

On the Euro: Impacts on Members and Non-Members

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It may be late in the game to debate the merits of EMU for its members. But I begin with a review of the pros and cons. The UK, Sweden and others have yet to decide whether to join, so for them the evaluation is still relevant. The second half of these notes will turn to the implications of the euro as a new international currency. Impacts on countries outside EMU are discussed in addition to countries inside.

Impact of EMU Per Se on the Members

The two big advantages of fixing the exchange rate, for any country, are:

- (1) to reduce transactions costs and exchange rate risk, which can discourage trade and investment, and
- (2) to provide a credible nominal anchor for monetary policy.

The big advantage of a floating exchange rate, on the other hand, is the ability to pursue an independent monetary policy.¹

Which factors are likely to dominate, the advantages of fixed exchange rates or the advantages of floating? The answer must depend, in large part, on characteristics of the country in question. There is no one right answer for all countries or all times. Many of the country characteristics that are most important in this context are closely related to the size and openness of the country. This observation brings us to the theory of the Optimum Currency Area.

¹ To be sure, other factors enter as well. Another advantage of fixed exchange rates, for example, is that they prevent competitive depreciation or competitive appreciation. Another advantage of having an independent currency is that the government retains seignorage. Most of the important factors, however, can be lumped into the major arguments presented in the text.

Definition of an Optimum Currency Area

Countries that are highly integrated with each other, with respect to trade and other economic relationships, are more likely to constitute an optimum currency area. We define an optimum currency area as a region for which it is optimal to have its own currency and its own monetary policy.² This definition can be given some more content by assuming that smaller units tend to be more open and integrated than larger units. Then an OCA can be defined as *a region that is neither so small and open that it would be better off pegging its currency to a neighbor, nor so large that it would be better off splitting into subregions with different currencies.*³

Why does the OCA criterion depend on openness? The advantages of fixed exchange rates increase with the degree of economic integration, while the advantages of flexible exchange rates diminish. Recall the two big advantages of fixing the exchange rate that we just identified: (1) to reduce transactions costs and exchange rate risk that can discourage trade and investment, and (2) to provide a credible nominal anchor for monetary policy. If traded goods constitute a large proportion of the economy, then exchange rate uncertainty is a more serious issue for the country in the aggregate. Such an economy may be too small and too open to have an independently floating currency. At the same time, because fixing the exchange rate in such a country goes further toward fixing the entire price level, an exchange rate peg is more likely to be credible, and thus more likely to succeed in reducing inflationary expectations.⁴

Furthermore, the chief advantage of a floating exchange rate, the ability to pursue an independent monetary policy, is in many ways weaker for an economy that is highly integrated with its neighbors. This is because there are ways that such a country or region can cope with an adverse shock even in the absence of discretionary changes in macroeconomic policy.

The trade criterion

Consider first, as the criterion for openness, the marginal propensity to import. Variability in

² Stretching the definition of integration even further, another kind of integration, more political in nature, can help reduce the need for monetary independence: to the extent that domestic residents have economic priorities, especially on fighting inflation versus unemployment, that are similar to those of their neighbors they will be less need for a differentiated response to common shocks. (Corden, 1972; and Alesina and Grilli, 1991.) Finally, to the extent that individuals think of themselves as citizens of Europe more than citizens of their own county, they may be willing on political grounds to forego discretionary monetary responses even to disturbances that are so large that a national policy response would be in their economic advantage.

³ The classic references are Mundell (1961) and McKinnon (1963). A recent survey is Tavlas (1992). The issues are also reviewed by Bayoumi and Eichengreen (1994).

⁴ Romer (1993).

output under a fixed exchange rate is relatively low when the marginal propensity to import is high. Openness can act as an automatic stabilizer.

The labor mobility criterion

Consider next, as the criterion of openness the ease of labor movement between the country in question and its neighbors. If the economy is highly integrated with its neighbors by this criterion, then workers may be able to respond to a local recession by moving across the border to get jobs, so there is less need for a local monetary expansion or devaluation.

