capital controls and frequent realignments were essential ingredients in maintaining the system until the mid-1980s, but since then, controls have been abolished as part of the European Union's wider program of market unification. During the currency crisis that broke out in September 1992, Britain and Italy allowed their currencies to float. In August 1993, most EMS currency bands were widened to ± 15 percent in the face of continuing speculative attacks.
3. In practice, all EMS currencies were pegged to Germany's former currency, the deutsche mark (DM). As a result, Germany was able to set monetary policy for the EMS, just as the United States did in the Bretton Woods system. The *credibility theory of the EMS* holds that participating governments profited from the German Bundesbank's reputation as an inflation fighter. In fact, inflation rates in EMS countries ultimately tended to converge around Germany's generally low inflation rate.
4. On January 1, 1999, 11 EU countries initiated an *economic and monetary union (EMU)* by adopting a common currency, the euro, issued by a European System of Central Banks (ESCB). (The initial 11 members were joined by several other countries later on.) The ESCB consists of EU members' national central banks and a European Central Bank, headquartered in Frankfurt, whose governing council runs monetary policy in EMU. The transition process from the EMS's fixed exchange rate system to EMU was spelled out in the *Maastricht Treaty* signed by European leaders in December 1991.
5. The Maastricht Treaty specified a set of macroeconomic convergence criteria that EU countries would need to satisfy in order to qualify for admission to EMU. A major purpose of the convergence criteria was to reassure voters in low-inflation countries such as Germany that the new, jointly managed European currency would be as resistant to inflation as the DM had been. A *Stability and Growth Pact (SGP)*, devised by EU leaders in 1997 at Germany's insistence, had the potential to restrict the flexibility of EMU members to carry out fiscal policy at the national level. The SGP and EMU together might therefore have deprived individual countries in the euro zone of national fiscal as well as monetary policy, but the SGP has not been enforced in practice, and was weakened in 2005.
6. The theory of *optimum currency areas* implies that countries will wish to join fixed exchange rate areas closely linked to their own economies through trade and factor

mobility. A country's decision to join an exchange rate area is determined by the difference between the *monetary efficiency gain* from joining and the *economic stability loss* from joining. The *GG-LL* diagram relates both of these factors to the degree of economic integration between the joining country and the larger, fixed exchange rate zone. Only when economic integration passes a critical level is it beneficial to join.

7. The European Union does not appear to satisfy all of the criteria for an optimum currency area. Although many barriers to market integration within the European Union have been removed since the 1980s and the euro appears to have promoted intra-EU trade, the level of trade still is not very extensive. In addition, labor mobility between and even within EU countries appears more limited than that within other large currency areas such as the United States. These factors have hampered adjustment to the asymmetric shocks that have occurred. Finally, the level of *fiscal federalism* in the European Union is too small to cushion member countries from adverse economic events.

KEY TERMS

credibility theory of the EMS, p. 561
economic and monetary union (EMU), p. 563
economic stability loss, p. 568
European Monetary System (EMS), p. 560
fiscal federalism, p. 577
Maastricht Treaty, p. 563
monetary efficiency gain, p. 567
optimum currency areas, p. 566
Stability and Growth Pact (SGP), p. 564

PROBLEMS

1. Why might EMS provisions for the extension of central bank credits from strong- to weak-currency members have increased the stability of EMS exchange rates?
2. In the EMS before September 1992, the Italian lira/DM exchange rate could fluctuate by up to 2.25 percent up *or* down. Assume that the lira/DM central parity and band were set in this way and could not be changed. What would have been the maximum possible difference between the interest rates on *one-year* lira and DM deposits? What would have been the maximum possible difference between the interest rates on *six-month* lira and DM deposits? On *three-month* deposits? Do the answers surprise you? Give an intuitive explanation.
3. Continue with the last question. Imagine that in Italy, the interest rate on five-year government bonds was 11 percent per annum and that in Germany, the rate on five-year government bonds was 8 percent per annum. What would have been the implications for the credibility of the current lira/DM exchange parity?
4. Do your answers to the last two questions require an assumption that interest rates and expected exchange rate changes are linked by interest parity? Why or why not?
5. Suppose that soon after Norway pegs to the euro, EMU benefits from a favorable shift in the world demand for non-Norwegian EMU exports. What happens to the exchange rate of the Norwegian krone against noneuro currencies? How is Norway affected? How does the size of this effect depend on the volume of trade between Norway and the euro zone economies?
6. Use the *GG-LL* diagram to show how an increase in the size and frequency of unexpected shifts in a country's money demand function affects the level of economic integration with a currency area at which the country will wish to join.