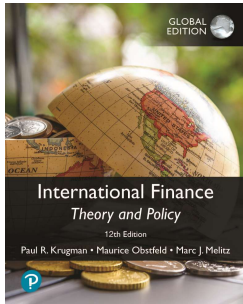


International Finance: Theory & Policy, 12/e, Global Edition



Chapter 10

Optimum Currency Areas and the Euro

Learning Objectives (1 of 2)

10.1 Discuss why Europeans have long sought to stabilize their mutual exchange rates while floating against the U.S. dollar.

10.2 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 Central Bank (ECB).

10.3 Detail the structure of the ECB, the European System of Central Banks, and the European Union's arrangements for coordinating member states' economic policies.

Learning Objectives (2 of 2)

10.4 Articulate the main lessons of the theory of optimum currency areas.

10.5 Recount how the 19 countries using the euro have fared so far in their currency union, and the steps they are taking in response to their prolonged economic crisis.

Preview

- The European Union
- The European Monetary System
- Policies of the EU and the EMS
- Theory of optimal currency areas
- Is the EU an optimal currency area?
- Other considerations of an economic and monetary union

What Is the EU?

- The European Union is a system of international institutions, the first of which originated in 1957, which now represents 27 European countries through the following bodies:
 - **European Parliament:** elected by citizens of member countries
 - **Council of the European Union:** appointed by governments of the member countries
 - **European Commission:** executive body
 - **Court of Justice:** interprets EU law
 - **European Central Bank,** which conducts monetary policy through a system of member country banks called the **European System of Central Banks**

What Is the EMS?

- The **European Monetary System** was originally a system of fixed exchange rates implemented in 1979 through an **exchange rate mechanism** (ERM).
- The EMS has since developed into an **economic and monetary union** (EMU), a more extensive system of coordinated economic and monetary policies.
 - The EMS has replaced the exchange rate mechanism for most members with a common currency under the economic and monetary union.

Membership of the Economic and Monetary Union

- To be part of the economic and monetary union, EMS members must
 1. adhere to the ERM: exchange rates were fixed in specified bands around a target exchange rate.
 2. follow restrained fiscal and monetary policies as determined by Council of the European Union and the European Central Bank.
 3. replace the national currency with the euro, whose circulation is determined by the European System of Central Banks.

Membership of the EU

- To be a member of the EU, a country must, among other things,
 1. have low barriers that limit trade and flows of financial assets
 2. adopt common rules for emigration and immigration to ease the movement of people
 3. establish common workplace safety and consumer protection rules
 4. establish certain political and legal institutions that are consistent with the E U's definition of liberal democracy.

Figure 10.1 Members of the Euro Zone as of January 1, 2021

The heavily shaded countries on the map are the 19 members of EMU: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, the Slovak Republic, Slovenia, and Spain. The United Kingdom never adopted the euro, and it left the EU in 2020 owing to the exit referendum of June 2016.



Table 10.1 A Brief Glossary of Euronyms

ECB	European Central Bank
EEA	European Economic Area
EFSSF	European Financial Stability Facility
EMS	European Monetary System
EMU	Economic and Monetary Union
ERM	Exchange Rate Mechanism
ESCB	European System of Central Banks
ESM	European Stability Mechanism
EU	European Union
OMT	Outright Monetary Transactions
SGP	Stability and Growth Pact
SRM	Single Resolution Mechanism
SSM	Single Supervisory Mechanism

Why the EU?

- Countries that established the EU and EMS had several goals
 1. To enhance Europe's **power in international affairs**: as a union of countries, the EU could represent more economic and political power in the world.
 2. To make Europe a **unified market**: a large market with free trade, free flows of financial assets, and free migration of people—in addition to fixed exchange rates or a common currency—was believed to foster economic growth and economic well-being.
 3. To make Europe **politically stable and peaceful**.

Why the Euro (EMU)?

EU members adopted the euro for four main reasons:

1. **Unified market**: the belief that greater market integration and economic growth would occur.
2. **Political stability**: the belief that a common currency would make political interests more uniform.
3. **The belief that German influence** under the EMS **would be moderated** under a European System of Central Banks.
4. **Elimination of the possibility of devaluations/ revaluations**: with free flows of financial assets, capital flight and speculation could occur in an EMS with separate currencies, but it would be more difficult for them to occur in an EMS with a single currency.

