Decision Time for European Monetary Union

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TRAVELERS IN THE UNITED STATES TAKE FOR GRANTED THEIR ABILITY TO USE THE SAME DOLLAR BILLS TO PAY FOR MEALS, TAXIS, AND OTHER GOODS AND SERVICES THROUGHOUT THE NATION WHETHER THEY ARE IN NEW YORK, LOS ANGELES, OR ANYPLACE IN BETWEEN. HOWEVER, IN EUROPE THE SITUATION IS QUITE DIFFERENT. EVEN FAIRLY SHORT TRIPS OFTEN INVOLVE TRAVELING THROUGH MORE THAN ONE COUNTRY, AND, EACH TIME A BORDER IS CROSSED, TRAVELERS MUST USE COMPLETELY DIFFERENT CURRENCY AND COINS.

This situation may change dramatically in the next few years. If the plans of European governments for economic and monetary union (EMU) are realized, within five years a new common currency called the euro will replace the money currently in use in at least a few western European countries. A traveler going to Paris, Amsterdam, Berlin, and Rome might be able to use euros in all four places.

Even earlier, starting in 1999, a new European Central Bank is slated to take control of monetary policy in the initial member countries. At that time, exchange rates between the initial members will be fixed permanently. Eventually, in two or three decades, the euro may be in use throughout most of western and central Europe, from Ireland to Greece and from Portugal to Finland.

The choice of initial members in the monetary union is scheduled to be made early in 1998, but as of this writing major hurdles remain that could delay or possibly kill the whole plan. The biggest stumbling block involves budget deficits. To be eligible to join the proposed monetary union, countries are supposed to have budget deficits of no more than 3 percent of gross domestic product (GDP) in 1997, but it now appears likely that many prospective members, including the largest, Germany, will violate that limit.

This article examines the economic and political factors that will determine whether monetary union proceeds on schedule and, if so, which countries will be initial members. The first section provides background and lays out the current official timetable for monetary union. The second section reviews the convergence criteria to be used in determining which countries are ready to join, with special emphasis on the fiscal or budget deficit criterion that is proving to be the biggest problem.

Because so many countries are in danger of failing to satisfy all the convergence criteria, the third section describes several quite different scenarios that even at this late date are still under consideration, especially in

unofficial forums. The final decision on EMU will be made through political bargaining among the leaders of the prospective member countries. The next section outlines the results of economic models of such a bargaining process.

The prospect of monetary union is already affecting financial markets. The final part of the discussion shows how financial market data can be used to try to infer the market's assessment of the likelihood that certain countries will enter monetary union. Such estimates are no doubt imprecise, but as of early 1997 the pattern of market interest rates appeared to embody a substantial likelihood that a widespread monetary union will begin operation in the next few years.

Current Timetable for Monetary Union

At the beginning of 1999, Europe is scheduled to begin a major experiment in monetary arrangements. The Maastricht Treaty, which was signed by the members of the European Union (EU) in 1991, provides for economic and monetary union and creation of a European central bank by the end of this decade.[1] In many respects this undertaking is highly unusual; we are accustomed to thinking of each nation as having its own government, its own money, and its own central bank, which is either directly or indirectly a part of the government. The Maastricht framework would create both a new money that would be legal tender in all participating countries and a central bank that would not be an agency of any one government.

The Maastricht Treaty specified that monetary union between those countries that were ready would begin on January 1, 1999.[2] On that date the new European Central Bank would begin carrying out monetary policy in the uniting countries, and exchange rates between their individual currencies would be fixed permanently.

The countries that joined the monetary union initially would continue to use their national currencies for a time, but their bilateral exchange rates would be fixed irrevocably and their monetary policy would be set by the new European Central Bank, which is modeled on the German Bundesbank and is supposed to carry out monetary policy with the aim of ensuring price stability. By January 2002, notes and coins denominated in the new monetary unit, the euro, would be put into circulation, and after a short time the old national currencies and coins would be withdrawn from circulation. At that point, the euro would be the single currency in circulation throughout the monetary union.

The Maastricht Treaty was not approved merely to make life easier for travelers. To some extent monetary union was just one part of a more general move toward closer economic integration of the EU that also included the Single European Act or Europe 1992, which called for the elimination of many regulatory barriers to the free flow of goods, capital, and workers within the EU. European leaders hoped that greater economic integration would help rejuvenate their economies, many of which were plagued by high unemployment. Moreover, a larger, more integrated Europe would, it was hoped, benefit from economies of scale and be able to compete more effectively against economic rivals such as the United States and Japan.

The decision to dismantle restrictions on capital flows gave particular impetus to monetary union because free movement of capital is incompatible with fixed (or managed) exchange rate systems such as the European Monetary System

Many preparatory steps have been taken, but a number of key decisions, notably about which countries will be part of the union at its beginning, still remain to be made.

(EMS) and national autonomy in the formation and implementation of monetary policy (see Padoa-Schioppa 1994). When the proposals that became the Maastricht Treaty were under discussion in the late 1980s and early 1990s, the exchange rates of many of the European countries were already linked in the EMS. Fluctuations of each member's exchange rate relative to other members were limited to ranges defined by fairly narrow target bands. If one country—for example, Belgium—tried to exercise national autonomy in its monetary policy by lowering its interest rates significantly below those of other members, capital outflows could become so large that they would push Belgium's exchange rates to, if not beyond, the limits of the target bands. Free movement of capital would make the exchange rate target bands even harder to maintain. To proponents of monetary union (for example, Sutherland 1997), Europe would need to move ahead to monetary

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1. *When the Maastricht Treaty was signed, the EU had twelve members: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and the United Kingdom. Austria, Finland, and Sweden were added in 1995. For reviews of the literature on European monetary union, see Bean (1992), Kenen (1992), and Eichengreen (1993).*
2. *The treaty envisioned an earlier start-up date for monetary union, at the beginning of 1997, but only if a majority of members were ready in time. If a majority were not ready in time for that earlier date (as actually occurred), then the treaty specifies the currently planned start-up date at the beginning of 1999, with no requirement that a majority be ready.*

union, or the attempt to create a single European market (including free movement of capital) would fail.

Another reason for monetary union would be the resulting reduction in transactions costs on intra-European trade. Travelers would no longer have to exchange one money for another each time they crossed a national border. Over time, all the workers, computers, and other equipment currently used simply to convert one European money into another could be redeployed. The European Commission (1990) has estimated the gain from lower transactions costs to be modest, 0.3 to 0.4 percent of GDP every year, with the largest proportional gains going to countries with relatively unsophisticated and inefficient financial sectors.

