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The evidence about the costs and benefits of the EMU

Jacques Mélitz*

Summary

■ This paper reviews and assesses the empirical evidence on the costs and benefits of the European Monetary Union (EMU). The first part centers on:

- The benefits of the reductions in transaction costs.
- Units of account and exchange-rate uncertainty.
- The potential costs of the loss of national control over seigniorage, or the tax revenues from money creation, in case of the EMU.

The next part deals with the responses to shocks, and separately considers the empirical evidence about the shocks and the responses. The discussion emphasizes the distinction between adjustment, or movement to a new equilibrium, and stabilization, or return to a previous equilibrium. In the subsequent evaluation, it is argued that the case against the EMU has been exaggerated. Stabilization and adjustment mechanisms are not as weak in Europe as they are sometimes made out to be. In addition, the evidence does not corroborate the view that the EMU can be expected to deliver worse monetary policy than national monetary independence. There is a certain probability of better monetary policy as well as one of worse monetary policy under the EMU (apart from issues of permanent inflation). Thus, the case against the EMU hinges essentially on risk aversion. But the required degree of risk aversion must suffice to outweigh the sure microeconomic benefits of the EMU coming from better monetary services.■

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What have we learned from the empirical evidence about the costs and benefits of the European Monetary Union (EMU)? To facilitate my exploration of the question, I assume that the EMU means a monetary union in the full sense of the term: a single currency with a single central bank and no internal exchange rate. By that definition, Belgium-Luxembourg is not exactly a monetary union. Correspondingly, I draw a sharp distinction between the EMU and any sort of fixed exchange-rate arrangement. As occasionally noted, there is no such thing as an irrevocably fixed exchange rate. Exchange rates are made to be changed. Luxembourg contemplated not following the Belgian franc at one point in the early 1980s. Precisely because leaving the EMU would mean reinventing an exchange rate and a separate currency, I treat the EMU as a regime more stable than one of fixed exchange rates. Many monetary unions have dissolved in the past; but in the cases according with my very strict usage (which excludes all six of Cohen's (1993) interesting examples), dissolution has always occurred because of the general breakup of a sovereign state—never for monetary reasons alone. Of course, the EMU might be the exception, and I seriously entertain that possibility, but only near the end of the discussion.

Besides identifying the EMU with a monetary union in the strictest sense, I also disregard any benefits of the system that might come from the promotion of a single market for output. As a final means of narrowing my task, I neglect all consideration of credibility. In general, giving up a separate currency to recuperate credibility in monetary policy is a second-best solution. If the EMU is not a good idea independently, a country would be well advised to avoid entering into the system simply in hopes of gaining credibility. There are other ways to achieve that objective and obtain a durable reduction in in-

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flation. Of course, credibility might become a decisive consideration if other, more direct benefits of the EMU did not clearly outweigh the costs. But I do not delve into the matter.

It is generally agreed in the literature on the EMU that the potential gains of monetary union predominantly relate to the steady state, whereas the potential costs mainly concern responses to shocks under disequilibrium. I will organize my discussion of the empirical work on the subject accordingly. The next section deals with steady-state effects, and the following three sections deal with implications of shocks. Section 5 assesses the costs and benefits of the EMU.

1. Steady-state effects of the EMU

1.1. Transaction costs, multiple units of account, and exchange-rate uncertainty

A single currency clearly implies a permanent reduction in transaction costs, fewer units of account, and the elimination of some exchange-rate uncertainty. The European Commission (1990) made an impressive documented effort to estimate the economies in resources that would result from these changes in an EMU that consists of all 12 of the then-current members of the European Community (the EC 12). The report distinguishes between the saving of banking services to all households and firms and other economies, strictly won by non-banking firms, which it calls *in-house*. Regarding the former economies, the Commission grounds its estimates on detailed information about intra-EC trade, currency-invoicing practices, and bid-ask spreads. In the case of the latter ones, consisting of reduced problems of managing separate currencies, recording and thinking in multiple units of accounts and hedging exchange risks, the Commission uses survey evidence. Based on all this work, the Commission proposes a gain of around 0.4 percent of GDP for the EC 12. The gain would be many times smaller for the big four EC countries (France, Germany, Italy, and the UK), which already benefit from a single money over a relatively large economic surface. Countries with backward financial systems would also profit exceptionally from a single money because of the greater narrowing of bid-ask spreads that they would obtain. Accordingly, the report estimates benefits of only 0.1 to 0.2 of GDP for the big four but around 0.9 percent of GDP for the rest (see EC (1990), pp. 261-62). These figures obviously would need to be adjusted up or down in the event of an EMU with fewer

or more than 12 members. Thus, in an EMU consisting of only two of the big four and four other of the members of the EC 12, the gains would be approximately cut in half.[1]

But if we take our distance, the estimates should be regarded as conservative, because all of the numbers suppose that banking will contract in the Community to the full extent of the reduction of the foreign-exchange business. In other words, the analysis assumes a mere reallocation of resources from banking toward other activities. Thus, if some of the improvements in microeconomic efficiency associated with a single currency raise the profitability of banking, rather than doing the opposite, the estimates are too low. Yet the mere ease of calculating in a single accounting unit over a larger economic surface should create some additional foreign trade in financial assets and goods and services, which, in turn, ought to spur some additional demand for the services of EC banks. As an extension, we know that financial portfolios contain an enormous home-country bias—far greater than any that can be explained based on preferences for home goods in consumption (together with deviations from purchasing-power parity). If those home-country preferences should be largely home-currency preferences, then portfolio investments in the EMU ought to shift toward more EMU issues of securities relative to those of outsiders, and the financial sector in the participating countries should benefit accordingly. Not all of the corresponding increases in value-added in banking would represent higher aggregate output but some would.

If we could go so far as to assume that banking would maintain its existing share in the contribution to aggregate income in an EMU, we must add the welfare triangles associated with the improved allocation of resources beyond the resource reallocation associated with the preceding 0.4 percent of extra output (strictly related to economies in bank services). All this extra income must also be divided among the members in a manner roughly proportional to the current importance of finance in these countries. The tendency would therefore lead toward more equality in the distribution of benefits among smaller and larger constituents.

[1] It could be argued that the benefits of EMU should not include the progress of the poorer members of the EC toward a more sophisticated financial environment, because these advantages would come to those countries independently. In particular, the report probably overestimated the benefits to Spain, whose financial development has nearly caught up with the highest levels in the EC 12.

There are other gains from the EMU. But these are almost impossible to quantify to any degree. They are related to the improvement in the quality of business decisions obtainable through the reduction in the number of units of account and exchange risk. But though unquantifiable, these gains might nevertheless be important. It seems plausible that some concern with simplification of decision-making underlies the positive perception of the EMU by business that is reported in *One Market, One Money*. The same factor probably helps to understand why the self-employed and managers are regularly recorded to have a better opinion of the EMU than other occupational groups in the surveys of *Eurobarometer*.

The reduction in exchange-rate uncertainty under the EMU calls for additional comments. This reduction is notably consistent with greater variability of the new EU currency than the earlier EU currencies relative to third currencies. Suppose that people tend to cover their bets when they move out of dollars into marks by going into francs as well. Then if the franc/mark disappears in favor of the euro, the exchange rate of the dollar with the euro may vary more than either the dollar/mark or the dollar/franc did before. But this is only true because the franc/mark is a gamble. Given the elimination of this next gamble, a reduction in total market risk must still follow from a common currency. Generally, as long as the ability to protect oneself against inflation exists independently, every third currency in the world creates some additional risk by adding an extra monetary policy, and by fragmenting the global demand and supply of money into more pieces.

Would the EMU really bring benefits by reducing exchange-rate uncertainty (beyond the aforementioned reductions in the costs of covering exposure)? This question arises partly because of the meager success of efforts to show that fixed rates promote economic activity by lowering exchange risk (see Edison and Melvin (1990) and Tavlas (1994)). But it is essential to see that the near futility of these efforts has little to do with the issue. A fixed exchange-rate system need not reduce exchange risk at all, but may merely modify the probability distribution of expected future exchange-rate changes. Under fixed exchange rates, exchange rates move discontinuously. Has exchange

risk really gone down if an exchange rate stays fixed with some probability and jumps with another? It all depends on:

- the probabilities.
- the size of the expected jumps.
- the duration between the jumps.
- the investor's attitude toward different probability distributions.

In a monetary union, there is no exchange rate to be uncertain about. Furthermore, one important reason why fixed exchange rates may fail to promote foreign trade and investment is that this system typically entails capital controls, while such controls have the directly opposite effect of discouraging trade and investment. A monetary union does not require capital controls. I had these points prominently in mind in choosing to define monetary union strictly at the beginning.

1.2. Tax consequences

When countries surrender a separate currency, they give up separate control over seigniorage as a source of tax revenues. The government can no longer raise revenues by issuing noninterest-bearing debt. In the EMU, the European Central Bank would assume control over seigniorage by regulating the growth rate of the money stock (which affects the inflation tax on money) and by fixing legal reserve requirements.

When the EMU first appeared on the horizon as a real possibility in the late 1980s, the loss of separate control over seigniorage seemed to pose a significant problem for several EC countries, because some still relied heavily on seigniorage revenues. But seigniorage revenues have generally dropped off in the EC 12. Perhaps even more significantly, a strong consensus has arisen in favor of the view that avoiding other taxes in favor of seigniorage is much less important than reaping the non-tax benefits of reducing both inflation and the allocative distortions of legal reserve requirements (compare Masson and Taylor (1993)).

Table 1 offers relevant data. Column 1 presents an EC figure for seigniorage in the EC 12 in 1990. Column 3 shows the results of applying an EC regression (bottom of the table) to estimate seigniorage in 1994. Column 2 shows the outcome of applying the same regression equation to 1990. Added in the rest of the table are data about inflation and legal reserve requirements which underlie the regression

estimates in columns 2 and 3. Based on that information, substantially drawn from Spahn (1993), seigniorage receipts of about 1 percent of GDP or under are now fairly common in the EU. Greece and Italy still may have some cause for concern about seigniorage revenues (largely due to debt considerations in the Italian case). But Portugal's worries on this score are fading fast (probably faster than my extension of the EC regression to 1994 would signify). As for the other members of the EU, they need hardly envisage any fall in seigniorage revenues under the EMU in light of their share in the general distribution.