The symmetry of shocks criterion

Of course the neighbor may be in recession too. *To the extent that shocks to the two economies are correlated, however, monetary independence is not needed in any case: the two can share a monetary expansion in tandem.* There is less need for a flexible exchange rate between them to accommodate differences.

The fiscal transfer criterion

Consider, finally, a rather special kind of integration: the existence of a federal fiscal system to transfer funds to regions that suffer adverse shocks. The existence of such a system, like the existence of high labor mobility or high correlation of shocks, makes monetary independence less necessary.

The EU vs. the US, judged by the four OCA criteria

We have just seen that regional units are more likely to benefit, on net, from joining together to form a monetary union if: (1) they trade a lot with each other, (2) there is high degree of labor mobility among them, (3) the economic shocks they face are highly correlated, or (4) there exists a federal fiscal system to transfer funds to regions that suffer adverse shocks.

Each of these criteria can be quantified, but it is very difficult to know what is the critical level of integration at which the advantages of belonging to a currency area outweigh the disadvantages. The states of the United States constitute a possible standard of comparison. It seems quite clear that the degree of openness of the states, and the degree of economic integration among them, are sufficiently high to justify their use of a common currency. How do the members of the European Union compare to the states in this regard? US states appear to be more open than European countries, by both the trade and labor mobility criteria. It appears that when an adverse shock hits a region of the US such as New England or the oil states of the South, out migration of workers is the most important mechanism

whereby unemployment rates and wages are eventually re-equilibrated across regions.⁵

Labor mobility among European countries is much lower than in the United States. In some parts, the geographical radius within which many people live their entire lives is smaller than the distance over which Los Angelenos commute to work on a daily basis.⁶ Americans are three to two times as likely to move between states as are Germans to move between their lander, or the French to move between their departements.⁷ Europeans are presumably even less inclined to move across national boundaries within the European Union than they are to move within their own countries. Thus, by the labor mobility criterion, European countries are less well-suited to a common currency than are American states.⁸

⁵ Blanchard and Katz (1992).

⁶ While economists and demographers may have their own ways of measuring labor mobility, anthropologists/archaeologists recently produced an extreme illustration of low mobility in the U.K.. Excavation near the town of Cheddar, England, uncovered a 6,000-year old skeleton. Scientists, having obtained a sample of DNA from "Cheddar Man," set off to see if they could find a match among any of the residents of the nearby town. Before long, they were able to verify that a local schoolteacher was a direct relation [perhaps a direct descendant of a sibling of Cheddar Man]. The schoolteacher lived only one-half mile from his forebearer's cave. Evidently, in this one English family at least, successive generations do not like to move far from their ancestral home.

⁷ Eichengreen, 1993.

⁸ Decressin, Jorg, and Antonio Fatas, 1995.

The other two criteria are also better satisfied within the United States than within Europe. Disturbances across U.S. regions have a relatively high correlation, compared to members of the European Union.⁹

When disparities in income do arise in the United States, federal fiscal policy helps to narrow them. One recent estimate suggests that when a region's per capita income falls by one dollar, the final reduction in its disposable income is only 70 cents. The difference, a 30 per cent federal cushioning effect, includes both an automatic decrease in federal tax receipts plus an automatic increase in unemployment compensation and other transfers. The cushioning effect has been estimated at 17 percent in the case of Canada. European countries have greater scope for domestic fiscal stabilization than do American states (and will retain at least some of this scope despite the fiscal constraints that the EMU process is imposing on them). Furthermore there are some cross-country fiscal transfer mechanisms. Nevertheless, neither the fiscal transfer mechanisms that are already in place within the European Union nor those that are contemplated under EMU -- so-called "structural funds" -- are as large as those in the U.S. [or Canadian] federal fiscal system.¹⁰

⁹ Bayoumi and Eichengreen (1993).

¹⁰ We are using Bayoumi and Masson, rather than earlier estimates by Sala-I-Martin and Sachs (1991) or lower estimates are suggested by von Hagen.