Political considerations also played an important role. Countries such as France may have regarded monetary union as a way of gaining greater influence over their own monetary policy, as compared with the existing EMS, which is often interpreted as being dominated by Germany.[3] For its part, Germany may have supported monetary union in exchange for benefits on other issues, notably the acquiescence of its European neighbors in its rapid unification with the former East Germany (see Garrett 1994 and Woolley 1994).

While political considerations in some countries may have favored monetary union, critics such as Feldstein (1992) and Dornbusch (1996) argue that, from an economic perspective, monetary union would be a mistake for Europe. In their view, a country hit by a decline in worldwide demand for its output has two main ways of adjusting. One involves reducing relative prices and wages in the country affected. However, given the rigidities in European labor markets, a reduction in wages relative to those in other countries might occur only after a long and painful period of recession. The other way involves offsetting changes in economic policy, such as a loosening of monetary policy or a depreciation of the exchange rate that would reduce the need for nominal wage reductions. As far as individual countries are concerned, monetary union would eliminate the possibility of changing monetary policy or the exchange rate, forcing adjustment back primarily onto the labor market. From this perspective, the economic recoveries that occurred in Italy and Britain after those two countries allowed their currencies to depreciate in 1992 illustrate the advantages of retaining separate currencies and autonomy in economic policy-making.

| | | | Annual | Long-Term |
| TABLE 1 Maastricht Convergence Criteria, 1996 | | | | |
Country	Government Budget Deficit[a]	Government Debt[a]	Annual Inflation Rate (Percent)	Long-Term Interest Rate (Yield)
Criteria	**3.0**	**60.0**	**2.6**	**8.9**
Austria	4.3	71.7	1.7	6.5
Belgium	3.3	130.6	1.6	6.7
Denmark	1.4	70.2	2.2	7.4
Finland	3.3	61.3	0.9	7.4
France	4.0	56.4	2.1	6.6
Germany	4.0	60.8	1.3	6.3
Greece	7.9	110.6	8.4	15.1
Ireland	1.6	74.7	2.1	7.5
Italy	6.6	123.4	4.7	10.3
Luxembourg	+0.9	7.8	1.3	7.0
The Netherlands	2.6	78.7	1.2	6.3
Portugal	4.0	71.1	3.0	9.4
Spain	4.4	67.8	3.8	9.5
Sweden	3.9	78.1	1.6	8.5
United Kingdom	4.6	56.3	3.0	8.0

[a] As a percentage of GDP
Source: European Commission (1997)

Other economists counter that the absence of monetary union can itself be a source of problems. Buiter (1996) argues that if exchange rates are flexible, financial shocks will move them and result in temporary changes in international relative prices and wages that are not required by the underlying real fundamentals and that have negative effects on economic performance. In a similar vein, Obstfeld (1996) argues that as long as a discretionary devaluation is possible, a country has more than one economic equilibrium, some of which are worse for the country than a permanently fixed exchange rate. He suggests that Italy was in such a "bad equilibrium" prior to its devaluation in 1992, with unemployment and real interest rates both at suboptimally high levels.

Regardless of their motivations, European policymakers no doubt were hoping for a smooth transition to monetary union. The policymakers who signed the Maastricht Treaty in December 1991 probably believed that with minor exceptions, EMS exchange rates would be kept within the existing target bands until monetary union was achieved; in effect, monetary union would simply shrink the width of the bands down to zero. However, those expectations of exchange market tranquility were dashed just a few months after the signing.

The British pound and Italian lira came under enormous pressure as investors bet that those two governments would not maintain their exchange rates in the face of domestic economic weakness. In September 1992 both currencies dropped out of the EMS and soon fell well below their previous values. The following year further speculative pressures on other currencies led to a substantial widening of most of the EMS exchange rate bands from plus or minus 2¼ percent to plus or minus 15 percent. At that point, prospects for achieving monetary union on the Maastricht schedule looked dim.

However, since the crisis of 1993, exchange markets within Europe have been generally stable. In the case of members of the EMS the 15 percent bands allow for fairly large exchange rate movements, but most of the time central banks have succeeded in keeping actual exchange rates within much narrower boundaries. For example, throughout 1996 the French franc was kept within or very close to the narrow pre-1993 target band, even though officially the wide bands were in effect. As of this writing, with the exchange markets fairly tranquil and political leaders in key countries, notably France and Germany, still publicly committed, the odds on monetary union starting up in 1999 have

improved considerably from what they were during the crisis year of 1993. Nevertheless, major issues remain unresolved.

One of the major unresolved issues is the question of which countries will be part of the initial monetary union. The current plan is for the political leaders of the fifteen countries in the European Union to meet early in 1998 in order to make this decision. At that time, each country's economic data for 1997 should be available and could be compared with the convergence criteria in the treaty that provide guidelines for assessing a country's readiness for monetary union.

The Convergence Criteria

When the treaty was signed, economic conditions in the various EU members differed substantially. The treaty specified that to be considered ready for monetary union a country's inflation rate and long-term interest rates should first converge to values similar to those of other prospective members. The treaty also set targets for fiscal policy and exchange rate behavior for each prospective member.

The specific convergence criteria are as follows: inflation in each prospective member is supposed to be no more than 1½ percent above the average of the inflation rates in the three countries with lowest inflation rates; long-term interest rates are to be no more than 2 percent above the average interest rate in those countries; the exchange rate is supposed to have been kept within the target bands of the European Monetary System with no devaluations for at least two years prior to joining monetary union; and, importantly for the current debate, there are two requirements regarding fiscal policy. One fiscal criterion is that the budget deficit in a prospective member should be at most 3 percent of GDP; the other is that the outstanding amount of government debt should be no more than 60 percent of a year's GDP.

Table 1 shows each country's performance in 1996 relative to the criteria for inflation, long-term interest rates, fiscal deficit, and level of government debt.[4] A majority of the members of the EU satisfied the inflation and interest rate criteria, but nearly all were in violation of at least one of the two fiscal criteria.