Table 1. Seigniorage

Country	Seign-iorage[1]	Estimated seigniorage[1]		Reserve requirement on demand deposits		Remun-eration	Inflation		
	'90[2]	'90[3]	'94[4]	Mid-1988	End-1994		1980-90	'90	'94
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
BEL	0.75	0.30	0.15	0	0	-	4.5	3.5	2.4
DEN	0.46	0.50	0.21	0	0	-	5.8	2.6	2.0
GER	0.86	0.40	0.23	6.6 - 12.1	5	no	2.9	2.7	2.7
GREE	2.33	2.69	2.12	7.5	9	yes	18.5	20.3	10.9
SP	1.88	1.75	0.76	18.5	2	no	9.6	6.7	4.7
FR	0.55	0.76	0.26	5	1	no	6.3	3.4	1.7
IRE	0.58	1.17	0.50	10	3	yes	7.8	3.4	2.4
ITA	1.29	1.84	1.11	25	15	yes	8.7	6.1	3.9
LUX	0.11	0.35	0.15	0	0	-	4.8	3.7	2.2
NETH	0.79	0.48	0.54[5]	variable	variable	yes	2.0	2.4	2.8
POR	3.57	2.95	1.44	15	2	no	18.4	13.4	5.2
UK	0.34	0.58	0.28	0.5	0.35	no	6.2	8.1	2.4
AUS				4.5 - 8.5	9	no		3.3	3.0
FIN				-	2	no		6.2	1.1
SWE				4	0	no		10.4	2.3

Regression equation:

$$-0.358 + 0.0365 \text{ reserve requirement} + 0.146 \text{ inflation} \quad R^2 = 0.83$$
$$(0.45) \quad (0.017) \quad (0.027)$$

Notes: [1] Percentage of GDP.
[2] Vanheukelen (16.4.1991 EC document); also source of the regression equation.
[3] Spahn (1993). p. 576 (based on regression equation + columns (4) and (7)).
[4] Mine (based on regression equation + column (5) and the average of columns (7) and (9)).
[5] For the Netherlands, I followed Spahn's estimate based on a legal reserve requirement of 0.15.

Canzoneri and Rogers (1990) perform a valuable exercise in helping to evaluate the importance of seigniorage in the EC. They develop a model in which inflation is strictly assigned to minimizing the welfare costs of raising taxes and the inflation tax represents the sole means of taxing a large, illegal (black-market) sector in one of the EC countries. Even under those extreme assumptions, their simulations show that welfare gains of monetary union of the relevant order in our discussion, or around 0.05 percent of GDP, would roughly compensate the black-market economy for surrendering the inflation tax entirely.[2]

Three welfare issues remain, one of which the Maastricht Treaty may have already settled:

1. Article 32 of the Protocol of the Treaty on the Statute of the European System of Central Banks deals with the first issue. According to this Article, each country's share in the collective seigniorage in the EMU will depend half and half on GDP and population size. The question of the distribution of seigniorage revenues would thus seem closed.
2. The second issue concerns the collection of seigniorage from foreigners. Here, two opposite forces are at work. On one hand, a reduction in the number of European monies should permit foreigners (and any members of the European Union outside of the EMU) to economize on their holdings of currencies of the member countries. On the other hand, foreigners' desired transactions in the new EMU currency could be expected to rise because of the advantages of a single unit of account (from which they also benefit). This next rise in aggregate transactions should lead to higher desired stocks of the EMU currency in foreign tills. Either force could dominate.[3]
3. The third and last welfare issue leads into the next part of our discussion, where we abandon the steady state. Net flows in and out of Treasury deposits at the central bank vary a lot daily, weekly, and quarterly. In so far as the movements are stationary, monetary financing has no inflationary implications. Because it is essentially

[2] Of course, Canzoneri and Rogers assume the presence of alternative means of collecting taxes. If that assumption were put into question, as it can be for certain parts of the world, different results would follow.

[3] For an interesting discussion of a wider range of relevant considerations pertaining to banking, eurocurrency markets and official reserves, see Goodhart (1993) and Kenen (1993, 1995).

costless to administer, seigniorage is therefore an ideal response. In this respect, the loss of separate, national control of seigniorage is an unmitigated cost for everyone. Moreover, in the case of heavily indebted countries, the loss of the capacity to resort to monetary financing of any unexpected falls in net governmental receipts, whether temporary or not, can, in principle, lead to an additional risk premium. The market could penalize the governments out of concern for their loss of control over a particular tax.

2. Size of the relevant disturbances

In a monetary union, all member countries must accept the same monetary policy, whatever their circumstances. This constraint has been the greatest preoccupation, by far, in the empirical literature on the EMU. Several measures of the potential discomfort of a uniform policy for individual member countries have been proposed, and I begin by examining the simplest. All of the measures rest on disturbances in the environment.

2.1. Simple measures

Vaubel (1978) was perhaps the first to propose measuring the extent to which shocks to the economy might give countries cause to prefer different monetary policies from one another. He suggested the variance of real exchange rates as a fairly comprehensive indicator. Pursuing this idea, he calculated the variances of relative CPIs for four *länder* in Germany, 20 cities in Italy, 15 cities in the U.S., and as between the nine (then-current) members of the EC, and then compared all four variances. Of course, his variance of relative prices in the EC depended partly on exchange rates whereas his other three variances did not. The results disclosed far higher variances within the EC than within the three countries.

The next study, bearing the same stamp, by Poloz (1990), was the only one ever to display higher relative price variance inside a country than across countries. Poloz showed that the variances of relative prices between certain Canadian provinces (specifically, Saskatchewan and Alberta, the raw-material producing provinces) were higher than the similar variances between Germany, France, Italy, and the UK. This work is especially interesting in revealing the importance of the particular choice of price-level measure and geographical unit in the

analysis; for as Poloz explains, the use of CPIs for major Canadian cities instead of GDP deflators for different Canadian provinces would lead to the opposite results, that is, ones that conform to Vaubel's. With direct reference to Poloz, Eichengreen (1992a) subsequently compared the variances of relative CPIs between four U.S. regions (rather than four urban centers) and between 10 EC countries, and showed the variances within the U.S. to be lower. Corresponding data in Bayoumi and Thomas (1995, Table 1) leave no doubt that Eichengreen's earlier result would hold up in a comparison with 10 or more U.S. regions rather than only four.

In more recent work along the same lines, von Hagen and Neumann (1994) and De Grauwe and Heens (1993) simply try to mark off the countries that would be best suited for monetary union with Germany. Using CPI price data, von Hagen and Neumann (whose study circulated before De Grauwe's and Heens') conclude that the Benelux countries and Austria would be fitting partners for monetary union with Germany, while they consider the case in favor of some other EC countries as improving. De Grauwe and Heens, working with relative labor unit costs, regard France and Denmark, as well as the Benelux, as acceptable monetary partners for Germany in a monetary union.

But the main line of inquiry has followed a different tack, and has veered toward the distinction between symmetric and asymmetric shocks. Aoki (1981) demonstrated that if a shock occurs in two identical countries, the game-theoretical solution (in a perfectly linear model) could be described as the sums of the two national sets of values and the differences between the two.

Taking their cue from Aoki, Cohen and Wyplosz (1989) proposed using sums and differences to distinguish symmetric and asymmetric shocks (and they suggested measuring the shocks as deviations from baseline, or long-run equilibrium, values based on usual statistical techniques). A simple example will explain their idea to use sums and differences as measures of symmetry and asymmetry. Suppose two countries are subject to shocks of either +1 or −1. If they both receive identical shocks, the sum of the two shocks will be either +2 or −2, and the difference between them zero. But if they receive opposite shocks, then the sums will be zero, and the difference either +2 or −2. In the case of the common shocks, the variance of the sums will then be positive (+4) and the variance of the differences zero, while in the case of opposite shocks, the reverse will be true.

Hence, the ratio of the two variances can serve to reflect the relative importance of asymmetric shocks. This particular method could be applied to many variables, as Weber (1990) did. But subsequent discussion has largely centered on symmetric and asymmetric shocks to output.

Table 2 contains the results of using the previous method to measure asymmetry for 18 European countries since 1962. In order

Table 2. Ratio of asymmetric to symmetric shocks to output

	Method of sums and differences				Regression method			
	1962-89		1962-95		1962-89		1962-95	
Country	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Austria	.0392	3	.028	2	.612	4	.622	3
Belgium	.0544	8	.0402	5	.574	3	.607	2
Denmark	.0497	7	.0593	7	1.658	13	1.429	10
Finland	.0657	11	.2004	16	1.467	12	2.373	14
France	.0244	1	.0252	1	.268	1	.291	1
Germany	.0593	9	.0972	14	.518	2	2.138	13
Greece	.1064	16	.1474	15	3.228	17	3.261	17
Iceland	.6217	18	.6840	18	5.474	18	5.085	18
Ireland	.0363	2	.0439	6	2.583	15	2.668	16
Italy	.0653	10	.0789	8	1.100	9	.960	8
Luxembourg	.0485	6	.0381	4	2.312	14	1.980	12
Netherlands	.0433	4	.0374	3	.725	5	.693	4
Norway	.0859	15	.0929	12	1.747	13	1.570	11
Portugal	.2219	17	.243	17	2.615	16	2.417	15
Spain	.0699	13	.0808	10	1.087	8	.929	6
Sweden	.0437	5	.0682	8	1.012	7	.951	7
Switzerland	.0656	11	.0809	10	.953	6	.843	5
UK	.0849	14	.0967	13	1.301	10	1.288	9

Correlation between ratio of asymmetry and mean value of output:

Method of sums and differences		Regression method	
1962-89	1962-95	1962-89	1962-95
- 0.09	- 0.11	- 0.30	- 0.20

Data source: OECD. For an explanation of the tests and more detailed statistics, see the appendix.

to apply the technique to a field of 18 countries, I constructed a separate aggregate of 17 foreign countries in relation to each one and normalized each of the 17-country aggregates of foreign output (all 18 of them) so that they all would have the same average output as that of the relevant country in the comparison.[4] In the case of each country, therefore, the symmetric shocks represent the sum of national shocks and those of a corresponding foreign aggregate of 17 countries, while the asymmetric shocks represent the differences between the two.

I also applied a second method, based on panel-data regressions, which has usually served in the past to distinguish three shocks but can be simplified to separate only two. In the case of this second method (which we will encounter later in its more orthodox form), no aggregation occurs; a common effect of time on all the countries serves to identify a symmetric shock; and the regression residual can be interpreted as an idiosyncratic shock (differing by country and by date). The appendix contains details of both methods. Similar efforts to focus on the distinction between symmetric and asymmetric shocks usually stop short of German unification in 1990. But I have chosen instead to run the tests separately for 1962-89 and for 1962-95.