Judged by these optimum currency area criteria, the European Union is not as good a candidate for a monetary union as is the United States. But the extent of European integration is increasing over time, partly as a result of such measures as the removal of barriers to trade and labor mobility in 1992. Even if EU members such as Italy and the UK in 1992 did not satisfy the criteria for joining the optimum currency area in the 1990s, perhaps they will in the future. This point is especially acute for new members such as Sweden. The effect of EU accession in 1995 will be to promote Sweden's trade with other European countries. Statistical estimates using the gravity model of bilateral trade suggest that membership in the EU increases trade with its members by roughly 50 percent or more.¹¹ Thus it is more likely that Sweden will satisfy the OCA criterion in the future than in the past.

The endogeneity of the income correlation criterion

What about the other parameter, the degree of income correlation among members? We come now to a key point. *Income correlation surely depends on trade integration.*

Our hypothesis is that this relationship is positive: the more Sweden trades with the EU, the more will Swedish income be correlated with EU income. We think it evident that the incomes of U.S. states, for example, are highly correlated with each other because their economies are highly integrated. The result would be immediate in a demand-driven model (where the correlation of income depends in a simple way on the marginal propensities of the two countries to import from each other), but it could also follow in a variety of other models (e.g., productivity shocks spilling over via trade).

Now consider what happens when Sweden decides to join EMU (European Economic and Monetary Union). The elimination of exchange rate uncertainty and currency transaction costs stimulates trade with other EU members. Integration and correlation rise further. (Based on the statistical evidence, we believe that the stimulus to trade from stabilizing the exchange rate is rather small, though positive.¹² The advantages to eliminating different currencies

¹¹ The Frankel and Wei papers cited above provide estimates, and other citations to the literature.

¹² Small effects are estimated, for example, in Frankel and Wei (1995a,b; 1997)

altogether probably adds something, beyond the reduction in exchange rate variability to zero.)

To identify the effect of bilateral trade patterns on income correlations, we need exogenous determinants of bilateral trade patterns. Rose and I (1998) have used the exogenous variable of the gravity model: bilateral distance, common border dummy, common language dummy, the product of sizes, the product of incomes per capita. In this way we hope to see whether an exogenous increase in trade between two countries raises or lowers the correlation between their incomes. Our finding is that an increase in trade raises the correlation. Thus countries are more likely to satisfy the OCA criterion *ex post* than *ex ante*.

Impact of EMU on Other Countries

So much for the implications of monetary integration on members of the euro area. What about the implications for other countries?

Impact on other European countries

If the UK, Sweden or others decide to enter into a transition to membership in EMU, there is always the danger that shocks will occur in the interim that result in exchange rate crises of the sort experienced in 1992-93 (or East Asia 1997). This would be one manifestation of imperfect qualifications under the OCA criteria.

Impact on the rest of the world

Perhaps, to the extent EMU reduces transactions costs for intra-European trade, it will engender some trade-diversion at the expense of other trading partners. But, overall, I see grounds for hope that there will be enough trade creation so that other countries are not harmed economically. This is even leaving aside the political advantages from having a stable and integrated European continent. EMU is an inspiring adventure/achievement/experiment. Like earlier stages of European integration, it was born out of a desire to banish permanently the possibility of another European war and as such is to be applauded.

Impact on the United States

The main effect is that, to whatever extent EMU contributes to European prosperity, it will also contribute to American prosperity, through trade and other channels. This is true in particular if European growth is led by domestic demand. U.S. firms should benefit from savings in transactions costs, perhaps even more than European firms because they are already used to operating in large markets.

Will the Euro Challenge the Dollar as International Currency?

While the “euro” has become shorthand in Europe for the advent of the monetary union, it is important to distinguish the question of the international currency role of the euro from the question of the dollar/euro exchange rate or other aspects of EMU.

What is an international currency?

An international currency is one that is used outside its home country. This includes uses by countries’ monetary authorities, as well as in the private sector.

Official uses of international currencies include:

- the pegging of minor currencies, and
- the holding of foreign exchange reserves by central banks. (This function is called "reserve currency" status.)