The EMS: 1979–1998 (1 of 4)

- From 1979 to 1993, the EMS defined the exchange rate mechanism to allow most currencies to fluctuate $\pm 2.25\%$ around target exchange rates.
- The exchange rate mechanism allowed larger fluctuations ($\pm 6\%$) for currencies of Portugal, Spain, Britain (until 1992), and Italy (until 1990).
 - These countries wanted greater flexibility with monetary policy.
 - The wider bands were also intended to prevent speculation caused by differing monetary and fiscal policies.

The EMS: 1979–1998 (2 of 4)

To prevent speculation,

- early in the EMS some **exchange controls** were also enforced to limit trading of currencies.
 - But from 1987 to 1990 these controls were lifted in order to make the EU a common market for financial assets.
- A **credit system** was also developed among EMS members to lend to countries that needed assets and currencies that were in high demand in the foreign exchange markets.

The EMS: 1979–1998 (3 of 4)

- But because of differences in monetary and fiscal policies across the EMS, market participants began buying German assets (because of high German interest rates) and selling other EMS assets.
- As a result, Britain left the EMS in 1992 and allowed the pound to float against other European currencies.
- As a result, the exchange rate mechanism was redefined in 1993 to allow for bands of $\pm 15\%$ of the target value in order to devalue many currencies relative to the deutschmark.

The EMS: 1979–1998 (4 of 4)

- But eventually, each EMS member adopted similarly restrained fiscal and monetary policies, and the inflation rates in the EMS eventually converged (and speculation slowed or stopped).
 - In effect, EMS members were following the restrained monetary policies of Germany, which has traditionally had low inflation.
 - Under the EMS exchange rate mechanism of fixed bands, Germany was “exporting” its monetary policy.

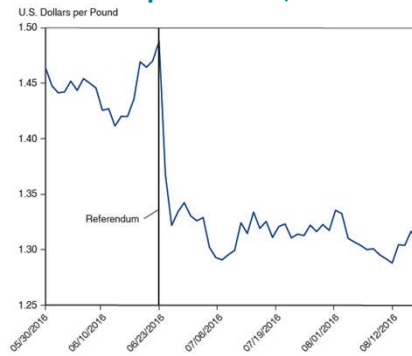
Brexit (1 of 2)

- On June 23, 2016, British citizens voted to leave the EU.
 - Britain had never adopted the euro.
- Stock markets across the world tumbled, and the pound sterling plummeted.
- Voters want to limit immigration from Eastern Europe, and the benefits, such as medical care, the UK government must provide immigrants under EU law.
 - Desire to “Take Back Control” from EU regulations in many dimensions.
- Britain had to negotiate trade deals with every country.

Brexit (2 of 2)

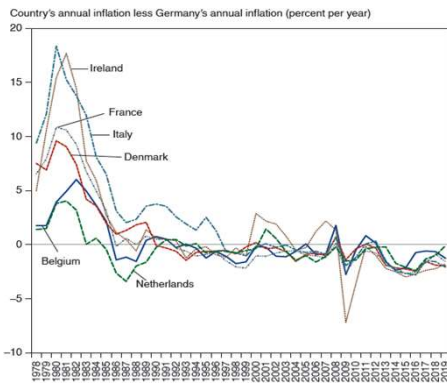
- Under 2019 withdrawal agreement bill, Brexit took place January 31, 2020 with an 11-month transition period during which Britain continued to follow EU rules and kept frictionless trade with other EU countries.
 - Added time to negotiate permanent trade agreements.
 - A last minute deal achieved mostly tariff and quota-free trade between Britain and the EU.
 - To keep boundary between Northern Ireland (part of United Kingdom) and the Republic of Ireland free of border controls led to Northern Ireland still partially in the EU single market and administrative checks on imports.

U.S. Dollars per Pound, 05/2016-08/2018



Source: Global financial data.

Figure 10.2 Inflation Convergence for Six Original EMS Members, 1978–2019



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, and BLS.

Policies of the EU and EMS (1 of 4)

- The **Single European Act of 1986** recommended that many barriers to trade, financial asset flows, and immigration be removed by December 1992.
 - It also allowed EU policy to be approved with less than unanimous consent among members.
- The **Maastricht Treaty**, proposed in 1991, required the three provisions to transform the EMS into an economic and monetary union.
 - It also required standardizing regulations and centralizing foreign and defense policies among EU countries.
 - Some EU/EMS members have not ratified all of the clauses.