In the case of both tests, our interest centers on the importance of the asymmetric shocks relative to the symmetric ones, as measured by the variance of asymmetric shocks relative to that of symmetric shocks. Table 2 shows that for both test results and both sample periods, France is the country with the lowest ratio of asymmetric shocks, and thus the most representative country in the group. The least representative, at the opposite end, is Iceland. In the sample covering the period since German unification, Germany also appears in the atypical group, which consistently features Portugal and Greece and, to a lesser degree Norway and Finland as well. Indeed,

[4] Alternatively, I could have used growth rates instead of levels, and then no normalization would have been necessary since the growth of any country is directly comparable with that of the 17 others. But I still would have needed to construct a 17-country aggregate of foreign output for each country before I could find the growth rate of the foreign aggregate. In addition, I could not have done so by using a constant set of weights over the entire period. Therefore, I preferred not to convert into growth rates at all, simply to normalize at the means, and like Cohen and Wyplosz, to estimate the shocks based on the original series (in the manner explained in the appendix).

even before unification, Germany does not figure as particularly typical on the basis of the method of sums and differences. But this is readily explained. The method of sums and differences allots considerable weight to the other three big European countries in the comparison, since they loom large in the relevant 17-country aggregate. By contrast, the regression method gives roughly the same weight to every single set of national observations. Therefore, the method of sums and differences basically pits Germany against France, Italy, and the UK, whereas Germany and Italy and especially Germany and the UK differ notably. As a result, Germany seems only moderately typical. On the other hand, when the regression method is applied, all the small countries on the German frontier and closely attuned to the German business cycle, appear on equal footing with the big countries. Consequently, Germany gives the impression of being almost as representative as France.

The same difference between the two methods explains several other important discrepancies in rankings in the two indices, including those for Luxembourg and Ireland, the smallest and third smallest countries in the sample. Neither Luxembourg nor Ireland evidently differ markedly from the British-French-German-Italian axis. However, they both appear as outliers when all of the other small European countries in the comparison receive equal weight. In general, the results show that Belgium, Austria, the Netherlands, and arguably Sweden are also highly representative countries besides France and Germany (with appropriate qualifications for Germany).

Table 2 invites an interesting, alternative reading. Imagine that Europe had been a fully integrated economic area during the period. In that event, there would have been considerable regional specialization. Consequently, were we to cut up the European surface into smaller and smaller regions, we would find that asymmetric shocks would rise as a percentage of output in the individual region. But the common or symmetric shocks would stay roughly of equal size as a percentage of output. Thus, with the progressive subdivision of Europe into ever smaller pieces, we would obtain increasing ratios of asymmetric to symmetric shocks per individual subdivision. In so far as Europe is an integrated space, we must therefore expect to find a negative correlation between the size of individual countries and our indices of asymmetry. In fact, we do find such a negative relationship, but it is small: only –0.30 over 1962-89 and –0.20 in 1962-94 based on the regression method, and even lower, around –0.10 in both pe-

riods based on the Aoki method. Part of the reason for this small negative correlation lies in the fact that two of our big countries, Italy and the UK, display moderately high ratios of asymmetric shocks as compared with the rest. However, the most important factor in the result is the exceptionally well-diversified character of some of the smaller countries, including Belgium, the Netherlands, and Austria. One reasonable interpretation (which need not hold for every single small country, independently of physical resource endowment and geography) is that the nation-state status of these small countries has led them to assemble a wider array of industries than they would have as parts of a larger, single national economy. In this respect, our results confirm Krugman's (1991) well-known thesis, to which we will return, that regional concentration of production is essentially higher in the U.S. than in Europe.

2.2. More sophisticated measures

2.2.1. The distinction between shocks and responses

The preceding simple measures of relevant disturbances have encountered two major criticisms: first, the failure to distinguish between the shock as such and the subsequent return to equilibrium; and second, the excessive aggregation of the asymmetric category. Eichengreen (1990), in particular, has insisted on the distinction between shock and response from the beginning of his very considerable work on the EMU. In joint research with Bayoumi (1993), he has more recently sought to apply the distinction by using the method of structural vector autoregression (SVAR). While differentiating shock and response, Bayoumi and Eichengreen also separate temporary and permanent shocks on output. They denote the permanent shocks supply ones and the temporary shocks demand ones (in accordance with Blanchard and Quah (1989)). However, it proves useful to center attention on their distinction between temporary and permanent shocks without necessarily following their supply-and-demand designation.

To see the good sense of Bayoumi and Eichengreen's preoccupations, consider two deviations from equilibrium of identical size, one of which consists of a large temporary shock to output followed by a quick adjustment, and the other of a small permanent shock followed by a long adjustment. For the purpose of this theoretical example, let us simply think in terms of hypothetical deviations from a straight-

line growth path while ignoring the previous measures of shocks in the last subsection. In the first hypothetical instance, a big problem exists, which monetary policy may have helped to hold in check. In the other instance, there is a small problem, which monetary policy might only have kept alive. According to usual macroeconomic analysis of OECD economies in general and EU ones in particular, the value of monetary policy lies in stabilizing aggregate demand and employment, and thereby preventing unemployment. If active in our second example, therefore, the policy would merely have served to postpone the required factor reallocation.[5] Losing monetary policy independence would then be much more troublesome in the first case than the second one.

Nevertheless, it should be noted that shocks do not come labeled as temporary or permanent. Take the case of the shock to the national defense sector caused by the end of the Cold War in the early 1990s. The economies of Massachusetts and California both suffered a blow. Massachusetts still remains in substantial difficulty, whereas California is well on the way to recovery (see *The Economist*, March 30-April 5, 1995, p. 49). Therefore, the temporary or permanent nature of a shock evidently depends a great deal on the recuperative powers of the afflicted area and its size and diversity.[6]

Table 3 summarizes the results of Bayoumi and Eichengreen's analysis, where they compare 11 EC countries (the EC 12 minus Luxembourg) with 8 regions of the U.S. (based on the Council of Economic Advisers classification). Since the U.S. makes up roughly

[5] Note that the literature on *dependent economies* takes a radically different view. In this literature, a devaluation supposedly *provokes* adjustment by lowering the product wage in the traded-goods sector relative to the non-traded goods sector, thereby causing demand for labor to shift toward traded goods. According to this perspective, a devaluation induces labor movement toward traded goods (see Lizondo and Montiel (1989)). This mechanism, which hinges on full employment, has little place in the empirical discussion of EMU—for good reason, I believe, though the matter probably deserves more attention.

[6] These considerations evidently undermine the demand-supply interpretation of the shocks, especially as applied to regional economies. Clearly, it makes little sense to say that Massachusetts suffered a supply shock (permanent) while California suffered a demand one (temporary), though it might make some sense to do so in a similar comparison of two national economies. As we will see, there is also much evidence that shifts in aggregate demand have permanent regional effects in the U.S.

Table 3. Growth. Permanent and temporary shocks

	Growth of real GDP		Permanent shocks		Temporary shocks	
	SD	Correlation	SD	Correlation	SD	Correlation
EC countries	(1)	(2)	(3)	(4)	(5)	(6)
GER	.022	1.00	.017	1.00	.014	1.00
FR	.018	.74	.012	.54	.012	.35
BEL	.022	.73	.015	.61	.016	.33
NETH	.022	.79	.017	.59	.015	.17
DEN	.025	.67	.017	.59	.021	.39
UK	.021	.54	.026	.11	.017	.16
ITA	.023	.52	.022	.23	.020	.17
SP	.027	.56	.022	.31	.015	- .07
IRE	.022	.09	.021	- .06	.034	- .08
POR	.034	.57	.029	.21	.028	.21
GREE	.035	.66	.030	.14	.016	.19
Un-weighted average	**.025**	**.59**	**.021**	**.33**	**.020**	**.18**
U.S. regions						
Mid-East	.025	1.00	.012	1.00	.019	1.00
New England	.031	.94	.014	.86	.025	.79
Great Lakes	.040	.88	.013	.81	.033	.60
Plains	.027	.85	.016	.30	.022	.51
SE	.027	.76	.011	.67	.018	.50
SW	.022	.40	.019	- .12	.018	.13
Rocky Mts.	.024	.27	.018	.18	.015	- .28
Far West	.033	.66	.013	.52	.017	.33
Un-weighted average	**.029**	**.67**	**.014**	**.46**	**.024**	**.37**

Source: Bayoumi and Eichengreen (1993).

Columns 1 and 2: OECD data 1960-88; Columns 3 to 6: tests covering 1963-88.

Standard deviations (SD): 0.027 signifies a standard deviation of about 2.7 percent.

as large an economy as the EC 11 and has a similar level of economic development, the significance of the comparison should be underlined. Column 1 shows the standard deviations of the growth rates of output as somewhat higher in the U.S. regions than in the EC 11 (2.9

percent as opposed to 2.5 percent on average). On this evidence, the U.S. regions were subject to bigger "shocks," or, if one prefers, bigger deviations from baseline, than the EC 11 in the study period of 1960-88. Column 2 shows that the growth rates of output were also moderately more correlated in the U.S. than in Europe. (Bayoumi-Eichengreen measure the correlations by using a reference area in each case, the Mid-East in the U.S., Germany in the EC 11.) Hence, if we applied our previous crude indices of asymmetry to the data in Table 3, we would probably come up with lower ratios of variances of asymmetric shocks to variances of symmetric shocks for the U.S. than Europe, but only to a moderate extent—especially if we limited ourselves to a hand-picked selection of EC countries or an EC "core."

The remaining columns show what happens after Bayoumi and Eichengreen's transformation of the data and their identification of separate, permanent and temporary shocks.[7] Based on their statistical treatment, virtually all the shocks appear smaller (of lower standard deviation) than the earlier deviations from baseline (column 1). They are also less correlated than before. The temporary shocks are still lower on the average in Europe than the U.S., in accordance with the raw data (column 1), but the permanent shocks become higher on average in Europe than the U.S. In addition, the fall in the correlation coefficients (columns 4 and 6), which holds generally, is much more marked for Europe than for the U.S. Very significantly too, as Bayoumi and Eichengreen show (but I do not repeat because of lack of space), their analysis implies considerably faster responses to either type of shock in the U.S. than in the European case.

Their last point, regarding the faster speed of responses in the U.S. than the EC, puts everything neatly in order. If adjustment takes longer in Europe, then full return to the initial equilibrium is more likely never to happen. Therefore, it is logical that the statistical analysis would show a higher relative significance of permanent shocks in Europe than the U.S. That is, the higher *ratio* of permanent to temporary shocks in Europe than the U.S. (21/20 to 14/24 on

[7] It should be explicitly observed that Bayoumi and Eichengreen make joint use of output and output-price data. The reason why we can nevertheless interpret their two shocks as temporary and permanent shocks to output (rather than price) is that their essential identifying restriction concerns the long run, cumulative value of output.

average) makes good sense. One force nevertheless might have acted in the opposite direction, or toward lower relative ratios of permanent to temporary shocks in Europe. If U.S. regions are more highly specialized than European countries, as we have indicated might be true, then many shocks proving permanent in the U.S., because they will be resolved through interregional factor movements, should show up as only temporary in Europe, where they will be absorbed through the reallocation of factors within the same national boundaries.[8] Evidently, this force, even if operative, did not hold sway.[9]

2.2.2. The decomposition of asymmetric shocks

A totally different line of criticism of the earlier, simple distinction between symmetric and asymmetric shocks focuses on excessive aggregation in the asymmetric category. Two separate arguments apply. One regards the chance that asymmetric shocks would come from desired movements of money between countries. If so, a monetary union would provide the ideal remedy. In a monetary union, money would simply flow between the countries in the desired direction without provoking changes in interest rates and exchange rates (see Buiter (1995)). The other argument pertains to the possibility that asymmetric shocks, even if issuing from goods markets, would essentially concern a particular industry. In this case, the use of monetary policy to respond to the shock might be wrong. Consider a shock to a part of manufacturing. If the monetary authorities induce a depreciation of the exchange rate to assist the particular industry(ies), the associated fall in interest rates could cause overheating in construc-

[8] As we shall see, with respect to relative regional performance, or the return to some interregional equilibrium, the results do indeed go precisely in this direction.