Private-sector uses of international currencies include:

- invoicing and payment for imports and exports,
- denominating financial transactions, and
- a medium for foreign exchange trading. (The international medium-of-exchange function is called "vehicle currency" status.)

How does the dollar currently rank against other international currencies?

Most measures show a gradual decline in international use of the dollar. Reserve currency use, perhaps the most important measure, is shown in Figure 1. The dollar's share of central bank reserve holdings declined from 76.1 % in 1973, to 56.0 % in 1990. Central banks gradually shifted their portfolio shares into marks and yen. But the dollar's share in reserve holdings has been relatively flat in the 1990s, even rising.

Other major measures of international currency status are shown in Table 1. Overall, they tend to show the same thing: the dollar still on top, despite a gradual decline in its use versus the mark and yen over the last twenty years. The dollar is still more important than its three or four rivals combined.

- The first column reports the popularity of major currencies among smaller countries choosing a peg for their currencies. It is still the case that no currencies anywhere are pegged to the yen. Three currencies [Estonia, Bulgaria, Bosnia] are now pegged to the mark, however. Elsewhere (Africa) the French franc is still the most common choice as a peg [29 per cent of peggers], after the dollar [39 per cent]. If one broadens the test to include countries that peg to a weighted basket, whether tightly or loosely, one again gets the conclusion that the dollar remains dominant. [Even among East Asian countries, where

the yen occasionally has a statistically significant weight, the weight placed on the dollar is always far higher.^{13]}

¹³ Frankel and Wei (1993).

- In the past, almost all trades in the foreign exchange market involved the dollar, as the currency either bought or sold. These days, the firm would be a bit more likely than before to be able to go directly from pounds to marks.¹⁴ But as of April 1998, 87 percent of foreign exchange transactions still involved the dollar. The figures are reported in the third column of the tables (divided by two so that the total does not exceed 100 per cent).
- The various measures of use of currencies to denominate private international financial transactions -- loans, bonds, and deposits -- still show the dollar as the dominant currency.
- Figures on the use of international currencies as substitutes in local cash transactions, are not generally available. The two leaders are certainly the dollar, for which internationally-circulating cash has been estimated by the Fed at 60 percent of U.S. currency outstanding, and the mark, for which international circulation has been estimated by the Bundesbank at 35-40 percent of German currency outstanding. The implication is that dollars circulating abroad are more than four times greater than marks.

What are the determinants of international currency status?

Will the dollar in the future maintain its global role? There are four major sorts of conditions that determine whether a currency is an international currency.¹⁵

(1) Patterns of output and trade. The currency of a country that has a large share in international output, trade and finance has a natural advantage. The U.S. economy is still the world's largest, in terms of output and trade, and will be larger than the 11 economies of euroland aggregated together. If the United Kingdom and the rest of the four non-member EU countries join in the future, however, the area will be virtually equal in economic size to the United States.

[If the measure of being a vehicle currency is how often it is used in the invoicing and financing of

¹⁴ Bank of England (1992) or Bank for International Settlements (1993).

¹⁵ Bergsten (1975), Tavlas and Ozeki (1991), Frankel (1992), and Hale (1995).

international trade, then other aspects of the pattern of trade may also be relevant. The fact that much of Japan's imports are oil and other raw materials and that much of its exports go to the Western Hemisphere, for example, helps explain why a disproportionately small share of trade is invoiced in yen as opposed to dollars. Raw materials still tend heavily to be priced in dollars.]

(2) History. There is a strong inertial bias, in favor of using whatever currency has been the vehicle currency in the past. An individual (exporter, importer, borrower, lender, or currency trader) is more likely to use a given currency in his or her transactions if everyone else is doing so. For this reason, the world's choice of international currency is characterized by multiple stable equilibria.¹⁶ The pound remained an important international currency even after the United Kingdom lost its position as an economic superpower early in the century. In the present context, the inertial bias favors the continued central role of the dollar.