The economic rationale for the fiscal criteria is that such limits are needed to ensure the support and commitment of all monetary union members to the goal of low inflation enshrined in the treaty. Historically, governments have sometimes used inflation as a way of

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3. For evidence on whether Germany dominates the EMS, see von Hagen and Fratianni (1990) and Herz and Roger (1992).
4. The exchange rate criterion is not shown because it does not have a numerical value. As discussed earlier, the exchange rate criterion requires that during the two years prior to a country's entry into monetary union, its exchange rate be kept within the target bands of the EMS, with no devaluations.

raising revenue to maintain spending on politically popular programs. Once monetary union is achieved, inflation could not be confined to one member but would necessarily involve the entire membership. A single member wishing to pursue an inflationary policy might exert pressure on the European Central Bank to raise inflation throughout the union. Alternatively, if a member government with large debts had financial difficulty, the European Central Bank might feel obliged to bail it out to avoid a financial crisis, at the cost of compromising its low-inflation goal.

> Critics argue that, from an economic perspective, monetary union would be a mistake for Europe. . . . It would eliminate the possibility of changing monetary policy or the exchange rate, forcing adjustment back onto the labor market.

The fiscal criteria were intended to ensure that only governments with sound finances would be able to enter the union. Moreover, to guard against future problems the members of the EU have agreed to set limits on deficits even after monetary union is achieved. According to the Stability Pact approved by European finance ministers in December 1996, members of the monetary union will be fined if they consistently violate the 3 percent limit on budget deficits (J.P. Morgan and Company 1996b).[5]

The economic rationale for the fiscal criteria has been questioned by many observers (see Bean 1992 and Kenen 1992). One issue is whether the specific numbers in the treaty are optimal. Buiter, Corsetti, and Roubini (1993) and Eichengreen (1994) argue that the numerical limits of 3 percent for deficits and 60 percent for debt are arbitrary and give little indication of whether a country is suitable for monetary union. According to Bean (1992), the only historical justification for these limits is that they happen to be close to the average that prevailed at the time the treaty was signed.

Masson (1996) argues that efforts to meet the deficit criterion have diverted attention from other important fiscal problems. He points out that since 1992 governments have often used the Maastricht criterion as justification for imposing tax increases. However, considering the sluggish growth and high unemployment that have prevailed in many European countries, he suggests that reductions in high tax burdens and cutbacks in social transfers—for example, generous early retirement benefits and high unemployment benefits that discourage job seeking—would seem preferable methods of reducing budget deficits because they would encourage an expansion of economic activity and, by so

doing, raise the tax base. In many European countries, high taxes are needed to finance government spending of 50 percent or more of national output. Moreover, like the United States, many European countries will face major fiscal pressures soon after the turn of the century as demographic factors cause soaring increases in the cost of retirement programs.[6]

More generally, it is debatable whether restrictions on fiscal policy are needed for a successful monetary union. Eichengreen and von Hagen (1995, 1996) note that many existing monetary unions, including the union of Belgium and Luxembourg, impose no debt or deficit limits on the members. In the United States, there is no nationwide agreement that limits the budget deficits of individual states. Some states do have limits on deficit spending, but these were adopted on a state-by-state basis and were not motivated by the desire to make monetary union viable.

Eichengreen and von Hagen study various monetary unions around the world, including the United States, Canada, and Australia. They argue that restrictions on borrowing by subunits of a monetary union are most common when those subunits have little control over their own sources of revenue: for example, in some countries almost all revenue is raised by the central government, with part being passed on to subunits to finance their activities. When the sub-units control their own sources of revenue, restrictions on borrowing are often not imposed.

In the European context, the national governments will be subunits after monetary union is achieved. Currently and for the foreseeable future, the national governments are financed predominantly with their own sources of revenue: very little spending is or would be financed by central EU institutions based in Brussels. Eichengreen and von Hagen conclude that the EU would therefore not need fiscal limits on the national governments in order to have monetary union.

Buiter (1996) also downplays the need for fiscal restrictions on members of the monetary union. In his view, a default or rescheduling by one member country—for example, Italy—would not necessarily be a problem for the EU as a whole. Its costs should properly fall on either the owners of the debt, Italian taxpayers, or those who benefit from Italy's public spending. The European Central Bank would become involved if a financial or banking crisis ensued, but in his view the way to avoid such a snowballing crisis would be to use bank supervision and regulation to set upper limits on the exposure of financial institutions to risks of default by European governments. Of course, such limits on exposure might require significant portfolio shifts because relative to their capital many banking systems currently have large exposures to their home-country governments.

Regardless of its economic desirability, the deficit criterion has taken on political importance, especially because of German leaders' insistence that only governments satisfying it be allowed into the monetary union. Germany's highest court has ruled that the fiscal criteria are an integral part of the treaty: if they are violated, Germany may be required to renounce monetary union (Gros 1995, 4). Given Germany's economic and political importance in Europe, its withdrawal of support would probably spell the end of monetary union.

The actual language of the treaty is not in fact so rigid. It indicates that political leaders can exercise some judgment rather than having to apply the convergence criteria mechanistically to determine a country's readiness. In particular, the treaty states that a deficit above 3 percent of GDP should not be considered excessive if the deficit "has declined substantially and continuously and reached a level that comes close" to the limit or if the deficit "is only exceptional and temporary" (European Commission 1997, 17).

With so many prospective members in violation of at least some of the convergence criteria, and little chance that major progress can be made toward meeting them in the few months remaining before decisions about initial membership are scheduled to be made, the shape of the initial union remains an open question.

The Initial Union: Maxi-, Mini-, or Delayed?

The combination of doubts about whether all or even most EU members would actually satisfy all the convergence criteria and the insistence of some countries (notably Germany) that the criteria be strictly enforced has generated continuing debate over what will actually transpire when the treaty's deadline for beginning the monetary union is reached. There are three main possibilities: a maxi-union, a mini-union, or delay.

Maxi-union. A maxi-union would be a broad monetary union that would cover most of the EU, including at least three of the four largest members, namely, Germany, France, Italy, and Britain. This alternative would generate the greatest benefits in terms of reduced transactions costs, but the diversity of its membership might produce severe internal strains as different countries push for different monetary policy choices. For example, according to Shilling (1997), 90 percent of mortgages in Britain have adjustable interest rates compared with only 30 percent in Germany. As a result, changes in interest rates have much stronger direct effects on homeowners in Britain than in Germany, effects that could at times result in divergent views about monetary policy in the two countries.

As far as entry is concerned, the biggest question marks are whether Italy and Britain will join. Italy very much wants to join the monetary union, in part as a matter of national pride.[7] Along with France and Germany, Italy was one of the founding members of the European Community in the 1950s, and it opposes the idea of being left behind by the others.[8] Unfortunately for its chances, Italy has for several years been in violation of the convergence criteria (European Commission 1997). Perhaps the biggest hurdle is its fiscal problem: its budget deficit has exceeded the 3 percent limit for some years, and its stock of debt has exceeded 120 percent of GDP, double the convergence criterion of 60 percent.