[9] However, Bayoumi and Eichengreen reason differently. They express surprise at the higher standard deviation of temporary shocks in the U.S. than Europe and attribute it to greater regional specialization in the U.S., that is, to Krugman's argument. Yet I fail to see how the greater specialization of a region than of a country in the comparison can lead to a greater tendency to absorb shocks without geographical factor movement, especially when the adjustment also occurs quickly. Eichengreen (1992b, n. 14) attempts to reconcile his position with the evidence by proposing to think in per capita terms. On that view, a shock leading toward the permanent decline of a region to the same per capita output as before is only temporary. But Bayoumi and Eichengreen's statistical analysis will not brook this interpretation. Their statistical work rests on aggregates rather than per capita data, and a region dwindling down to the same per capita level after a shock must be seen, in their treatment, as the victim of a permanent shock.

tion, and the rise in the price of imported raw materials could damage transportation and defense.

Bini-Smaghi and Vori (1992) took up this last argument, using the previous regression method in section 2.1 to distinguish between industrial, regional (U.S.)/national (EC), and common (U.S.-wide or EC-wide) shocks to manufacturing as such. In so doing, they actually make orthodox use of the method, which has generally served to estimate the same tripartite division of shocks. Stockman (1988) had previously applied the method to distinguish industrial, national, and internationally common shocks in a European sample. Based on the evidence, Bini-Smaghi and Vori report a significant proportion of industry-specific shocks to manufacturing both in the EC and the U.S. Applications of the method generally yield this result.

More recently still, Bayoumi and Prasad (1995) have extended Bini-Smaghi's and Vori's results by dividing the aggregate GDP of the eight U.S. regions studied by Bayoumi and Eichengreen and eight EU countries (the only eight of the EC 12 for which they had the data readily available) into eight industrial groupings. Table 4 shows the outcome. One basic interest of Bayoumi and Prasad's exercise is to broaden the perspective on industrial concentration. Bayoumi and Prasad effectively confirm Krugman's view of greater geographical concentration of manufacturing in the U.S. than in Europe, and they also show this view to hold for primary products. However, they find Europe to be more geographically concentrated than the U.S. in the other six industrial groupings, especially services, finance, and wholesale-retail trade. On the issue of the relative significance of industry-specific shocks, Bayoumi and Prasad essentially obtain the same results as Bini-Smaghi and Vori. Specifically, they find those shocks to be roughly as important as the country-specific ones in Europe. As Table 4 shows, the two types of shocks make roughly equal contributions to disturbances on the average for Europe.[10] Therefore,

[10] In this conventional application of the regression method, the country-specific effects possess separate regression coefficients, and the residuals cannot be allocated between the explanatory variables. The same is not true in my adaptation of the method in Table 2, where the only fixed effects relate to cross-country shocks, and the residuals can be interpreted as country-specific effects. See the appendix.

Table 4. Output diversification and sources of deviation from mean growth rates of industries

			R^2 due to various shocks			
EU countries 1970-1987	Mean output share (sum =100) (1)	Coefficient of variation of output share (2)	Common (3)	Industry (4)	EU country or U.S. region (5)	Aggregate (6)
Primary	.06	.67	0	.31	.08	.26
Construction	.07	.19	.17	.19	.16	.51
Manufacturing	.28	.22	.38	.15	.19	.71
Transport	.09	.17	.28	.13	.28	.69
Trade	.14	.21	.28	.07	.28	.62
Finance	.14	.32	.34	.07	.15	.56
Services	.09	.48	0	.20	.09	.27
Government	.13	.20	.21	.32	.02	.55
All	**100**	-	**.19**	**.18**	**.16**	**.52**
U.S. regions 1970-89						
Primary	.08	.87	0	.39	.17	.43
Construction	.05	.15	.36	.11	.34	.80
Manufacturing	.21	.28	.67	.24	0	.83
Transport	.09	.11	.45	.31	.06	.81
Trade	.16	.06	.41	.37	.16	.94
Finance	.15	.12	.13	.16	.33	.61
Services	.14	.17	.49	.11	.26	.85
Government	.12	.14	0	.33	.28	.54
All	**100**	-	**.29**	**.25**	**.19**	**.73**

Source: Bayoumi and Prasad (1995). Trade = wholesale + retail trade. EU countries: Austria, Belgium, Denmark, Germany, Greece, Italy, Netherlands, and the UK. U.S. regions: as in Table 3.

Regression equation: $\Delta \ln\left(y_{i,j,t}\right) = \psi_t + \alpha_{i,t} + \beta_{j,t} + \varepsilon_{i,j,t}$

$\Delta \ln\left(y_{i,j,t}\right)$ = Δ of log of output of industry i in region/country j.

ψ_t = coefficients associated with dummy of 1 for all industries and regions/countries in period t.

$\alpha_{i,t}$ = coefficients associated with dummy of 1 for industry i in all regions/countries in period t.

$\beta_{j,t}$ = coefficients associated with dummy of 1 for industries in region/country j in period t.

Bayoumi's and Prasad's research, like Bini-Smaghi's and Vori's, says that many of the idiosyncratic shocks—be they of real rather than financial origin—cannot be treated through the exchange-rate instrument. An earlier study by Eichengreen (1993) bore the same implication. In an examination of the impact of the real exchange rate on various regions of the UK and Italy, Eichengreen obtained several significant, opposite signs for different regions. In the case of the UK, he also found three regions where a depreciation of the pound had a significant effect going in the opposite direction to that of an equally significant effect for the associated rise in real energy prices.

In conclusion, all the previous criticisms of the simple, crude measures of symmetric and asymmetric shocks are well founded.

3. Macroeconomic estimates of impact of loss of monetary independence

3.1. Dynamic simulations of world models

The foregoing evidence obviously leaves us short of an answer to the question of the welfare implications of surrendering monetary independence in the EU. A few studies have tried to push the analysis further by using dynamic simulations of large-scale models. Regrettably, these studies have not received the attention they deserve. In particular, the studies provide a strong antidote against the frequent tendency to come to strong conclusions based on the previous evidence.

Three simulation studies are focused on here: The European Commission (1990, Annex E), Minford *et al.* (1992), and Masson and Symansky (1992). All three introduce a succession of shocks drawn randomly from the joint distribution of the error terms during the estimation period. In principle, every major kind of shock in our previous discussion crops up. The long-run evolution of the essential variables of interest are also taken to be independent of the shocks, and therefore all the shocks in the simulations are considered as temporary even if the return to the "baseline," as it is known, takes very long. The Masson-Symansky study holds special interest because of the authors' attempt to reconcile the differences between the two earlier studies. Masson and Symansky repeated the simulations of Minford *et al.*, initially done with the Multilateral Liverpool World

Model, on the basis of MULTIMOD, the model that the EC had used (precisely to permit comparison).

In the first of the three studies, the EC research team reported more stable economic performance in the post-1987 EMS (or the mature form of the system) than under floating exchange rates. But the best performance of all came under the EMU. Minford *et al.* strongly contested these conclusions, particularly as regards the inferior performance of floating exchange rates to the EMS. Masson and Symansky agree with Minford *et al.* that the EC had placed the floating regime at a considerable disadvantage by introducing excessively wide deviations from interest-rate parity under a float. But as regards the essential comparison between the EMU and floating rates, Masson and Symansky come to a totally inconclusive verdict. To quote them: "On average there does not seem to be too great a difference between the four regimes in our simulations [that is, EMU or a float under a money target or either of the two under an income target]." Upon closer examination, the same verdict applies to Minford *et al.* despite the authors' tendency to stress their finding that a *cooperative* float by France, Germany, Italy, and the UK performs better than the EMU. This last result of theirs, however, depends exclusively on the superiority of floating for the UK. As concerns the other three countries, the simulations of Minford *et al.* uniformly show the EMU as considerably superior to a float.[11]

These inconclusive results deserve contemplation since all three studies omit microeconomic benefits of a common money and do not allow for improvements in wage discipline or inflation performance under the EMU (though the EC research team discusses this possibility separately). Judging from some of the literature, one might have thought that under these circumstances, the only issue would be how much worse the EMU would fare than a float. Yet the ambiguous results arise for compelling reasons.

In the first place, the EMU avoids non-cooperative solutions, which are distinctly inferior when shocks are perfectly symmetric. This point echoes the well-known fact that the EMU can be useful in preventing competitive devaluations. In effect, this aspect of the analysis evidently plays an enormous role in the Minford *et al.* simulations, where substantial differences arise in the welfare implications of non-cooperative or cooperative floats, and important welfare dif-

[11] See Minford's (1992, p. 134) own summary of the results of Minford, *et al.*

ferences also occur depending on the exact composition of the EMU members and therefore which country plays which game (even in the case of the non-European participants such as Canada and Japan).[12] On the other hand, the cooperative and non-cooperative aspects are irrelevant in the EC and Masson and Symansky simulations, where the authors suppose the monetary authorities simply to follow a rule (a possibility that Minford *et al.* also entertain). Yet a corresponding factor arises in these two studies: namely, the possibility of important deviations from perfectly optimizing behavior based on the choice of monetary rule. As Masson and Symansky show particularly well, the choice of targeting money, money income, or something else, injects an unpredictable element into the simulations, working any which way in the comparison of the regimes. But since targeting reflects the essential presence of imperfect information, the issue smacks of reality. Monetary authorities do resort to the sorts of intermediate targets that the EC research team and Masson-Symansky feature, and they do so precisely out of ignorance of a better way of approximating optimal outcomes on a regular basis.