Policies of the EU and EMS (2 of 4)

- The Maastricht Treaty requires that members that want to **enter** the economic and monetary union
- 1. attain exchange rate stability defined by the ERM before adopting the euro.
- 2. attain price stability: a maximum inflation rate of 1.5% above the average of the three lowest national inflation rates among EU members.
- 3. maintain a restrictive fiscal policy:
 - a maximum ratio of government deficit to GDP of 3%.
 - a maximum ratio of government debt to GDP of 60%.

Policies of the EU and EMS (3 of 4)

- The Maastricht Treaty requires that members that want to **remain** in the economic and monetary union
- 1. maintain a restrictive fiscal policy:
 - a maximum ratio of government deficit to GDP of 3%.
 - a maximum ratio of government debt to GDP of 60%.
 - Financial penalties are imposed on countries with "excessive" deficits or debt.
- The **Stability and Growth Pact**, negotiated in 1997, also allows for financial penalties on countries with "excessive" deficits or debt.

Policies of the EU and EMS (4 of 4)

- The euro was adopted in 1999, and the previous exchange rate mechanism became obsolete.
- But a new exchange rate mechanism—ERM 2—was established between the economic and monetary union and outside countries.
 - It allowed countries (either within or outside the EU) that wanted to enter the economic and monetary union in the future to maintain stable exchange rates before doing so.
 - It allowed EU members outside of the economic and monetary union to maintain fixed exchange rates if desired.

Theory of Optimum Currency Areas (1 of 12)

- The theory of **optimum currency areas** argues that the optimal area for a system of fixed exchange rates, or a common currency, is one that is **highly economically integrated**.
 - economic integration means free flows of
 - goods and services (trade)
 - financial capital (assets) and physical capital
 - workers/labor (immigration and emigration)
- The theory was developed by Robert Mundell in 1961.

Theory of Optimum Currency Areas (2 of 12)

- Fixed exchange rates have costs and benefits for countries deciding whether to adhere to them.
- Benefits of fixed exchange rates are that they avoid the uncertainty and international transaction costs that floating exchange rates involve.
- The gain that would occur if a country joined a fixed exchange rate system is called the **monetary efficiency gain**.

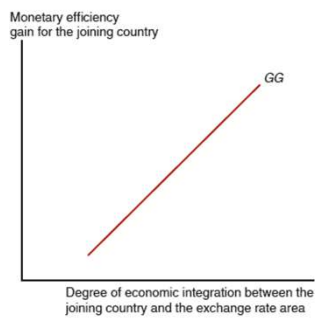
Theory of Optimum Currency Areas (3 of 12)

- The monetary efficiency gain of joining a fixed exchange rate system depends on the amount of economic integration.
- Joining fixed exchange rate system would be beneficial for a country if
 1. trade is extensive between it and member countries, because transaction costs would be greatly reduced.
 2. financial assets flow freely between it and member countries, because the uncertainty about rates of return would be greatly reduced.
 3. people migrate freely between it and member countries, because the uncertainty about the purchasing power of wages would be greatly reduced.

Theory of Optimum Currency Areas (4 of 12)

- In general, as the degree of economic integration increases, the monetary efficiency gain increases.
- Draw a graph of the monetary efficiency gain as a function of the degree of economic integration.

Figure 10.3 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.

Theory of Optimum Currency Areas (5 of 12)

When considering the monetary efficiency gain,

- we have assumed that the members of the fixed exchange rate system would maintain stable prices.
 - But when variable inflation exists among member countries, then joining the system would not reduce uncertainty (as much).
- we have assumed that a new member would be fully committed to a fixed exchange rate system.
 - But if a new member is likely to leave the fixed exchange rate system, then joining the system would not reduce uncertainty (as much).

Theory of Optimum Currency Areas (6 of 12)

- Economic integration also allows prices to converge between members of a fixed exchange rate system and a potential member.
 - The law of one price is expected to hold better when markets are integrated.

Theory of Optimum Currency Areas (7 of 12)

- Costs of fixed exchange rates are that they require the loss of monetary policy for stabilizing output and employment, and the loss of automatic adjustment of exchange rates to changes in aggregate demand.
- Define this loss that would occur if a country joined a fixed exchange rate system as the **economic stability loss**.