(3) The country's financial markets. Capital and money markets must be not only open and free of controls, but also well-developed, deep and liquid. The large financial marketplaces of New York and London clearly benefit the dollar and pound relative to the deutschemark and yen.

(4) Confidence in the value of the currency. Even if a key currency were used only as a unit of account, a necessary qualification would be that its value not fluctuate erratically. As it is, a key currency is also used as a form in which to hold assets (firms hold working balances of the currencies in which they invoice, investors hold bonds issued internationally, and central banks hold currency reserves). Here confidence that the value of the currency will be stable, and particularly that it will not be inflated away in the future, is critical.

The monetary authorities in Japan, Germany and Switzerland, in the 1970s established a better track record of low inflation than did the United States, which helped their bids for international currency status. Given the good U.S. inflation performance more recently, this is no longer much of a concern.

A more important negative for the dollar is the fact that the United States is now a large-scale debtor country. Indeed, 1997 was the first year when the country actually paid out more in interest, dividends, and repatriated profits to foreigners, on their past U.S. investments, than it received on its own past investments abroad. Even if the Federal Reserve never succumbs to the temptations or pressures to inflate away the U.S. debt, the continuing U.S. current account deficit is always a possible source of downward pressure on the dollar. Such fears work to make dollars less attractive than

¹⁶ Krugman (1984).

otherwise.¹⁷

What is the prognosis for the dollar and the euro?

In light of these desiderata for a would-be international currency, is it likely that the euro will rival the dollar as leading international currency? EMU will automatically give the new currency a share roughly equal to the sum of those currently held by the ecu, DM, french franc, and other EMS currencies, by most measures. [By the measure of currency pegging, the euro will have a greater share, because all 11 EMU members will be added in. By the measure of reserve holdings, it will have a smaller share, because members' holdings of each others currencies will disappear. The same is true of foreign exchange trading.] Subsequently, the euro's share will probably gradually rise, to move in the direction of "euroland"'s share of output, which is similar to the size of the U.S. economy.

The odds are against the euro rapidly supplanting the dollar as the world's premier currency. The dollar will probably continue to be the world's favorite currency for holding reserves, pegging minor currencies, invoicing imports and exports, and denominating bonds and lending. It is not that the dollar is ideally suited for this role. At least one characteristic mars its appeal: The United States is a debtor country with a large current account deficit. But an international currency is one that people use because everyone else is using it. Two of the four determinants of reserve currency status -- developed financial markets and historical inertia -- support the dollar over the euro. The third, economic size, is a tie. The fourth determinant could in principle disqualify the dollar, if the Federal Reserve launched a high-inflation strategy, but this is unlikely to happen. The new European Central Bank, for its part, will have to "earn its spurs."

Over the period 1970-1992, U.S. GDP fell from 24 per cent of Gross World Product, evaluated at PPP rates, to 20 per cent. It is possible that one can explain much of the downward trend in the dollar's share of world reserve holdings over the last 25 years, and the upward trends in the yen and mark shares, by the falling share of U.S. GDP in the world economy, and the rising share of the

¹⁷ A contrary viewpoint is possible. As argued by Triffin, *only if a country like the United States does run a deficit* will other countries be able to run a surplus and thereby earn the dollars they need to match reserve growth with real economic growth.

Japanese and German GDPs. A careful econometric study of the determinants of central bank reserve holdings is beyond the scope of this article. But an analysis of the role of relative growth rates suggests that the currency shares adjust only very slowly.

Is it good or bad for the euro to rival the dollar as lead international currency?

Does it matter whether the dollar remains the leading international currency? Of course central banks' reserve currency holdings have important implications for the determination of the exchange rate. But this is another question. What about the global role of the dollar per se?

Advantages to the home country

One can think of four advantages to a country of having its currency used internationally.