In recent years Italy has managed to reduce its inflation rate and long-term interest rates enough to more nearly satisfy those two criteria than in the past, and it has also cut its budget deficit substantially. Moreover, it reentered the EMS in late 1996, albeit with new target bands that implied a substantial devaluation (more than 30 percent) from the rate prevailing just before its departure in 1992. If Italy can keep its exchange rate within the new target bands until late 1998, it will come into compliance with the exchange rate criterion just prior to the scheduled start of monetary union. Nevertheless, only loose interpretations of the convergence criteria will make it likely that Italy can qualify for monetary union in 1999, given its fiscal problems.

Britain is in a relatively good position as far as the convergence criteria, but it has a traditional diffidence about tying itself to its continental neighbors as shown, for example, by its decision not to join the Common

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5. *The fines may range from 0.2 to 0.5 percent of a country's GDP and are imposed by vote of the political leaders on the European Council, the highest decision-making body of the EU. No fine is to be imposed if the deficit occurs during a severe recession or because of "exceptional circumstances."*

6. *The Organisation for Economic Cooperation and Development (OECD) (1995) shows that of the G-7 countries (the United States, Germany, France, Italy, the United Kingdom, Japan, and Canada), all except the United Kingdom will face major budgetary pressures from the interaction of demographics and retirement programs after the turn of the century.*

7. *See the* Financial Times, *October 11, 1995, and July 21, 1997.*

8. *For example, when the German finance minister stated that Italy would not be one of the initial members of monetary union, his remarks created a furor in Italy. The Italian prime minister responded by insisting that his country was committed to being an initial member and also suggested that the entire project be delayed rather than go forward without Italy. See the* Financial Times, *September 23 and 25, 1995.*

Market when it was founded in the 1950s.[9] In addition, Britain is particularly cautious about pegging its exchange rate because, rightly or wrongly, several periods of recession or sluggishness in Britain during this century have been blamed on pegging the pound at an overvalued rate.[10]

The Labour government that took power in May 1997 seems inclined to take a wait-and-see attitude, with the intention of joining monetary union only after it has proven to be a success. However, it is possible that Britain might decide to go ahead if nearly all the other members, including Italy, decide to start together in 1999.[11]

Mini-union. The second possibility is a mini-union that would leave out much of the EU. Most discussion of this option has focused on a possible union involving Germany, France, the Benelux countries, and perhaps one or two other small countries like Ireland or Austria. These countries have been in compliance with several of the convergence criteria for the past several years and are likely to continue in compliance in 1997 (European Commission 1997). Moreover, exchange rates within this smaller group have been kept within fairly narrow bands for the past several years.

Nevertheless, even the mini-union faces obstacles. One problem is that several of these countries are in violation of at least one of the convergence criteria, usually in the fiscal area. In particular, for some time Belgium has had outstanding debt of more than 120 percent of GDP. Moreover, budget deficits in Germany and France were above the convergence limit of 3 percent of GDP in 1995 and 1996, partly because sluggish growth has boosted spending on such items as unemployment benefits while cutting into tax receipts (European Commission 1997).

Delayed. The problems with the maxi- and mini-union options have led to speculation about a third option: delay. Perhaps the start of monetary union could be put off for two or three years in the hope that by that time Germany and France (and perhaps Italy) would be in compliance with the deficit criterion. This option would, however, cause acute political embarrassment for the leaders of France and Germany, who have been instrumental in pushing monetary union forward. Another risk is that during the interim other obstacles could arise that would indefinitely delay monetary union. The main risk, though, is the possibility that the new deadline might not be credible to market participants, resulting in financial market turmoil.

The Bargaining Process

How will the bargaining process turn out? Economic models of strategic behavior, in which the offers made by bargainers are influenced by their expectations about the future behavior of others, offer some insights. Chang (1995) develops a model in which two countries may benefit from monetary union but each wants to maximize its share of those benefits. In some cases the two countries will reach an immediate agreement and unify their currencies, but in other cases agreement will be delayed by a number of periods of bargaining. Moreover, private market expectations affect the length of delay. Alesina and Grilli (1993) examine whether a mini-union is a good first step toward complete monetary union. They consider the case in which a few countries in the EU proceed with monetary union and then, by majority vote, decide whether to allow additional countries to join. Because a maxi-union is politically feasible in their model, in the sense that every country is better off with a maxi-union than with no union, one might logically expect a mini-union to be a stepping stone to full union. Alesina and Grilli show, however, that a mini-union may in fact prevent complete monetary union because it may be in the interests of the initial members to veto the others. This analysis provides a rationale for Italy's reluctance to be left behind at the beginning of monetary union.

Other scenarios are possible. The Maastricht treaty specifies that the decision to admit an individual country into monetary union will not be made by a simple majority vote but by the vote of a "qualified majority."[12] Under this procedure, less than half the fifteen members of the EU could block a country's admission. De Grauwe (1996b) argues that if the most commonly discussed version of a mini-union is proposed (consisting of Germany, France, the Netherlands, Belgium, and Luxembourg, plus possibly Austria or Ireland), such a proposal will be blocked by negative votes from some of those left out. For example, the group of the four southern European members (Italy, Spain, Portugal, and Greece) have enough votes to block the mini-union. De Grauwe concludes that the only politically viable choices will be maxi-union or postponement.

Countries such as Germany might find maxi-union more palatable if a suggestion by De Grauwe (1995) and Gros (1995) were adopted. They propose that, rather than putting so much emphasis on whether a country meets the convergence criteria prior to the start of monetary union, as in the current transition process, the treaty be changed to take away a country's vote on the European Central Bank's governing board after the start of monetary union whenever that member violates the deficit limit. Under this approach, countries with large fiscal deficits could join and remain members of the union but would be unable to vote to bail themselves out of fiscal difficulty through higher inflation.

J.P. Morgan (1996a) suggests another possibility. A mini-union could start in 1999, with disappointed would-be members such as Italy or Spain assuaged by a conditional commitment that they would be allowed to

enter a year or two later, as long as they made further progress toward meeting the convergence criteria.

Because the members of the EU are constantly negotiating over a wide range of issues, there are many such options that countries strongly favoring an initial mini- or maxi-union can use to try to win over their opponents. Accordingly, as long as political leaders in the two largest countries in the EU, Germany and France, are committed to going ahead, the prospects for at least a mini-union beginning in 1999 seem favorable.