Theory of Optimum Currency Areas (8 of 12)

- The economic stability loss of joining a fixed exchange rate system also depends on the amount of economic integration.
- After joining a fixed exchange rate system, if the new member faces a fall in aggregate demand:
 1. Relative prices will tend to fall, which will lead other members to increase aggregate demand greatly if economic integration is extensive, so that the economic loss is not as great.
 2. Financial assets or labor will migrate to areas with higher returns or wages if economic integration is extensive, so that the economic loss is not as great.

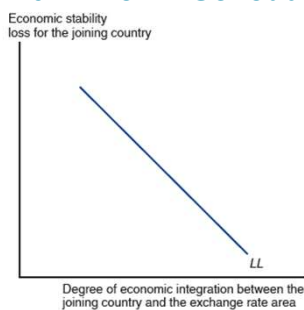
Theory of Optimum Currency Areas (9 of 12)

3. The loss of the automatic adjustment of flexible exchange rates is not as great if goods and services markets are integrated. Why?
- Consider what would have happened if the country did not join the fixed exchange rate system:
 - the automatic adjustment would have caused a depreciation of the domestic currency and an appreciation of foreign currencies, which would have caused an increase in many prices for domestic consumers when goods and services markets are integrated.

Theory of Optimum Currency Areas (10 of 12)

- In general, as the degree of economic integration increases, the economic stability loss decreases.
- Draw a graph of the economic stability loss as a function of the degree of economic integration.

Figure 10.4 The LL Schedule

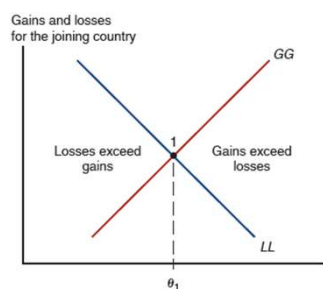


The downward-sloping LL schedule shows that a country's economic stability loss from joining a fixed exchange rate area falls as the country's economic integration with the area rises.

Theory of Optimum Currency Areas (11 of 12)

- At some critical point measuring the degree of integration, the monetary efficiency gain will exceed the economic stability loss for a member considering whether to join a fixed exchange rate system.

Figure 10.5
Deciding When to Peg the Exchange Rate

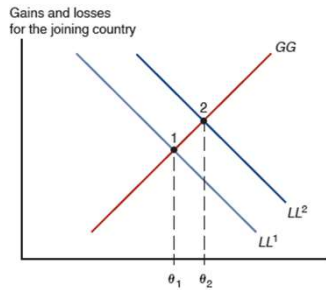


The intersection of GG and LL at point 1 determines a critical level of economic integration, θ_1 , between a fixed exchange rate area and a country considering whether to join. At any level of integration above θ_1 , the decision to join yields positive net economic benefits to the joining country.

Theory of Optimum Currency Areas (12 of 12)

- There could be an event that causes the frequency or magnitude of changes in aggregate demand to increase for a country.
- If so, the economic stability loss would be greater for every measure of economic integration between a new member and members of a fixed exchange rate system.
- How would this affect the critical point where the monetary efficiency gain equals economic stability loss?

Figure 10.6 An Increase in Output Market Variability

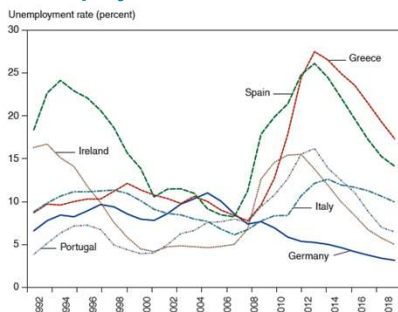


A rise in the size and frequency of country-specific disturbances to the joining country's product markets shifts the LL schedule upward from LL^1 to LL^2 because for a given level of economic integration with the fixed exchange rate area, the country's economic stability loss from pegging its exchange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

Is the EU an Optimum Currency Area? (1 of 4)

- If the EU/EMS/economic and monetary union can be expected to benefit members, we expect that its members have a high degree of economic integration:
 - large trade volumes as a fraction of GDP
 - a large amount of foreign financial investment and foreign direct investment relative to total investment
 - a large amount of migration across borders as a fraction of total labor force

Figure 10.7 Unemployment Rates in Selected EU Countries



Widely divergent unemployment rates moved closer together after the euro's launch in 1999 but since the late 2000s have moved sharply apart again.