(1) Convenience for residents. It is certainly more convenient for a country's exporters, importers, borrowers and lenders to be able to deal in its own currency than foreign currencies. The global use of the dollar, as with the global use of the English language, is a natural advantage that American businessmen tend to take for granted.¹⁸

(2) More business for the country's banks and other financial institutions. There need be no firm connection from the currency in which banking is conducted to the nationality of the banks (nor from the nationalities of the savers and borrowers to the nationality of the intermediating bank). British banks, for example, continued to do well in the Eurodollar market after the pound lost its international role. Nevertheless, it stands to reason that U.S. banks have a comparative advantage at dealing in dollars. Only U.S. banks have access to the safety net provided by U.S. regulatory authorities (access to the discount window, and so forth).

(3) Seignorage. This is thought by some to be perhaps the most important advantage of having other countries hold one's currency. They must give up real goods and services, or ownership of the real capital stock, in order to add to the currency balances that they use. Just as American Express reaps profits whenever people hold its travelers' checks, which they are willing to do without receiving interest, so the United States profits whenever people in Argentina or Russia hold dollars that do not pay interest. Wherever hyperinflation or social disorder undermine the public's faith in the local currency, the American dollar is the preferred alternative. (The drug trade and other illegal activities is another source of demand, of course.)

[There is an another (smaller) component of seignorage in addition to the currency component.

¹⁸ One had to wonder what the reaction of American manufacturers and farmers would be in 1984 when Treasury Secretary Don Regan berated the members of the Keidanren for paying for their imports in dollars rather than yen.

Most foreign central banks and other investors hold their dollars in the form of interest-paying treasury bills. To the extent that the reserve currency role of the dollar allows the U.S. Treasury to pay a lower interest rate on its liabilities than must other borrowers, the difference is a further source of seignorage.¹⁹ Some argue that the U.S. would have a harder time financing its current account deficit if the dollar were not an internationally accepted reserve currency.]

(4) Political power and prestige. The benefits of "power and prestige" are decidedly nebulous. Nevertheless, the loss of key currency status and the loss of international creditor status have sometimes been associated, along with such non-economic factors as the loss of colonies and military power, in discussions of the historical decline of great powers.

Disadvantages to the home country

One can think of two disadvantages from the viewpoint of a key-currency country. They explain why Japan, Germany and Switzerland, have in the past been reluctant to have its currency held and used widely.

(1) Larger fluctuations in demand for the currency. It is not automatically clear that having one's currency held by a wide variety of people around the world will result in greater variability of demand. Perhaps such instability is more likely to follow from the increase in the degree of capital mobility, than from key currency status per se. In any case, central banks are particularly concerned that internationalization will make it more difficult to control the money stock. This problem need not arise if they do not intervene in the foreign exchange market. But the central bank may view letting fluctuations in demand for the currency be reflected in the exchange rate as being just as undesirable as letting them be reflected in the money supply.

(2) An increase in the average demand for the currency. This is the other side of seignorage. In the 1960s and 1970s, the Japanese and German governments were particularly worried about the possibility that if assets were made available to foreign residents, an inflow of capital would cause the currency to appreciate and render exporters uncompetitive on world markets. In 1998, some

¹⁹ This was the basis of European resentment against the dollar standard and against the U.S. basic balance deficit in the 1960s, to the extent that the European need to acquire dollars was the fundamental origin of that deficit.

Europeans seem to worry that international currency status for the euro might lead to a loss in export competitiveness for European firms.

Impact on the rest of the world.

Which is more efficient for the world monetary system, a single reserve currency, or two, three or more? On the one hand, there are clear efficiencies in having a single international currency. These “network externalities” stem from the reason we have money in the first place -- to avoid a “double coincidence of wants.”

On the other hand, there are some who argue that a multiple-reserve currency system would be more stable than a system that relied on a single currency like the dollar. One rationale for this position would be that when an international currency has no rivals, its home government might be tempted to abuse its responsibility and run deficits at the expense of others. In this view, the existence of a second international currency creates a healthy rivalry that keeps both governments in line.