Market-Based Probabilities of Monetary Union

The prospect of monetary union has implications for the patterns of interest rates in Europe that can be used to make rough estimates of whether market participants expect monetary union to go forward. In the past, interest rates often differed considerably, even for the same borrower, depending on the denomination of the debt's currency. For example, Chart 1 shows that over the last several years short-term interest rates denominated in Italian lire have usually been at least 200 basis points above those denominated in deutsche marks, thereby compensating for expected depreciation of the Italian currency.

Once exchange rates are fixed permanently at the start of monetary union, currency of denomination should no longer affect interest rates in the member currencies because (for example) Italian lire and German deutsche marks would both be convertible into the new euros at a fixed and unchanging rate: expected depreciation of the lira vis-à-vis the deutsche mark would become zero. Long-term interest rate contracts that are written before monetary union but apply to periods after it should reflect this lack of future depreciation.

A special version of a concept called covered interest parity can be used to estimate the probability that market participants attach to monetary union going ahead on schedule. Intuitively, covered interest parity states that as investors seek the highest returns on their liquid assets in different countries, foreign returns that are hedged or "covered" against future changes in exchange rates will be equal to the returns on similar domestic assets.

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9. For instance, see Dornbusch (1996), Sutherland (1997), and the Economist (September 21, 1996).

10. One such episode occurred in the 1920s when Britain returned the pound to its pre–World War I value in terms of gold and the dollar (see Ingram 1983, 140–56). Another occurred in the mid-1960s, culminating in the devaluation of the pound in late 1967 (see Cohen 1969, 143–49).

11. See Sutherland (1997). One factor in Britain's decision is the concern of some economists and financial executives that London's role as a financial center would suffer if monetary union, especially a maxi-union, occurs and Britain stays outside. Their influence on the new government may be sufficient to overcome the doubters. See "Growing Fears in Britain of Single-Currency Isolation," New York Times, August 22, 1996, D2.

12. Qualified majority voting is a special system of weighted voting used by the EU. Under this procedure, large countries such as Germany and France have more weight than small ones such as Ireland and Finland. To be approved by a qualified majority, a proposal must win roughly 70 percent of the weighted votes.

More technically, covered interest parity states that in the absence of capital controls, the difference between the spot exchange rate (the rate on conversions of money from one currency to another that settle immediately) and the forward exchange rate (the rate on conversions of money that are agreed upon today but do not settle until some time in the future) is just enough to offset cross-country differences in interest rates, thereby making investors indifferent between investing at home and abroad. Covered interest parity, discussed in more depth in many international economics textbooks, can be represented as follows:

$$R^*_{t,T} - R_{t,T} = \frac{F_{t,T} - S_t}{S_t}, \qquad (1)$$

where $R_{t,T}$ is the interest rate in the home country at time t on securities (for example, Treasury bills or certificates of deposit) that mature at time T (for example, three months in the future); $R^*_{t,T}$ is the interest rate in the foreign country on similar securities with the same maturity date; S_t is the spot exchange rate at date t, measured in foreign currency per unit of domestic money; $F_{t,T}$ is the forward exchange rate, measured in foreign currency per unit of domestic money, that is agreed upon on date t but does not settle until the forward contract matures on date T (which coincides with the term of the interest rates $R_{t,T}$ and $R^*_{t,T}$).

Equation (1) is the most common form of covered interest parity; if it holds, and various researchers such as Frenkel and Levich (1975) and Taylor (1987) have found that it holds quite well when capital controls are not in force, an investor gets the same rate of return on a foreign security that is covered for exchange rate risk as on a domestic security.

Covered interest parity should also hold in terms of forward interest rates. A forward interest rate is an interest rate that pertains to a time period that begins not today but sometime in the future. For instance, suppose some investors have bonds that mature five years in the future, and they wish to lock in a return on those funds for three additional years. Some banks are willing to agree today to accept the investors' deposit of the bond proceeds five years from now and to pay them interest at a rate agreed today for the following three years. The interest rate on such a contract would be a forward interest rate with settlement five years in the future and a maturity of three years.

Suppose such investors were considering two options: investing at the forward deutsche mark interest rate or investing at the forward Italian lira interest rate. If deutsche marks are the home currency for these investors, at the maturity date of the forward interest contract they would receive $(1 + RD_{t,t^1,T})^{T-t^1}$ deutsche marks for each mark they deposited, where $RD_{t,t^1,T}$ is the annualized forward interest rate on deutsche marks today (at time t) for settlement at time t^1 with maturity date T; hence the funds would actually be on deposit for $(T - t^1)$ years.

Alternatively, if the investors made a covered investment in Italian lire, they would convert each deutsche mark to F_{t,t^1} lire at time t^1 (where F_{t,t^1} is the forward exchange rate in lire per mark prevailing today [at time t] for settlement at time t^1). They would then invest the proceeds until time T, receiving at the end the amount $(F_{t,t^1}) \times (1 + RL_{t,t^1,T})^{T-t^1}$ in lire; $RL_{t,t^1,T}$ is the annualized forward interest rate on lire today (at time t) for settlement at time t^1 with maturity date T. Finally, to be fully covered against exchange rate risk, the investors

CHART 2 Forward Interest Rates (Italy minus Germany, Weekly Average)

would have to make a contract today to convert their final proceeds in lire back into deutsche marks: each lira would yield $(1/F_{t,T})$ deutsche marks.

For investors to be indifferent between the two investment alternatives, the ultimate return on them should be equal, or

$$(1+RD_{t,t^1,T})^{T-t^1} = \frac{F_{t,t^1}}{F_{t,T}}(1+RL_{t,t^1,T})^{T-t^1}, \qquad (2)$$

where the term on the right-hand side is the covered return (in deutsche marks) from investing at the Italian forward interest rate. Equation (2) is another version of covered interest parity, expressed in terms of forward interest rates.

De Grauwe (1996a) observes that if market participants were convinced that permanent monetary union involving Italy and Germany would occur on schedule and that the times t^1 and T were both after the scheduled beginning of monetary union, then the forward exchange rates F_{t,t^1} and $F_{t,T}$ should be identical to one another. This equality would hold even if the postunion conversion ratio between lire and deutsche marks, S_{t^1}, was uncertain as of time t. In this case, equation (2) indicates that the forward interest rates $RD_{t,t^1,T}$ and $RL_{t,t^1,T}$ would be equalized as well, even if they were observed at time t well before monetary union.