Source: International Monetary Fund, **World Economic Outlook** database, April 2020. Numbers for 2020 are IMF forecasts.

Is the EU an Optimum Currency Area? (2 of 4)

- Deviations from the law of one price also occur in many EU markets.
 - If EU markets were greatly integrated, then the (currency-adjusted) prices of goods and services should be nearly the same across markets.
 - The price of the same BMW car varies 29.5% between British and Dutch markets.

Is the EU an Optimum Currency Area? (3 of 4)

- Regional migration is not extensive in the EU.
- Europe has many languages and cultures, which hinder migration and labor mobility.
- Unions and regulations also impede labor movements between industries and countries.
- Differences of U.S. unemployment rates across regions are smaller and less persistent than differences of national unemployment rates in the EU, indicating a lack of EU labor mobility.

Table 10.2 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

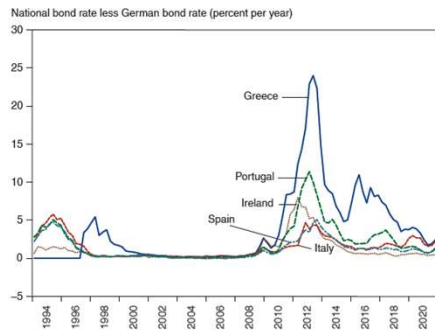
Sources: Peter Huber, "Inter-regional Mobility in Europe: A Note on the Cross-Country Evidence," *Applied Economics Letters* 11 (August 2004), pp. 619–624; and "Geographical Mobility, 2003–2004," U.S. Department of Commerce, March 2004. Table data are for Britain in 1996, Germany in 1990, Italy in 1999,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

Table 10.3 Assets of Some Individual Banks as a Ratio to National Output, End-2011

Bank	Home country	Bank assets
Erste Group Bank	Austria	0.68
Dexia	Belgium	1.10
BNP Paribas	France	0.97
Deutsche Bank	Germany	0.82
Bank of Ireland	Ireland	0.95
UniCredit	Italy	0.59
ING Group	Netherlands	2.12
Banco Commercial Portugues	Portugal	0.57
Banco Santander	Spain	1.19

Source: GDP data from International Monetary Fund, **World Economic Outlook** database. Data on bank assets from Viral V. Acharya and Sascha Steffen, "The 'Greatest' Carry Trade Ever? Understanding Eurozone Bank Risks," Discussion Paper 9432, Centre for Economic Policy Research, April 2013.

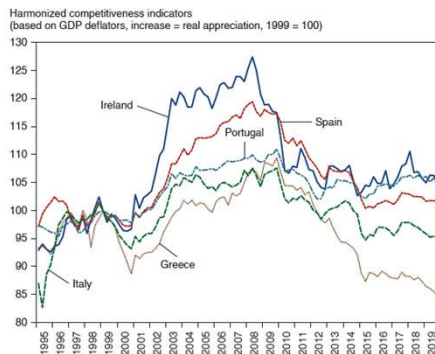
Figure 10.8
Nominal Government Borrowing Spreads Over Germany



Euro countries' long-term government bond yields converged to Germany's level as they prepared to join the euro. The yields began to diverge again with the global financial crisis of 2007–2009 and moved sharply apart after the euro crisis broke out late in 2009.

Source: Federal Reserve Economic Data (FRED), 10-year government bond yields.

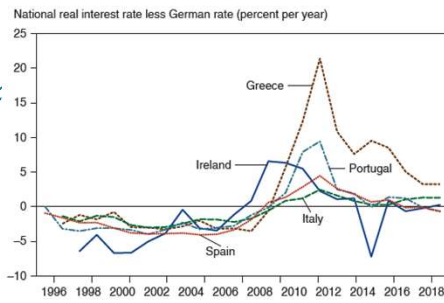
Figure 10.9
Real Appreciation in Peripheral Euro Zone Countries



After entry into the euro, real appreciation set in for peripheral euro zone countries, most noticeably the two with massive housing booms, Ireland and Spain.

Source: ECB. Harmonized multilateral competitiveness index based on GDP deflators. An increase in the index is a real appreciation (loss in competitiveness).