The introduction of the euro in January 1999 will instantly create an international currency that potentially rivals the dollar. The standard measures of international currency use will show a euro that inherits roughly the roles of its constituent currencies. Subsequently the dollar will probably lose share gradually, as it lost share in the 70s and 80s to the mark and yen. There will be some small associated costs for the US. But from the viewpoint of the United States government, maintaining the international role of the dollar will be just one more reason, on the list of reasons that already exist, to pursue sound macroeconomic policies. There is no reason to expect the euro to surpass the dollar anytime soon, nor for the costs from the US viewpoint to outweigh the substantial political and economic advantages to a successful EMU.

References

Alesina, Alberto, and Vittorio Grilli, 1991, "The European Central Bank: Reshaping Monetary Politics in Europe," in M.Canzoneri, V.Grilli and P.Masson, eds., Establishing a Central Bank: Issues in Europe and Lessons from the US, CEPR, London, Cambridge University Press: Cambridge UK.

Bayoumi, Tamim, and Barry Eichengreen, 1993a, "Shocking Aspects of European Monetary Unification," in F. Giavazzi and F. Torres, eds., The Transition to Economic and Monetary Union in Europe, Cambridge University Press, New York.

Bayoumi, Tamim, and Barry Eichengreen, 1993b, "Is There A Conflict Between EC Enlargement and European Monetary Unification," Greek Economic Review 15, no. 1, Autumn, 131-154.

Bayoumi, Tamim, and Barry Eichengreen, 1993c, "Monetary and Exchange Rate Arrangements for NAFTA," IMF Discussion Paper No. WP/93/20, March.

Bayoumi, Tamim, and Barry Eichengreen, 1994, *One Money or Many? Analyzing the Prospects for Monetary Unification in Various Parts of the World*, Princeton Studies in International Finance no. 76, September, Princeton.

Blanchard, Olivier, and Lawrence Katz, "Regional Evolutions," Brookings Papers on Economic Activity 1992, no.1, 1-61.

Cohen, Daniel, and Charles Wyplosz, 1989, "The European Monetary Union: An Agnostic Evaluation," in R. Bryant, D. Currie, J. Frenkel, P. Masson, and R. Portes, ed. Macroeconomic Policies in an Interdependent World, Washington DC, Brookings, 311-337.

Corden, W. Max, 1972, *Monetary Integration*, Princeton Studies in International Finance, No. 93, International Finance Section, Princeton University, April.

De Grauwe, Paul, and Wim Vanhaverbeke, 1991, "Is Europe an Optimum Currency Area? Evidence from Regional Data," CEPR Discussion Paper No. 555, London, May.

Edison, Hali, and Michael Melvin, 1990, "The Determinants and Implications of the Choice of An Exchange Rate System," in Monetary Policy For a Volatile Global Economy, W. Haraf and T. Willett, eds., American Enterprise Institute, Washington, D.C..

Eichengreen, Barry, 1988, "Real Exchange Rate Behavior Under Alternative International Monetary Regimes: Interwar Evidence," *European Economic Review* 32, 363-371.

Eichengreen, Barry, 1992, "Should the Maastricht Treaty Be Saved?" Princeton Studies in International Finance, No. 74, International Finance Section, Princeton Univ., December.

Frankel, Jeffrey, and Andrew Rose, 1998, "The Endogeneity of the Optimum Currency Area Criterion," The Economic Journal, vol. 108, no. 449, July, 1009-1025.

Frankel, Jeffrey, and Shang-Jin Wei, 1995a, "Emerging Currency Blocs," in The International Monetary System: Its Institutions and its Future, H. Genberg, ed., Springer, Berlin, 111-143.

Frankel, Jeffrey, and Shang-Jin Wei, 1995b, "European Integration and the Regionalization of World Trade and Currencies: The Economics and the Politics" in Monetary and Fiscal Policy in an Integrated Europe, edited by Barry Eichengreen, Jeffrey Frieden, and Jurgen von Hagen, Springer-Verlag Press, New York and Heidelberg.

Frankel, Jeffrey, and Shang-Jin Wei, 1997, "Regionalization of World Trade and Currencies:

Economics and Politics"; in The Regionalization of the World Economy, J. Frankel, editor, University of Chicago Press, Chicago.