Last but not least, all three sets of simulations implicitly recognize the advantage of monetary union in dealing with asymmetric shocks of financial origin. The simulations do so by admitting random deviations (ex post) from open interest rate parity whenever different currencies are present, but imposing identical short-term nominal interest rates whenever countries belong to a monetary union. The deviations from interest rate parity induce erroneous financial-portfolio decisions in all three studies, which basically reflect substitutions between home and foreign financial assets that would be better handled through automatic cross-country movements of money under the EMU. It makes sense to accord the EMU an advantage on this score. But the mere introduction of this advantage, together with either departures from perfectly optimizing behavior as a result of monetary rules, or else some element of non-cooperative optimization, suffices to create major ambiguity about the very presence of costs of monetary union in all three studies.

[12] It should perhaps be noted that in games with many players, counter-intuitive outcomes are possible. For example, cooperation between the European countries could leave all of them worse off because of U.S. reactions (see Canzoneri and Henderson (1991)). But obviously the plausibility of such third-party effects depends on the magnitudes and requires separate support.

3.2. Dynamic simulations of SVARs

Simulations resting on structural vector autoregressions (SVARs) provide an alternative econometric technique for trying to evaluate the welfare implications of giving up monetary independence. Two studies have followed this next approach, and both of them cast up ambiguities about the value of monetary independence. In the first, Erkel-Rousse and Mélitz (1997) try to isolate a shock to the excess demand for money at home relative to that for money abroad. They do so for six European countries and then look at the way the shock affects inflation and real performance. If the shock impinges on real activity, then monetary policy has potential influence, for better or for worse. But if instead, the shock merely alters prices, monetary policy cannot do much—at least not to smooth economic performance as such.

In a second effort to use SVARs to draw lessons about the value of monetary independence as such, Mélitz and Weber (1996) attempt to identify money supply shocks for France and Germany. Having done so, they try to simulate a common monetary policy in those two countries, defined as a common set of monetary surprises. Next, they examine how both economies would respond to the identical policy. Of course, the point of their exercise is to get some practical idea of the possible damage that both countries would suffer from a monetary policy imposed partly or fully by the other.

In both studies, doubts arise about the cost of the EMU—at least for some national party. Erkel-Rousse and Mélitz find that exchange-rate shocks do indeed essentially affect nothing but prices in some European countries. Mélitz and Weber conclude that France would have gotten higher growth and lower inflation under German monetary policy than the country actually experienced before the policy of the *franc fort*. This last conclusion is reasonable. Official opinion took a turn in France at the time of the adoption of the *franc fort*; and there is nothing strange about the conclusion that the earlier monetary policy was a mistake. Essentially, both of these studies introduce into the analysis some important limitations on the value of independent monetary policy. In one case, the admitted difficulty is the possible interference of wage-price flexibility with the effectiveness of policy. The additional difficulty arising in the second study (besides the earlier one) is the possibility of mistaken policy. But once these limitations are allowed, they seem to carry weight in the conclusions.

4. Adjustment mechanisms and stabilization effects

A different, important branch of research on the EMU concerns the mechanisms that would remain in place to deal with economic disturbances in the member countries of the union. The relevant studies also examine how these mechanisms would evolve. In some sense, this next part of the literature takes the change in regime under monetary union more seriously to heart than the one we have considered thus far. If monetary policy cannot do the job of smoothing economic performance at home, what will? And how will monetary union itself modify the answer?

In examining the empirical section of the relevant literature, I shall distinguish sharply between adjustment and stabilization. I will use adjustment to mean strictly movement toward new equilibria and stabilization to refer to the return to the same equilibrium as before. Upon careful examination, it is clear that the literature on the EMU, and optimum currency areas in general, has put special emphasis on adjustment. The preoccupation with the mobility of labor makes this plain. Yet the corresponding need to attach particular importance to permanent shocks has rarely received notice. Stationary shocks often serve exclusively in treatments of optimal monetary policy both in the closed and the open economy, and the literature on the optimum choice of exchange-rate regime frequently takes these shocks as the basis of analysis. If independent monetary policy matters especially in improving adjustment, we must reason differently. In examining adjustment mechanisms in this discussion, I will subsume permanent shocks, whereas in treating stabilization mechanisms I will subsume temporary shocks instead. Adjustment mechanisms will be considered first and stabilization mechanisms later.

4.1. Adjustment mechanisms

Adjustment mechanisms may either take the form of movements in relative prices and wages or movements in factors. Let us examine the two in order.

4.1.1. Adjustments in relative prices and wages

We have already seen evidence of considerable flexibility in relative prices of output among different regions of a country. Both Canadian and U.S. data provide impressive evidence of regional variations in output prices, particularly in regard to regions specializing in pri-

mary goods. Important cumulative movements in real exchange rates between countries also take place during periods of perfectly fixed exchange rates. The EC (1990, p. 37) records such changes for the UK/Ireland, Belgium/Luxembourg, and the Netherlands/Germany in the post WW II period and pertinently observes that: "Between Germany and the Netherlands there was even a cumulative difference of about 20 percent for the 19 years (from 1950 to 1969) when the exchange rate was fixed." Similarly, De Grauwe and Vanhaverbeke (1993) mention changes of 20-30 percent in unit labor costs in the Netherlands and Belgium, respectively, relative to the rest of the world in the 1980s—a period when neither country had significant recourse to domestic monetary policy.

If we are willing to suppose that real exchange-rate changes tend to be stabilizing over the long run, then the evidence in column 1 of Table 5 is telling. On this assumption, column 1, drawn from Bayoumi and Thomas (1995), says something very important: namely, that nominal exchange-rate movements mostly compensate for inflation over the long run in the EC 11 (the EC 12 minus Luxembourg). Only three of the EC 11 obtained equilibrating adjustments in nominal exchange rates relative to Germany from 1973 to 1989. Those three countries include the two which altered their exchange rate least relative to the mark: Belgium and the Netherlands. As regards the other seven except the UK, movements in the exchange rate relative to the mark tended to offset changes in the domestic price level rather than to contribute to adjustment. In four of the cases, the offsetting tendency is very pronounced.

If we are ready to make a different assumption, namely, that whatever may be true for nominal exchange rates, money prices of goods change in a stabilizing direction, then the evidence of the bottom of Table 5 is also very pointed. This part of the table, which is drawn from De Grauwe and Vanhaverbeke, shows a highly significant positive correlation between dispersions of relative unit costs of labor (measured a particular year) and dispersions of growth rates of output (measured the same year) between separate regions of four European countries over a series of years. That correlation holds true for three of the countries separately and for all them together. If wider differences in regional growth rates are associated with wider differences in unit labor cost during a year, then on the previous assumption about

Table 5. Varied indicators of adjustment and stabilization

	Correlation between changes in output prices & nominal exchange rates 1973-89	Estimates of elasticity of nominal wage with respect to prices	Openness 1994
Countries	(1)	(2)	(3)
Austria			0.37
Belgium	0.24	0.25	0.69
Denmark	0.38	0.25	0.32
Finland			0.33
France	- 0.33	0.50	0.22
Germany	-	0.75	0.29
Greece	- 0.20		0.22
Ireland	- 0.55		0.65
Italy	- 0.56	0.60	0.23
Luxembourg			0.88
Netherlands	0.26	0.50	0.49
Portugal	- 0.74		0.33
Spain	- 0.49	0.25	0.22
Sweden			0.35
UK	- 0.03	0.33	0.27
Canada		0.18	0.33
Japan		0.66	0.08
U.S.		0.14	0.11

Sources: column (1): Bayoumi and Thomas (1995), table 2; column (2): OECD (1989); column (3): OECD, *National Accounts*. Openness = exports + imports divided by twice GDP (at current prices).

Correlations between measures of dispersion in real exchange rates and growth of output or employment 1977-1985:

Regions of:	Output	Employment
Germany	.60**	.03
Spain	.79***	.53**
Netherlands	.95***	.20
UK	-.41	-.38
All regions	.73***	.50***
All countries	-.03	.53*
All countries and regions	.27**	.22*

Source: De Grauwe and Vanhaverbeke (1993, p. 123). Regional data from *Eurostat*. ***, **, * : significance at 1 percent, 5 percent and 10 percent levels, respectively.

Note: Dispersion is defined as the standard deviation of the regional or national growth rates (as the case may be) in an individual year.

changes in goods prices, the price mechanism tends to promote regional adjustment. If instead of measuring the dispersions based on regional observations, we measure them strictly cross-country, the correlation becomes insignificant (–0.03 for "all countries" in the "output" column). Therefore, if the relative unit labor costs greatly hinge on the nominal exchange rate, the previous correlation fades.

Since Bruno and Sachs (1985), it has been generally recognized that real wages respond less to price-level changes in Western Europe than North America. The basic inference has been that monetary policy is a less valuable tool of adjustment and stabilization in Europe than North America. It should be noted, nonetheless, that elasticities of nominal wages with respect to prices differ widely between individual European countries in ways that we would be loath to interpret as a clue to the relative efficacy of monetary policy in the countries. The second column of Table 5 presents a set of frequently quoted OECD estimates of the elasticity of nominal wages with respect to prices. The numbers are particularly low for the U.S. and Canada, but not much higher for Belgium, Denmark, and Spain. The really big figures concern Germany and Japan. Yet we would hardly wish to argue that Belgium and Denmark have much more to lose from giving up their monetary independence than Germany and Japan.

An important, related consideration is the increase in wage discipline that might follow from the EMU as a result of higher wage competition. There is some encouraging evidence showing that the effort to limit exchange-rate flexibility in the European Monetary System has tended to promote wage discipline (see especially Artis and Ormerod (1991)). The EMU would obviously be more successful if greater flexibility of real wages compensated the fall in real exchange-rate flexibility.

4.1.2. Adjustments in capital and labor

Adjustment to permanent shocks may also occur through factor movement. Such movements relate generally to shifts of labor and capital between occupations and industries. In the case of small, specialized regions, the factor adjustments are also likely to require geographical movement in or out of the region. If the European Union is less regionally specialized than the U.S. (regarding which we have seen some contradictory evidence from Bayoumi and Prasad), then *ceteris paribus*, less inter-regional factor mobility will be needed in an

EMU than in the U.S. As concerns geographical movement, the adjustment of (physical) capital and labor may perhaps best be seen as a single topic since the essential alternative may be one between firms moving toward workers or workers moving toward jobs.

There is substantial evidence from many sources that regional unemployment does little to attract firms, whereas low regional wages draw them, and inversely that high regional labor demand and high regional wages both attract workers. Blanchard and Katz (1992) confirm this observation for the U.S. in a study of the regional adjustment of the 50 states plus the District of Columbia. A point of reference in the literature, the Blanchard and Katz study puts the mobility of American workers in the limelight. The authors show that following a regional shock, the interstate distribution of rates of unemployment tends to return to the earlier level within five or six years, whereas labor movement proceeds significantly for about a decade. Relative real wages also play a secondary role in the adjustment process. The emphasis on interregional labor mobility in the study would necessarily diminish if the U.S. was divided up into 8 or 12 sections instead of 51. But the basic picture would likely remain the same.