As an example, Chart 2 shows the difference between lira and deutsche mark forward interest rates from 1990 through January 28, 1997. These are five-year forward interest rates on five-year interbank loans.[13] The horizontal axis gives the date of observation, t in terms of the notation in equation (2), where settlement date t^1 is five years after t and maturity date T is five years after t^1.

The earliest observations were made well before the Maastricht Treaty was signed, at a time when expectations of monetary union were presumably low. Moreover, for the early observations, most of the five-year periods covered by the contracts (the period between the settlement date t^1 and the maturity T) fell before the scheduled 1999 start date for monetary union. For example, the points on the chart for January 1991 represent contracts made in January 1991 with settlement dates in January 1996 and maturity dates in January 2001, implying that roughly three-fifths of the period covered by these particular contracts fell before 1999. The treaty was signed in late 1991, and as time passed the fraction of the period covered by these contracts that fell after the scheduled beginning of monetary union gradually rose, making expectations about monetary union more and more important in their deter-mination. After January 1, 1994, the entire period covered by these contracts fell after the scheduled beginning of monetary union.

During the first few months shown in Chart 2 Italy's five-year forward interest rate spread showed tremendous volatility, perhaps in part because capital controls were still in effect, though slated for removal. By the second half of 1990 volatility lessened, and the spread usually ranged between 300 and 500 basis points. Over the next few years the forward spread tended to rise and fall along with the short-term interest rate spread shown in Chart 1, but in the second half of 1996 the forward spread fell well below the short-term spread. In January 1997 the forward spread averaged only 87 basis points, even though the short-term spread for the next three months was still high, 411 basis points. The drop in the forward spread so far below the short-term spread is consistent with a market expectation that in the future Italian interest rates will be much closer to German ones than they are today.

A rough estimate of the probability of EMU can be derived from the forward interest rate spreads, as described by De Grauwe (1996a). Suppose the forward interest rate spread observed before the beginning of monetary union is a weighted average of the spreads that would prevail in two alternative scenarios—namely, that monetary union occurs on schedule or it is delayed indefinitely—with the weights being the market's assessment of the probability of each. That is,

$$s_t^o = p_t \times s_t^u + (1-p_t)s_t^N, \qquad (3)$$

where s_t^o is the forward interest rate spread versus the deutsche mark observed at time t (prior to monetary union), p_t is the market's assessment at time t of the probability that monetary union will proceed on schedule, s_t^u is the spread that would be expected to prevail if monetary union proceeds, and s_t^N is the spread that would be expected to prevail if monetary union does not proceed.

As discussed earlier, if the forward interest rates pertain entirely to the period after monetary union is scheduled to begin, they should be equalized, implying that s_t^u would be zero. In this case, equation (3) simplifies to the following expression for the probability of monetary union p_t:

$$p_t = 1 - (s_t^o / s_t^N). \qquad (4)$$

As noted earlier, data on s_t^o are available. The problem is estimating s_t^N, the forward interest rate spread that

13. Market quotations on forward interest rates in various European currencies were provided by J.P. Morgan and Company.

CHART 3 Probability of Entering EMU

France

Britain

Belgium

Italy

Spain
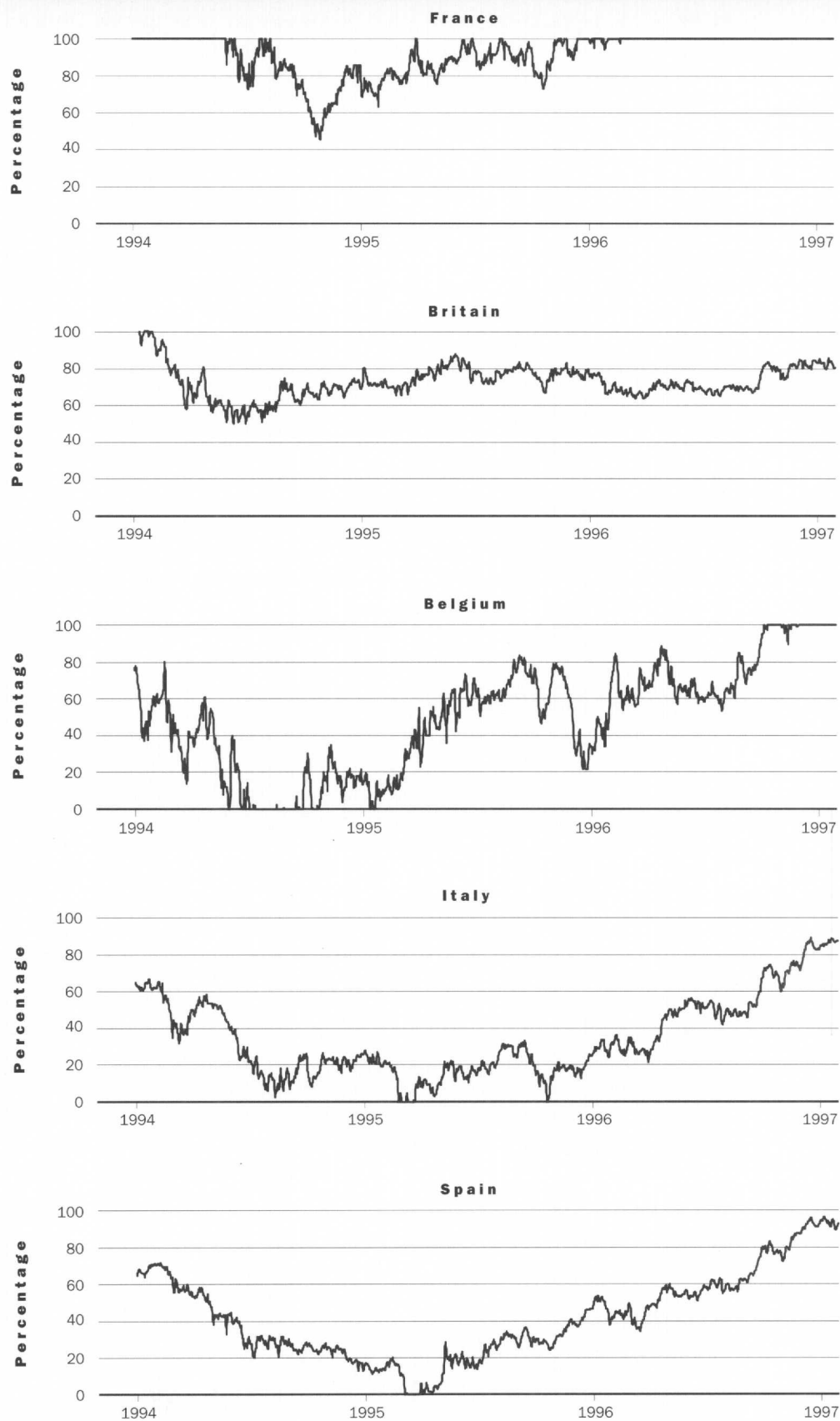
would be expected to prevail if monetary union does not proceed. De Grauwe suggests using the average spreads on five-year forward interest rates that were observed during 1990, a year before the Maastricht Treaty was signed and a time when monetary union seemed a remote possibility. However, charts of the data on spreads show great volatility for Italy (see Chart 2) and Spain in early 1990, including some sizable negative values (meaning that Italian and Spanish five-year forward interest rates fell substantially below German ones).