Kenen, Peter, 1969, "The Theory of Optimum Currency Areas: An Eclectic View," in R. Mundell and A. Swoboda, eds., Monetary Problems in the International Economy, Chicago: University of Chicago Press.

Krugman, Paul, 1993, "Lessons of Massachusetts for EMU," in F. Giavazzi and F. Torres, eds., The Transition to Economic and Monetary Union in Europe, Cambridge University Press, New York, 241-261.

McKinnon, Ronald, 1963, "Optimum Currency Areas" American Economic Review, 53, September, 717-724.

Mundell, Robert, 1961, "A Theory of Optimum Currency Areas", American Economic Review, November, 509-517.

Romer, David, 1993, "Openness and Inflation: Theory and Evidence," Quarterly Journal of Economics, 108, no.4, November: 869-903.

Sala-i-Martin, Xavier, and Jeffrey Sachs, 1991, "Fiscal Federalism and Optimum Currency Areas" in M. Canzoneri, V. Grilli and P. Masson, eds., Establishing a Central Bank: Issues in Europe and Lessons from the US, CEPR, London, Cambridge University Press: Cambridge UK., 195-219.

Tavlas, George, 1992, "The 'New' Theory of Optimal Currency Areas," International Monetary Fund, Washington, DC.

Table 1
THE IMPORTANCE OF MAJOR CURRENCIES (SHARES IN INTERNATIONAL USE)

	OFFICIAL USE OF CURRENCIES		CURRENCY OF DENOMINATION IN PRIVATE TRANSACTIONS			
	Pegging of minor currencies ²⁰	Foreign exchange reserves held by central banks ²¹	Foreign exchange trading in world markets ²²	Inter-national capital markets ²³	Inter-national trade ²⁴	Cash held outside home country ²⁵
U.S. dollar	.39	.61	.44	.54	.48	.78
Deutsche mark	.06	.13	.15	.11	.16	.22
Japanese yen	.00	.05	.11	.08	.05	NA
pound sterling	.00	.04	.06	.08	} .15	.00
French franc	.29	.01	.03	.06		.00
other EMS currencies	.04	} NA	} .09	NA		.00
ECU ²⁶	.00			.01	.00	.00
Other / un-specified	.22	.11	.15	.12	.16	NA

²⁰ Source: IMF, *International Financial Statistics*. Data pertain to 3/31/98. None of the EMS countries was officially classified as pegging to the deutschemark or ECU. ("Other" includes SDR and South African rand, at .08 and .06 respectively.)

²¹ Source: IMF, *Annual Report* 1998, Table I.2. Data pertain to end-1997. ("Other" includes Swiss franc at .01.)

²² Source: Bank for International Settlements, Basle, 1998. Data pertain to April 1998. All figures

have been divided by 2, so that total adds to 100% even though there are two currencies in each transaction. (“Other” includes Swiss franc at .04.)

²³ Total funds raised in 1996, including international bond issues, medium and long-term syndicated bank loans, and other debt facilities. Source: N. Funke and M. Kennedy, “International Implications of European Economic and Monetary Union,” *Economics Department Working Paper No. 174*, OECD, Paris, 1997.

²⁴ Source: *ibid.* Data pertain to 1992. (“Other EMS currencies” are Italian lira and Dutch guilder.)

²⁵ Data pertain to 1995. Source: Calculated from US and German central banks’ estimates (B. Eichengreen and J. Frankel, “The SDR, Reserve Currencies, and the Future of the International Monetary System,” in The Future of the SDR in Light of Changes in the International Financial System, edited by M. Mussa, J. Boughton, and P. Isard, International Monetary Fund, 1996). Shares of the yen and Swiss franc are set at zero for lack of data, even though they are thought to be greater than that (K. Rogoff, “Large Banknotes: Will the Euro Go Underground?” in Economic Policy, April 1998).

²⁶ From January 1999, the ECU becomes the euro. The mark, French franc, and nine other EU currencies are to be irrevocably fixed to the euro, and to disappear entirely by 2002.