The facts of geographical labor mobility in the EU differ radically. Not only is the cross-country mobility of labor small in the EU, but even the geographical movement of labor within EU countries is much lower than in the U.S. To quote Eichengreen:

> Americans move between U.S. states about three times as frequently as Frenchmen move between *départements* and Germans move between *länder* (1993, p. 131).

> In 1980, for example, 6.2 percent of the U.S. population changed its county of residence, 3.3 percent its state of residence. In contrast, only 1.1 percent of the English and Welsh population moved between standard census regions, and only 1.3 percent of the German population moved between *länder* ... Interregional mobility is even lower in Southern European countries such as Italy and Spain (1992, p. 22).

In a broad review of the evidence, Mantel (1994) makes the arresting observation that with the rise in unemployment in the 1970s geographical labor mobility notably declined in Europe, only to perk up

again in the late 1980s when employment returned to an expansionary path.

We possess only three studies to date analyzing the difference in factor adjustment to shocks in the EU and the U.S. The first, by Eichengreen (1990), compares nine regions of the U.S. with the EC9. The second, also by Eichengreen (1993), compares the previous 9 U.S. regions with 9 regions in Italy, and 10 in the UK. The third study, by Decressin and Fatás (1995), compares the 51 U.S. regions of the Blanchard-Katz article with an identical number of European ones, and alternatively, with only the British, French,[13] German, Italian, or Spanish members of the sample. As regards the rates of unemployment, all three of these studies show surprisingly high speeds of adaptation in the regions of Europe relative to the U.S. Eichengreen (1990) finds speeds of adjustment only about 20 percent slower on average in Europe than the U.S. But in his 1993 study, where he focuses on regional adjustment *within* two European countries rather than between different European ones, he finds the regional adjustment to be both faster and better defined in Europe than the States. Decressin and Fatás show pronouncedly faster adjustment of rates of unemployment in Europe in general.

All these studies focus on deviations of regional (national) performance from an equilibrium relationship to other regions (other nations), and therefore all of them (including the Blanchard-Katz one) deal strictly with asymmetric shocks. In the earlier Bayoumi-Eichengreen paper, the focus was on individual regional (national) output performance, and the only indications of symmetry or asymmetry consisted of correlation coefficients between separate regional (national) estimates. The significance of this distinction emerges plainly in Decressin and Fatás, who show that if they compare the responses of rates of unemployment in the regions to a common shock, while viewing each region separately, that is, in isolation from the rest, they obtain a much slower rate of adjustment in Europe

[13] Actually, Decressin and Fatás do little with separate French data, since they find the results for this country to be poor. They attribute the problem to the brevity of their French series, but the difficulty could lie instead in the low degree of regional diversity that they find for this country relative to the others, including the U.S. The much higher R^2 for France in their table A2 ($\overline{R}_T^2$ in their notation) than for the rest implies smaller deviations from the national norm, thereby undercutting the quality of the French results in the remainder of the analysis.

than in the U.S., just as Bayoumi and Eichengreen did (in dealing with output growth), and as we might expect from other sources.[14]

One basic factor in the explanation of the faster regional adjustment in Europe than in the U.S. is the lower interregional labor mobility in Europe itself. Since regional adjustment to a shock goes on as long as workers move, the very persistence of interregional labor movement over a considerable time in the U.S., and the lack of any similar occurrence in Europe, will slow down the return to an equilibrium interregional relationship in the American case relative to the European case.

What does explain the factor adjustment in Europe if interregional labor mobility does not provide the answer? The question remains largely open. One feature of the explanation is probably fiscal federalism, or the central government budget's tendency to transfer disposable income toward regions in difficulty. As we know, this mechanism is particularly important in Europe, more so than in the States, and would therefore explain at least some of the faster speed of adjustment in the European case. Perhaps another element of the answer is the mobility of capital and labor *within* regions or countries (depending on the unit of analysis). A lot of factor reallocation evidently takes place over time in Europe despite the fact that people move less. For example, Abraham (1994) finds a significant response of regional wages to regional labor productivity in five EC countries, even after including aggregate national productivity in his regression. It is only reasonable to think that some of the associated impact on regional employment manifests itself in workers shifting between jobs rather than continuing to do exactly the same thing in the same place.[15]

[14] In an application of the same SVAR methodology as Bayoumi and Eichengreen (1993) to deviations of (growth rates of) regional (national) output from national (international) levels in the U.S. and the EC, Bayoumi and Thomas (1995) similarly find far slower responses in the U.S. than Europe. This is in flagrant contradiction with the earlier Bayoumi-Eichengreen results dealing with the identical statistical series with identical statistical methods and theoretically corresponding identifying conditions. The difference cries out for discussion.

[15] According to Decressin and Fatás, changes in the labor force participation rate are *not* part of the answer to the riddle of the faster European adjustment. In their study, the regional participation rate returns to an equilibrium in close to six years both in Europe and the U.S (though with a different profile in the two cases: see their Figures 10 and 11).

4.2. Stabilization mechanisms

Temporary shocks call for stabilization rather than adjustment. In the case of such shocks, corrective movements in the terms of trade would be helpful, just as before in response to permanent shocks, but movements in productive factors, capital and labor, are exactly what we want to avoid. Two special and important methods of dealing with temporary shocks are borrowing and insurance. Borrowing can occur internally via government deficit spending, or externally via current account deficits. On the other hand, insurance, which concerns essentially transfers, *must* come from elsewhere. Therefore, as regards a region, insurance (or transfers) will depend on the central government budget, and in case of a nation, on some kind of international insurance. What role do such mechanisms play in Europe, and what role could they potentially exercise in stabilizing output in an EMU?

4.2.1. Foreign borrowing and changes in international portfolios

Imports represent one basic stabilizing response to a temporary shock in commodity markets. Either a temporary fall in supply or a temporary rise in demand for goods will provoke a rise in net imports, which will stabilize consumption and probably output (less so in the case of a supply shock than a demand one). The more open the economy, the greater the response of net imports as a percentage of output. In this respect, more open economies get more stabilization and correspondingly can afford to rely less on movements in their terms of trade. In the case of a temporary shock coming from financial markets (portfolio management), the monetary regime is important. If the affected region or country belongs to a monetary union, the region or country will obtain perfect insulation from the shock. Money will simply flow between the region or country and the rest of the monetary union without any effect on activity or prices in the currency area as a whole. On the other hand, if the affected region/country has a separate money, then its nominal exchange rate will respond, causing a movement in the terms of trade. In this instance, the more open the region/country, the greater will be the transmission of the shock to the goods market. More open economies thus benefit less from a separate money and exchange rate on all counts.

The EU economies happen to be very open, the German one perhaps even disproportionately so in terms of its size. The third

column at the top of Table 5 provides relevant figures, including some for the U. S. and Japan. EU nations can therefore expect to obtain a lot of stabilizing movement in their current account balance in response to temporary shocks in goods markets. They can also anticipate a lot of destabilizing movement of their current account in response to temporary financial-market shocks. In both respects, these countries have reason for less attachment to a separate money and exchange rate.

How would increasing integration of capital markets, resulting from EMU, affect the stabilization that the member countries receive? Paradoxically, the answer is ambiguous (which shows the importance of keeping the issue of increasing capital-market integration apart). As regards temporary asymmetric shocks from financial markets, greater capital market integration can only improve matters, since the right response to such shocks is to avoid any change in interest rates. Even as regards regional shocks from goods markets, greater capital-market integration can only help the owners of movable capital assets by enabling them to cover themselves at lower cost through portfolio diversification. However, workers cannot cover themselves against temporary regional shocks to employment: imperfections in the capital market restrict their ability to borrow against future wages. For this reason, a solidifying of interest-rate relationships in the EU, through greater capital market integration, will prove destabilizing for workers in the event of shocks to commodity markets. The national interest-rate deviations stemming from such temporary shocks happen to be stabilizing.

Some important work comparing domestic and international integration of capital markets has taken place. Atkeson and Bayoumi (1993) have shown that inside the U.S., capital income responds far more to national conditions than to local ones. In a related investigation, Thomas (1993) demonstrated the absence of any positive correlation between regional saving and regional investment in Canada, Germany, and the UK, while Denkle (1995) has done the same for Japan. All these empirical findings support the presence of a highly integrated capital market within nations. Since Feldstein and Horioka (1980), we are also well aware of the fact that empirical tests yield radically different results for cross-sections of countries at the international level. These two authors display a powerful positive impact of domestic saving on domestic (as opposed to foreign) investment, and related studies show a high positive correlation between saving

and domestic investment. Considerable debate has arisen concerning the proper interpretation of these positive relationships. Are they a manifestation of imperfect international mobility of capital, as Feldstein and Horioka think, or a sign of legal interferences and exchange-rate risk at the international level?[16] From the standpoint of the present concerns, however, it does not matter which of these two views is correct as long as we agree that the EMU will transform the situation in Europe to one more closely resembling that ruling inside a country. In either case, we will then see a significant increase in the uniformity of interest rates across Europe. As shown earlier, the outcome will be stabilizing in some regards, destabilizing in others.

Krugman (1993) has also argued, quite interestingly, that temporary shocks may tend to become permanent if countries form a monetary union. Instead of attracting an inflow of securities and equities, a positive shock to exports will be more likely to bring in imports of capital and equipment as well as labor. The export boom may thus reinforce potential output in the region (nation) and sustain regional growth, whatever may be true about net exports (which could even turn negative).

4.2.2. Automatic stabilizers and fiscal federalism

By lowering tax receipts and raising unemployment compensation and other transfer payments, a temporary adverse shock to a country will automatically lead to a government deficit. We usually call these mechanisms automatic stabilizers. Similarly, when a temporary, adverse shock hits a particular region rather than an entire country, the central government budget will tend to shift resources from the rest of the country toward the afflicted region. This next mechanism is known as fiscal federalism. At the level of the EU, automatic stabilizers are important, and fiscal federalism is not. In the event of the EMU, this situation will probably persist: the automatic stabilizers will probably retain much of their current significance, while fiscal federalism will remain trivial. The minor character of fiscal federalism in the EU stems partly from the moderate size of the EU budget, which comprises only around 1.5 percent of EU GDP, partly from the low responsiveness of EU spending programs to country-specific shocks.

[16] Compare Dooley *et al.* (1987) and Bayoumi and Rose (1993), on one hand, and Lemmen and Eijffinger (1995), on the other.

At the regional level in the U.S., balanced-budget provisions and tax competition between the states render the automatic stabilizers unimportant. On the other hand, fiscal federalism matters a great deal. Hence, in the case of an adverse shock, a U.S. region fares worse than an EU country in one respect, better in another. On balance, the EU country fares much better; but the point usually gets lost in the emphasis on fiscal federalism.