The position taken here, however, is that these negative values reflect market imperfections or capital controls and do not represent the market's true expectation about future interest rates. Indeed, Italy did not abolish its remaining restrictions on capital flows until May 14, 1990 (Ungerer and others 1990).

Accordingly, instead of using all of 1990 to estimate s_t^N, this study uses the average spread during the second half of that year. The resulting estimates of p_t for France, Britain, Belgium, Italy, and Spain are shown in Chart 3. The charts start in January 1994, when the five-year forward interest rates used in the calculations began to apply solely to the period after the scheduled commencement of monetary union in January 1999. The probabilities p_t calculated using equation (4) were converted to percentages by multiplying by 100. A value of zero corresponds to zero probability that the country will be part of monetary union, while a value of 100 corresponds to virtual certainty that the country will participate.[14]

The results for France indicate that the markets have usually regarded that country as being almost certain to participate in monetary union. The results for Britain are surprising: since 1994 market estimates of the probability of British participation have usually been well above 50 percent and in January 1997 some 80 percent. Considering the political opposition that exists in Britain, these probabilities seem high. De Grauwe (1996a, 11–12) obtains similar results but argues that 1990 was a poor benchmark year for such calculations in the British case because in October of that year the pound entered the EMS after months of market turbulence. Moreover, many observers claimed at the time

that the pound had entered the EMS at an overvalued exchange rate and that sooner or later a devaluation was certain. The forward interest rate spread for pound sterling that prevailed during 1990 may therefore not be an accurate proxy for the market's estimate of the spread that would prevail if Britain stayed out of monetary union. Another explanation of the surprising British results is given in the caveat below.

Belgium, Italy, and Spain all show notable increases in the last year or so of the period. De Grauwe (1996a), whose data sample ended in March 1996, reported that as of the end of his sample Belgium's probability of joining was about 60 percent while that of Italy and Spain was much less, perhaps 20 or 30 percent. Using the slightly different proxy for s_t^N (only the last half of 1990) and extending the sample through January 1997, the charts in this article show end-of-sample probabilities of about 100 percent for Belgium, 90 percent for Spain, and more than 80 percent for Italy. Strictly speaking, these are probabilities that the country in question will be in monetary union five years after the date of the observation. Accordingly, the observations from January 1997 indicate a high likelihood that these three countries will enter monetary union either at the scheduled beginning in January 1999 and certainly no later than January 2002.

Using a somewhat different approach, J.P. Morgan (1997) has also estimated market expectations of EMU that are quite high for most of these countries. This approach uses non-European financial data to estimate the forward interest rate spread for potential EMU members that would prevail if there were zero probability of the country joining.[15] The company's results indicate that market perceptions of the likelihood of a maxi-union increased noticeably in the second half of 1996, probably because of progress toward the Stability Pact at two political summits during the period. As of early February 1997, which was approximately the end of the data sample used in Chart 3, the Morgan approach yielded the following probabilities of joining EMU: 100 percent for France and Belgium, 85 percent for Spain, 66 percent for Italy, and 40 percent for Britain.[16] These

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14. In some time periods, the estimated probability obtained from equation (4) is either negative or above 100 percent. Negative values can occur if the observed spread s_t^0 is larger than the average spread that prevailed in the second half of 1990, when monetary union was presumably considered a remote possibility. Values above 100 percent can occur if the observed spread s_t^0 is negative, meaning that the country's forward interest rate is actually lower than Germany's. Because probability is normally defined only in the range between zero and 100 percent, the chart was drawn showing such observations as falling at either 100 or zero.

15. For example, J.P. Morgan regressed French franc forward interest rate spreads vis-à-vis Germany onto financial variables not directly affected by EMU, such as the U.S. three-month rate, the Japanese three-month rate, and the difference between ten- and two-year interest rates in the United States. The regression was estimated using data from the late 1980s and early 1990s, a period when expectations of monetary union should have been very low. The estimated coefficients were then applied to recent data on U.S. and Japanese rates in order to generate a proxy for the current value of s_t^N.

16. These probabilities were reported in the Financial Times, March 4, 1997. In later weeks the probabilities for Spain, Italy, and Britain dipped somewhat.

estimated probabilities are lower than those shown at the end of Chart 3 but are still quite substantial. If either set of estimates is correct, market participants have concluded that a mini-union, at least, seems virtually certain in the next few years and a maxi-union including the two largest countries in Southern Europe is quite likely.

The similarity of the probabilities obtained by different methods is comforting, but an important caveat is in order. All these estimates depend critically on the accuracy of the measure of the unobservable spread that would prevail if monetary union did not occur. If the proxy is not correct, the estimated probability derived using it will of course be inaccurate as well. Consider the case of Britain. In the chart, as noted earlier, the spread that actually prevailed between five-year forward rates on sterling and deutsche marks during the second half of 1990 was used as a proxy—321 basis points. By January 1997 that spread had shrunk to only 57 basis points, implying, using equation (4), approximately an 80 percent probability that Britain would join monetary union by 2002. However, the shrinkage in the spread has another possible interpretation: perhaps Britain's commitment to continuing low inflation became substantially more credible during the years between 1990 and 1997. In that case, one would expect a reduction in the spread vis-à-vis deutsche marks even if the market really was not expecting Britain to participate in monetary union.

While the caveat suggests that all these probability estimates should be treated with caution, the view here is that it does not vitiate the entire exercise. Perhaps the most interesting results are those for Italy and Spain. Though still not in compliance with the convergence criteria, these two countries have made important progress in reducing their budget deficits during the past few years. Italy has cut its deficit from 9.6 percent of GDP in 1993 to 6.6 percent in 1996, and Spain has cut its from 6.8 to 4.4 percent over the same period (European Commission 1997, 12). The governments of both countries have consistently supported their membership in the proposed monetary union. According to the results shown here, market participants think they have a substantial likelihood of joining the union.