Figure 10.10
Divergent Real Interest Rates in the Euro Zone



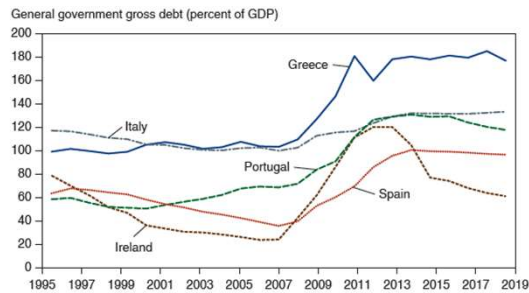
As the 1999 launch date for the euro approached, nominal long-term bond rates in prospective member countries converged, leading to lower real interest rates in those countries with relatively high inflation. The graph shows each country's long-term real interest rate minus Germany's long-term real interest rate. Real interest rates are average nominal rates on 10-year government bonds minus the same year's inflation rate.

Source: Federal Reserve Economic Data (FRED). Long-term government bond yields (10-year maturity, not seasonally adjusted, and GDP implicit price deflator index (2015 = 100).

Table 10.4 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	-2.6	-12.0	-9.8	6.7
2009	-11.2	-2.9	-3.1	-10.3	-5.4	5.0

Figure 10.11 Gross Public Debt to GDP Ratios in the Euro Area



Public debts in the euro area grew rapidly after 2007, in part due to the need for governments to support their weak banks.

Source: International Monetary Fund, **World Economic Outlook** database, October 2019.

Is the EU an Optimum Currency Area? (4 of 4)

- There is evidence that financial assets were able to move more freely within the EU after 1992 and 1999.
- But capital mobility without labor mobility can make the economic stability loss greater.
 - After a reduction of aggregate demand in a particular EU country, financial assets could be easily transferred elsewhere while labor is stuck.
 - The loss of financial assets could further reduce production and employment.

Other Considerations for an EMU (1 of 3)

- The **structure of the economies** in the EU's economic and monetary union is important for determining how members respond to aggregate demand shocks.
 - The economies of EU members are similar in the sense that there is a high volume of **intra-industry trade** relative to the total volume.
 - They are different in the sense that Northern European countries have **high levels of physical capital per worker and more skilled labor**, compared with Southern European countries.

Other Considerations for an EMU (2 of 3)

- How an EU member responds to aggregate demand shocks may depend on how the structure of its economy compares to that of fellow EU members.
- For example, the effects on an EU member of a reduction in aggregate demand caused by a reduction in demand in the software industry will depend on whether the EU member has a large number of workers skilled in programming relative to fellow EU members.

Other Considerations for an EMU (3 of 3)

- The **amount of transfers** among the EU members may also affect how EU economies respond to aggregate demand shocks.
 - Fiscal payments between countries in the EU's federal system, or **fiscal federalism**, may help offset the economic stability loss from joining an economic and monetary union.
 - But relative to interregional transfers in the United States, little fiscal federalism occurs among EU members.

The Future of EMU (1 of 2)

- EMU must overcome some difficult challenges, however, if it is to survive its current crisis and prosper.
 - 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 remain hard to handle through monetary policy.

The Future of EMU (2 of 2)

- In most 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, individual euro zone countries will have a hard time adjusting toward full employment and competitive real exchange rates. Other structural problems also abound.
- Thus, the euro faces significant challenges in the years ahead.

Summary (1 of 3)

1. The EMS was first a system of fixed exchange rates but later developed into a more extensive coordination of economic and monetary policies: an economic and monetary union.
2. The Single European Act of 1986 recommended that EU members remove barriers to trade, capital flows, and immigration by the end of 1992.
3. The Maastricht Treaty outlined three requirements for the EMU to become an economic and monetary union.
 - It also standardized many regulations and gave the EU institutions more control over defense policies.
 - It also set up penalties for spendthrift EMU members.

Summary (2 of 3)

4. A new exchange rate mechanism was defined in 1999 vis-à-vis the euro, when the euro came into existence.
5. An optimum currency area is a union of countries with a high degree of economic integration among goods and services, financial assets, and labor markets.
 - It is an area where the monetary efficiency gain of joining a fixed exchange rate system is at least as large as the economic stability loss.

Summary (3 of 3)

6. The EU does not have a large degree of labor mobility due to differences in culture and due to unionization and regulation.
7. The EU is not an optimum currency area.