Some serious evaluations of fiscal federalism in the U.S. have taken place, and they indicate that a U.S. region suffering a loss of one dollar through a temporary shock will recover 15 to 30 cents from the rest of the union, mostly through reduced contributions to federal taxes. The lower estimate comes from Goodhart and Smith (1993), the higher one from Bayoumi and Masson (1995). Both estimates rest on single-equation regression analysis. In a simulation study based on a large-scale model with a detailed public sector, Pisani-Ferry *et al.* (1993) come up with an estimate on the lower end, 0.17. Generally, detailed consideration of the mechanisms underlying fiscal federalism in the U.S. favors the 0.15-0.17 range. As regards automatic stabilizers in Europe, however, the estimates always range above 0.30 for the rich countries. All of the foregoing authors, for example, propose figures for those countries in the 0.33-0.35 range.[17] One important reason why the automatic stabilizers in Europe are so much larger than fiscal federalism in the States is that the U.S. federal government does not finance unemployment compensation. As a result, fiscal federalism in the country does not include those important transfer payments. But another major factor is that aggregate government budgets in the EU generally far exceed the size of the federal government budget in the U.S. Those two budgets are the relevant ones in the comparison.

It is admittedly true that automatic stabilizers may be expected to diminish in significance in the EMU because of greater mobility of taxable resources, the Maastricht criteria about debts and deficits, and the recent Waigel Pact. One could also argue that, so far as tempo-

[17] Pisani-Ferry *et al.* only look at fiscal federalism at the regional level in Europe and the U.S. But their results for France and Germany clearly imply automatic stabilization at the national level of no less than 0.37 for the first, 0.33 for the second. An unusually high, early estimate of the stabilizing impact of fiscal federalism in the U.S. of 0.35-0.40 by Sala-i-Martin and Sachs (1992) was subsequently discredited by von Hagen (1992) and Bayoumi and Masson (1995).

rary shocks leave a permanent trace on government debt, popular concern with the future tax implications of current government deficits could render automatic stabilizers less potent than fiscal federalism.[18] But one would have to exaggerate the importance of these qualifications in order to question the conclusion that, at least for the foreseeable future, EU countries will continue to get more stabilization through their own government programs under the EMU than the U.S. regions get through the U.S. federal government. The current gap in the orders of magnitude is simply too great.

5. A general evaluation of the evidence

In reaching some general conclusions about the costs and benefits of EMU, I will attach special significance to the distinction between expected values and risks. Let us begin with expected values.

5.1. Expected values

The strongest reason to expect benefits of the EMU resides in the gains of a better money, which were discussed in connection with the steady state. After careful study, the European Commission (1990) evaluates the resources currently invested in coping with 11 member currencies as around 0.4 of 1 percent of GDP for the former EC 12 as a group. In addition, we saw that we should expect the financial sector in these countries to find new productive opportunities that limit the damage this sector would suffer from the elimination of the relevant foreign-exchange transactions and the associated cover for exchange risk. Upon general reflection, the EC's figures do not appear unreasonably high, if we consider that the financial industry alone now accounts for about 6 percent of EC-12 GDP, and a total gain of half of a percent of GDP for the EC 12 would still only amount to less than 10 percent of the value-added for the industry. I find the EC's calculations all the more reasonable because they show much larger benefits to the smaller countries (with smaller currency areas) than the larger ones.

Can we then consider that the EMU would create matching costs of around 0.4-0.5 percent of GDP because of the sacrifice of independent monetary policy? That is the question. In other words, does the ability to decide monetary policy nationally offer the equivalent of

[18] Bayoumi and Masson (1996) take this view.

a permanent flow of benefits of nearly half of one percent of GDP on the average in the EU—closer to 0.2 of 1 percent for the bigger countries and to a full 1 percent for the smaller ones? Of course, each national case requires a separate answer. But based on the general evidence, I will argue that Germany aside (as the country with the most monetary independence in the EU and an exceptionally good record in monetary policy), we cannot really assign a positive value to the net expected costs of the loss of monetary independence resulting from EMU.

Even in the area of monetary policy as such, monetary union has its advantages. It avoids non-cooperative outcomes and assures the appropriate response to asymmetric financial shocks. Furthermore, many of the shocks stemming from goods markets are too industry-specific to be treated properly by monetary policy. When monetary policy does yield potential gains, the benefit level may also be low because of wage-price flexibility (or *real*-wage inflexibility), and the opportunities for gains may be difficult to exploit because of information problems. Policy mistakes may also squander those opportunities. All the studies that have directly addressed the costs of losing monetary independence, instead of extrapolating from laboratory types of experiments, inspire doubts, even if the authors do not always articulate them. Upon reflection, this is not surprising. There remains controversy today about the Federal Reserve's contribution to U.S. stability and welfare in the postwar period. If the same question of benefits of central-bank decision-making arises for other, smaller countries, which are more open and more prone to real-wage rigidity, must we not expect outrightly skeptical answers?

The literature raises many questions about the avenues of adjustment and stabilization that will remain available to the member countries of the EU if they renounce their monetary independence. Yet as open economies, these countries can expect a lot of stabilizing movements in imports. The stabilizing effects from this source should heighten with greater integration of capital markets. In addition, the traditional automatic stabilizers of government budgets are especially important for Europe. We have seen that European countries can expect these stabilizers to outperform the automatic stabilization in the U.S. resulting from fiscal federalism. Even if higher factor mobility, capital market integration and fiscal discipline may attenuate the previous stabilizing forces in the EMU in some respects, their basic significance will surely remain. Furthermore, there

can be no pretense that flexible exchange rates grease the wheels of international trade on a steady basis. We know that a random walk explains exchange rates better than any economic model over limited horizons (see Meese (1990)). If so, flexible exchange rates only create noise in the short run, and giving up *continuity* of exchange-rate movement cannot be costly as such. Any relevant sacrifice must stem from the lost ability to decide large changes in the nominal exchange rate every now and then.

In short, the doubts about the ability of the EMU to cope with shocks must center around adjustment rather than stabilization, permanent rather than temporary shocks. Yet even there, the problems are far from obvious. Goods prices certainly adjust in the long run. So far as we know, the price mechanism works in international markets, no worse for European interests than others'. It is also widely recognized that separate national monies are not really the answer to the rigidity of European real wages. Quite the contrary, these separate monies may induce excessive wage bargains because of expectations of monetary accommodation, and therefore a single money could lead to greater wage restraint and wage competition.

Ultimately, the concern about adjustment in Europe always brings us face-to-face with the question of the geographical mobility of European labor. Admittedly, this mobility is low. Yet geographical labor movement is a sluggish process even in the U.S. In fact, the slow operation of this mechanism lies at the heart of the conflicting evidence about adjustment in Europe and the U.S. As we saw in the previous section, labor-market adjustment occurs much faster in the U.S. than Europe at the national level but more slowly at the regional one. The grinding pace of regional labor movement may largely explain the difference. When a permanent shock hits the aggregate demand for labor in the U.S., the bulk of the adjustment in employment at the national level evidently occurs within five years, while the geographical movement of labor to correct geographical imbalances persists at least a decade. By contrast, in Europe, where the slow-moving process of geographical labor migration has little role, the regional adjustment happens far more quickly—indeed within five years—while the aggregate adjustment takes longer.

But what does this all mean about the case for the EMU? I have grave difficulty understanding the view that the low geographical mobility of labor in the EU argues against the EMU. The issue is adjustment, not stabilization. If labor-market adjustment is very slow in

Europe and might be faster with greater geographical labor mobility, how can Europeans alleviate the problem through monetary policy? All that independent monetary policy can do about labor adjustment is to stabilize aggregate demand in general and thereby help to keep people employed where they are; but this also lengthens the adjustment process, which is already very long. If geographical labor mobility was greater and consequently aggregate labor-market adjustment took place faster, maybe monetary policy would have more scope for smoothing the adjustment at the cost of lengthening the process. However, this would mean the opposite: that greater labor mobility would raise the value of independent monetary policy. Adding to the quandary is the fact that labor mobility does play an important role in European adjustment to permanent shocks, as we can judge from the compositional shifts in European employment over time. The whole emphasis on *geographical* movements of labor in connection with the EMU has never been properly explained.

5.2. The risks

The critics of the EMU do have a strong argument, however, regarding the risks. The expected value of keeping an independent monetary policy may be close to zero, but there will be times when possessing the tool would help. Big shocks do occur. Whether we take the example of the African franc zone in the middle 1980s, Massachusetts in the late 1980s, or German unification in 1990, the case for the emergency value of an exchange-rate change looks impressive.

Indeed, the big shocks often come from unlikely sources. Massachusetts and California, two oft-cited examples of U.S. states which recently suffered sharp recessions, would probably fit into most measures of a U.S. "core," and the big, atypical shocks that have hit Western Europe over recent decades have not mainly befallen the periphery, but also places such as Germany and the Benelux. So far as the risks are concerned, therefore, we can only take moderate comfort in indicators of high similitude and symmetry. Such indices may help in defining optimal groupings of countries for membership in a monetary union, since we can only base those judgments on broad structural characteristics and large samples over significant periods. But the indices cannot give us much confidence in the absence of major future shocks of the most problematic kind.

To make matters worse, monetary union could even increase the incidence of asymmetric shocks, as Krugman (1991) has maintained. The European Commission takes the opposite view in *One Market, One Money* and proposes that the EMU, along with economic integration in general, would tend to lower the risks of monetary union by promoting greater intra-industry trade and thereby greater similarity among the members. Yet Krugman points out rightly that economies of scale, lower transport costs and external benefits of clustering by firms in an industry could encourage greater geographical concentration under the EMU. In support of his case, he stresses the greater geographical concentration of the automotive, aviation, defense, and certain electronics industries in the U.S. as opposed to Europe (de la Dehesa and Krugman (1993) contains a summary). We have seen that Bayoumi and Prasad (1995) qualify Krugman's thesis significantly by showing that Europe may be more specialized than the U.S. in certain areas outside of manufacturing, such as retail trade and finance. But the issue is open to debate. It could be, for example, that the zones where the EMU would encourage greater concentration in accordance with Krugman, such as primary goods and manufacturing, are more subject to worldwide conditions and external shocks than those where the EMU would promote less concentration. I am also impressed by earlier indications above that some of the smaller European countries are more diversified than they might be expected to remain in a fully integrated Europe.

5.3. The emergency value of the exchange-rate instrument

What nevertheless needs stressing in connection with the emergency value of the exchange-rate instrument is the well-known problem of time consistency. Any country experiencing a major adverse shock after a long period of exchange-rate stability will appear in a favorable position to engage in a successful devaluation. Yet let that opportunity be seized and the ability to repeat the operation may evaporate. The effectiveness of monetary policy generally depends on contracts holding money prices and wages fixed for a significant duration. Any surprise movement in the exchange rate or exit from a monetary union may cause such contracts to wane and correspondingly reduce the future ability of monetary policy to improve real performance. Is it worth it? The question remains.