Conclusion

More than five years ago the members of the EU decided to form a monetary union by the end of the decade. Many preparatory steps have been taken, but a number of key decisions, notably about which countries will be part of the union at its beginning, still remain to be made. These choices cannot be put off much longer.

There is little chance that most of the countries will comply with a strict reading of the convergence criteria for membership, but evidence from the financial markets suggests that by early 1997 market participants were leaning toward the belief that the political impetus in favor of a broad union might prevail in the end, resulting in a monetary union that would encompass a substantial portion of western Europe. The recent election in France has injected new uncertainty into the process, though, and final decisions about monetary union may remain up in the air until the last possible moment.

REFERENCES

ALESINA, ALBERTO, AND VITTORIO GRILLI. 1993. "On the Feasibility of a One- or Multi-Speed European Monetary Union." National Bureau of Economic Research Working Paper No. 4350, April.

BEAN, CHARLES. 1992. "Economic and Monetary Union in Europe." *Journal of Economic Perspectives* 6 (Fall): 31–52.

BUITER, WILLEM H. 1996. "The Economic Case for Monetary Union in the European Union." Cambridge University. Photocopy, November.

BUITER, WILLEM, GIANCARLO CORSETTI, AND NOURIEL ROUBINI. 1993. "Excessive Deficits: Sense and Nonsense in the Treaty of Maastricht." *Economic Policy* 16 (April): 58–100.

CHANG, ROBERTO. 1995. "Bargaining a Monetary Union." *Journal of Economic Theory* 66:89–112.

COHEN, B.J. 1969. *Balance of Payments Policy.* Baltimore: Penguin Books.

DE GRAUWE, PAUL. 1995. "The Economics of Convergence towards Monetary Union in Europe." Centre for Economic Policy Research Discussion Paper No. 1213, July.

———. 1996a. "Forward Interest Rates as Predictors of EMU." Centre for Economic Policy Research Discussion Paper No. 1395, May.

———. 1996b. "The Prospects of a Mini Currency Union in 1999." Centre for Economic Policy Research Discussion Paper No. 1458, September.

DORNBUSCH, RUDIGER. 1996. "Euro Fantasies." *Foreign Affairs* 75 (September/October): 110–24.

EICHENGREEN, BARRY. 1993. "European Monetary Unification." *Journal of Economic Literature* 31 (September): 1321–57.

———. 1994. "Fiscal Policy and EMU." In *The Political Economy of European Monetary Unification*, edited by Barry Eichengreen and Jeffry Frieden, 167–90. Boulder, Colo.: Westview Press.

EICHENGREEN, BARRY, AND JÜRGEN VON HAGEN. 1995. "Fiscal Policy and Monetary Union: Federalism, Fiscal Restrictions, and the No-Bailout Rule." Centre for Economic Policy Research Discussion Paper No. 1247, September .

———. 1996. "Federalism, Fiscal Restraints, and European Monetary Union." *American Economic Review Papers and Proceedings* 86 (May): 134–38.

EUROPEAN COMMISSION. 1990. "One Market, One Money: An Evaluation of the Potential Benefits and Costs of Forming an Economic and Monetary Union." *European Economy* 44.

———. 1997. "Report on Convergence in the European Union in 1996." *European Economy* (January, Supplement A, no. 1): 1–31.

FELDSTEIN, MARTIN. 1992. "The Case against EMU." *Economist*, June 13, 23–26.

FRENKEL, JACOB A., AND RICHARD M. LEVICH. 1975. "Covered Interest Arbitrage: Unexploited Profits?" *Journal of Political Economy* 83 (April): 325–38.

GARRETT, GEOFFREY. 1994. "The Politics of Maastricht." In *The Political Economy of European Monetary Unification*, edited by Barry Eichengreen and Jeffry Frieden, 47–65. Boulder, Colo.: Westview Press.

GROS, DANIEL. 1995. "Towards a Credible Excessive Deficits Procedure." Centre for European Policy Studies Working Document No. 95, July.

HERZ, BERNHARD, AND WERNER ROGER. 1992. "The EMS Is a Greater Deutschemark Area." *European Economic Review* 36:1413–25.

INGRAM, JAMES C. 1983. *International Economics.* New York: John Wiley and Sons.

J.P. MORGAN AND COMPANY. 1996a. "EMU: Impact on Financial Markets." European Fixed Income Research, August.

———. 1996b. "FX Markets and Europe's Stability Pact." Foreign Exchange Research, December.

———. 1997. "EMU Calculator Handbook." Global Foreign Exchange Research, January.

KENEN, PETER B. 1992. *EMU after Maastricht.* Washington: Group of Thirty.

MASSON, PAUL. 1996. "Fiscal Dimensions of EMU." *Economic Journal* 106 (July): 997–1004.

OBSTFELD, MAURICE. 1996. "Destabilizing Effects of Exchange-Rate Escape Clauses." University of California at Berkeley, Center for International and Development Economics Research Working Paper No. C96-075, December.

ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT. 1995. "Effects of Ageing Populations on Government Budgets." *OECD Economic Outlook* 57 (June): 33–42.

PADOA-SCHIOPPA, TOMMASO. 1994. "The EMS Is Not Enough: The Need for Monetary Union." In *The Road to Monetary Union in Europe*, edited by Tommaso Padoa-Schioppa, 117–34. Oxford: Clarendon Press.

SHILLING, A. GARY. 1997. "Good Luck, Tony." *Forbes* 159, February 24, 184.

SUTHERLAND, PETER. 1997. "The Case for EMU." *Foreign Affairs* 76 (January/February): 9–14.

TAYLOR, MARK P. 1987. "Covered Interest Parity: A High-Frequency, High-Quality Data Study." *Economica* 54 (November): 429–38.

UNGERER, HORST, JOUKO HAUVONEN, AUGUSTO LOPEZ-CLAROS, AND THOMAS MAYER. 1990. "The European Monetary System: Developments and Perspectives." International Monetary Fund Occasional Paper No. 73, November.

VON HAGEN, JÜRGEN, AND MICHELE FRATIANNI. 1990. "German Dominance in the EMS: Evidence from Interest Rates." *Journal of International Money and Finance* 9 (1990): 358–75.

WOOLLEY, JOHN T. 1994. "Linking Political and Monetary Union: The Maastricht Agenda and German Domestic Politics." In *The Political Economy of European Monetary Unification*, edited by Barry Eichengreen and Jeffry Frieden, 67–86. Boulder, Colo.: Westview Press.