The experiences of Italy, Spain, and the UK following the crisis of September 1992 in the EMS should be read in this light. In the two

years following the crisis, the Italian lira depreciated over 20 percent and the Spanish peseta and British pound around 10 percent relative to the other currencies in the EU. Furthermore, in all three cases, real depreciation exceeded the nominal one, so that the performance of domestic inflation did not offset but even contributed to the real depreciation (see Pisani-Ferry, 1994). In addition, net exports increased sizeably in Italy and Spain in 1993 (by 4.6 percent of GDP in Italy, 2.9 percent in Spain) though not in the UK.

But the circumstances could hardly have been more favorable. Exchange-rate stability had prevailed in the EMS between the realignment of January 1987 and the Danish referendum of June 1992. Rose and Svensson (1994) have shown that the market did not anticipate the crisis in the EMS even a couple of months earlier. The Italian case is particularly notable. Wage indexation was suspended in July 1992 and then again in July 1993, despite the intervening depreciation of the lira. In addition, major fiscal reform succeeded in nearly stabilizing the ratio of government debt to GDP in 1993 as well as in 1994. Those are not the typical Italian responses to devaluation.[19] Thus, granted that the experiences of Italy, Spain, and the UK illustrate the value of independent monetary policy at a certain juncture, what conclusion can we draw about the general choice of a regime?

5.4. Insurance

The need to contemplate large shocks in the EMU should probably lead us to pay particularly close attention to insurance. In this regard, fiscal federalism comes back into view, but for a different reason than before: not because of any scarcity of adjustment mechanisms but on strictly political grounds. A country member faced with a large, asymmetric shock may be prone to regard its surrender of independent monetary policy as a mistake, especially in the early years of the system. Some EC-wide transfer mechanism would diminish the threat of division and promote solidarity.

Interestingly enough, fiscal federalism has never arisen for such reason. Two major causes of fiscal federalism in the past have been the general increase in the role of government spending since World War II and the advent of unemployment compensation. A third reason can only be viewed as paradoxical: namely, the concern with dis-

[19] For a general discussion of the British, Italian, and Spanish experiences since the depreciations of September 1992 and after, see Annex 1 of Gros (1996).

couraging regional mobility of labor. Courchene (1993) observes that fiscal federalism began to blossom in Canada in the prosperous 1950s and 1960s in order to "accommodat[e] the desires of the Atlantic provinces" (Newfoundland, Nova Scotia, New Brunswick, Prince Edward Island, and Quebec) and "to stem potential outmigration" (p. 130). Germany's handling of unification obviously constitutes another prime example of the massive use of transfer payments, together with excessive wages, in order to prevent a flow of workers from one part of a country to another. The transfers from the Italian North to the Mezzogiorno probably largely bear a similar interpretation. Wildasin (1995) provides an interesting theoretical underpinning for the use of transfer payments to protect property values against the threat of immigration. If this last inducement to fiscal federalism is the essential one, then the EU probably need not worry. But as previously suggested, there are good reasons for the EU to take a different attitude.

Three points should be made about the potential introduction of fiscal federalism in EMU:

1. The cost of an appropriate insurance system need not be high. If modeled after the German system of direct transfers between *länder* or *finanzausgleich*, a fairly moderate fund will suffice. For example, a small fraction of 1 percent of the GDP of any 14 of the members of the EU will replace a full percent of GDP in the 15th, even if it be the largest. One percent of GDP will cover a good portion of a hefty shock. This level would have represented one-sixth of the enormous shock to aggregate demand that was suffered by Finland and Sweden in the early 1990s. That is pretty good by the U.S. standards that are usually invoked.
2. Any desire to adhere strictly to principles of insurance will cause grave problems. All existing mechanisms of regional insurance within countries give rise to some persistent redistribution in a particular direction. Attempts to avoid this feature would require highly complicated programs, resting on sophisticated econometric techniques, which will have no political appeal (Mélitz and Vori, 1993; von Hagen and Hammond, 1995).
3. As Courchene (1993) and others properly warn, moral hazard is a serious problem. This is even more true if the basic purpose of fiscal federalism is to improve the working of a single money, as in this case, insurance payments must sometimes go to the rich, if only to mollify them. For that reason, perhaps the automatic fea-

tures of present programs are not even important. A political mechanism that requires a vote might be better, since the mechanism would then come into operation exclusively when the disturbances are large and the victim's innocence is plain.

6. Conclusion

According to one popular view, the EMU only makes sense as a part of a wider project of political integration. Another oft-encountered opinion maintains that the basic economic argument for the EMU comes from the absence of any stable middle ground between a single money and flexible exchange rates. In a choice between the two, a single money is better. A third position, easily wedded to the last one but not necessarily the first, argues that the case for the EMU rests on the difficulty of achieving a single market for goods and services with many monies. On my reading of the evidence, the economic case for the EMU stands by itself. The project can be recommended to the risk-neutral politician. The benefits are clear, largely resembling those for uniform weights and measures. No matter how frequently quoted on the subject, Mill still rings true when he deplores the "barbarism" of "most civilized nations" who "assert their nationality by having, to their own inconvenience and that of their neighbors, a peculiar currency of their own" (1848, Book III, ch. XX).

As for the costs of surrendering monetary independence, these are vague. One can give the opposite impression with well-chosen examples and formal optimization exercises. But general empirical evaluations based on long stretches of historical data almost invariably point to the inconclusive presence of non-zero costs in European samples. The probabilities of losses are roughly matched by probabilities of gains. The evidence will only clearly support the case against the EMU on the basis of a substantial degree of risk aversion. It is true that individual countries will likely encounter junctures where they would be better off with their own money over some limited time horizon. Furthermore, in an EMU consisting of as many as 15 countries, there might even be frequently at least one of them in such a situation. Insurance therefore requires serious consideration. Insurance is what the economic case against the EMU is all about.

Appendix

The indicators of asymmetry in Table 2[20]

This appendix explains the construction of the ratios of asymmetric to symmetric shocks reported in Table 2. The relevant data are annual; they cover 1960 to 1995 inclusively; and they come from the OECD database.

(a) The method of sums and differences

In order to apply the method of sums and differences, the first step consists of converting all real GDP figures into dollars through the use of a moving average of the dollar exchange rate for the current year and the two preceding years (except in the case of the first two observations, which depend exclusively on the dollar exchange rates in 1960 and 1961). The reference value for foreign output is the sum of all individual foreign values in dollars. However, this sum is adjusted so that its mean always equals that of the output of the country itself. More specifically, let Y_i be the dollar value of real GDP of country i. The corresponding reference value for country i, Z_i, obtains as follows:

$$Z_i = k_i \sum_{j \neq i} Y_j \qquad \text{where } k_i = \overline{Y}_i \,/\, \sum_{j \neq i} \overline{Y}_j$$

The next step consists of finding disturbances to Y_i and Z_i based on autoregressions using a constant and a time trend: that is,

$$Y_{i,t} = a_{i,0} + a_{i,1} Y_{i,t-1} + a_{i,2} t + u_{i,t}$$
$$Z_{i,t} = b_{i,0} + b_{i,1} Z_{i,t-1} + b_{i,2} t + v_{i,t}$$

The sums and the differences are then calculated on the basis of the residuals $u_{i,t}$ and $v_{i,t}$. The indicator of asymmetry reported in Table 2 represents the variance of the differences, $u_{i,t} - v_{i,t}$, divided by the variance of the sums, $u_{i,t} + v_{i,t}$.

[20] *I would like to thank Ludovic Mercier for excellent research assistance in preparing the tests reported in this appendix.*

(b) The regression method

The regression method uses the pooled data of the growth rates of real GDP over all 18 of the countries over the years 1961-95 inclusively. The analysis starts with the model:

$$(1)\ \Delta\ln(y_{i,t}) = \alpha(i) + \beta(t) + \varepsilon_{i,t} \qquad \forall t \in [1,35]$$

where $\Delta\ln(y_{i,t})$ is the growth rate of real GDP (y) of country i at time t. The term $\alpha(i)$ is a constant which is specific to each country i (resulting in 18 constants). The term $\beta(t)$ is a fixed effect associated with time t which is common to all countries. Hence, there are 35 different $\beta(t)$ coefficients, each one associated with a dummy variable for a separate period. The $\varepsilon_{i,t}$ terms are idiosyncratic disturbances pertaining to a separate country per period.

The preceding model, as such, cannot be identified. To do so, similar efforts usually set all the coefficients equal to one for a particular country or industry, as the case may be (see, for example, Stockman (1988) and Bayoumi and Prasad (1995)). Since all the countries in our sample are European, repeating this practice here would mean interpreting all of the β coefficients as common differences between 17 of the countries and an 18th. The β coefficients would therefore signify asymmetric effects in a fundamental sense. For this reason, I proceeded differently. Instead, I set $\beta(0)$, or β in 1961, as equal to zero for all countries. In this case, the β coefficients for all time periods are common differences among the countries with respect to the first period.

But equation (1) could not be retained because of a Durbin-Watson of only 1.54, too low for confidence in the hypothesis of no autocorrelation in the ε terms. The following alternative model therefore served instead:

$$(2)\ \Delta\ln(y_{i,t}) = \alpha(i) + \lambda(i)\Delta\ln(y_{i,t-1}) + \beta(t) + \varepsilon_{i,t} \qquad \forall t \in [1,34]$$

In addition, the tests initially included Turkey in the sample, but when they did, the countries were not growing along convergent paths. Once Turkey was omitted, though, the joint F test for the hypothesis of convergent growth, $\alpha(i) = \bar{\alpha}$, could be accepted at the

18 percent level (F=1.31), and just as significantly, the other test statistics improved markedly.

Table 2 reports results based on model (2) for all 18 countries in the full sample period, 1962-95, and for a shorter one, 1962-89. In both cases, the model yields satisfactory results. For the full sample period, the Durbin-Watson equals 1.87, the R^2 is 0.79, the β values are significant (the F statistic in a joint test of the null hypothesis $\beta(t) = 0\ \forall t$, of 11.22, permits unambiguous rejection of the hypothesis), and the F statistic for the model as a whole of 30.38 is highly significant. In the case of the shorter sample period, the corresponding statistics are DW=1.85, R^2= 0.81, F=8.64 for $\beta(t) = 0$, and F=30.63 for the model as a whole. The measure of the importance of the asymmetric shocks in the table consists of the variance of the disturbances ε, while that of the importance of the common or symmetric shocks consists of the variance of the β coefficients. Table 2 reports the ratios $var(\varepsilon_i)/var(\beta)$.

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