Benefits and Costs of Entering the Eurozone

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Europe's single-currency undertaking is perhaps the boldest attempt ever in which a large and diverse group of sovereign states has attempted to reap the efficiency gains of using a common currency. On January 1, 1999, 11 European Union countries initiated the European Monetary Union by adopting a common currency, the euro, and assigning the formulation of monetary policy to the Governing Council of the European Central Bank, based in Frankfurt. Two years later, Greece became the 12th member of the EMU. In May 2004, 10 additional countries joined the EU and eventually will become members of the EMU.[1] The EMU is the culmination of a process that began in the aftermath of World War II with a range of narrow economic-cooperation agreements, leading to the creation of a common internal market, and, now, to a common central bank and a single currency.

The decision whether to join the EMU is part of a broad economic and political calculus about the advantages and disadvantages of participation in a monetary union. What are the benefits and costs of entering the eurozone? This article addresses that question.

Exchange Rate Regimes and Globalization

In recent years, a large part of the economics profession appears to have become converted to "the hypothesis of the vanishing middle."

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[1]The 10 accession countries are the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. Three countries, Denmark, Sweden, and the United Kingdom, are members of the EU, but have not adopted the euro.

The underlying premise of this hypothesis is that increasing global-
ization has undermined the viability of intermediate exchange rate
regimes, such as adjustable pegs, crawling bands, and target zones
(Eichengreen 2000: 316).[2] What has caused the retreat from the
middle ground?

First, an explosive increase in capital flows has had important im-
plications for the ability to conduct an independent monetary policy.
While the rise in capital flows has increased the potential for inter-
temporal trade, portfolio diversification, and risk sharing, it has made
the operation of soft pegs problematic. This circumstance gave rise to
Cohen's (1993) thesis of the Unholy Trinity: under a system of pegged
exchange rates and free capital mobility, it is not possible to pursue an
independent monetary policy on a sustained basis.[3] Eventually, cur-
rent account disequilibria and changes in reserves will provoke an
attack on the exchange rate. Consequently, economies that wish to
maintain pegged exchange rates will have to relinquish their monetary
policy autonomy or resort to capital controls.

Second, the enormous increase in capital flows has been accom-
panied by abrupt reversals of flows. Whereas the logic of the thesis of
the Unholy Trinity suggests that exchange rate attacks typically origi-
nate in response to current account disequilibria and build up gradu-
ally, in fact, recent speculative attacks have often originated in the
capital account, have been difficult to predict, and have included the
currencies of economies without substantial current account imbal-
ances. Capital-flow reversals have involved a progression of specula-
tive attacks, mostly against pegged exchange rate arrangements, be-
ginning with the currencies participating in the exchange rate mecha-
nism (ERM) of the European Monetary System in 1992–93, and
continuing with the Mexican peso in 1994–95, the East Asian cur-
rencies in 1997–98, the Russian ruble in 1998, the Brazilian real in
1999, and the Turkish lira in 2001. These reversals of capital flows and
resulting exchange rate devaluations or depreciations have often been
accompanied by sharp contractions in economic activity and have, at
times, entailed "twin crises"—crises in both the foreign exchange
market and the banking system (Kaminsky and Reinhart 1999, Tavlas
2000).

Third, there has been a tendency for instability in foreign exchange
markets to be transmitted from one pegged exchange rate regime to
others in a process that has come to be known as "contagion" (Masson

[2]For discussions of alternative exchange rate regimes, see Tavlas and Ulan (2002).
[3]This result is derivable from the Mundell-Fleming model with perfect capital mobility.

1998, Edwards 2000). The victims of contagion have seemingly included innocent bystanders—economies with sound fundamentals the currencies of which might not have been attacked had they adopted one of the corner solutions.

Fourth, the expansion in international trade in goods and services has heightened the relationship between exchange rate volatility and trade performance. The use of a common currency eliminates exchange rate risk and facilitates trade in goods and services and financial exchanges. The expansion of world trade has made this factor increasingly important (Alesina and Barro 2001). In the case of the EU, the rising concentration of trade among the members has meant that there are greater savings in transactions costs associated with the use of a single currency.

The implications of the hypothesis of the vanishing middle for smaller and medium-sized EU economies are clear-cut. In a world of highly mobile capital, two exchange rate regime options are viable: either floating exchange rates or a hard peg. Within the hard-peg option, there are several alternatives: a monetary union, a currency board, or official dollarization (or euroization). In what follows, the rational for the monetary union option is discussed and compared with the alternatives of a currency board, dollarization, and floating exchange rates.

The Calculus of Monetary Unification

Traditional optimal currency area (OCA) theory deals with the conditions under which economies can join together to peg the exchange rates of their currencies against each other irrevocably or adopt a single currency, follow a common monetary policy, and provide for the complete freedom of both current and capital transactions with each other; and the benefits and costs of participating in such an arrangement.[4]

With regard to the conditions necessary for monetary union, the earlier literature identified several characteristics as relevant for choosing the likely participants in an OCA. Friedman (1953) observed that an economy afflicted with price rigidities should adopt flexible exchange rates to maintain internal and external balance. Friedman's argument left the impression, however, that any economy should adopt flexible exchange rates irrespective of its other characteristics (i.e., apart from price flexibility) (Ishiyama 1975). Subsequent work, therefore, sought to refine the optimum currency domain. Thus,

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[4]For surveys of the OCA literature, see Tavlas (1993) and Mongelli (2002).

Mundell (1961) singled out factor mobility as the key attribute since where such mobility exists there is less need for nominal exchange rate variations as a means of correcting external imbalances in the event of an asymmetric shock between two economies. McKinnon (1963) introduced the idea of openness as a key characteristic. The more open the economy, the greater the desirability of fixed exchange rate arrangements since exchange rate changes in open economies are unlikely to be accompanied by significant effects on real competitiveness. Kenen (1969) argued that the higher the level of fiscal integration between two areas, the greater their ability to smooth asymmetric shocks through fiscal transfers from a low-unemployment region to a high-unemployment region.

While the foregoing approach has proven useful in some circumstances, it has lacked predictive power. For example, it is widely accepted that, in terms of the above criteria, the 12 participants in the EMU do not constitute an OCA to the extent that regions of the United States do (e.g., Beine et al. 2003 and De Grauwe 2003). Yet, the EMU is a reality. One major problem associated with the earlier approach is that the attributes by which optimality is judged need not point in the same direction. For example, an economy might be open (suggesting the preferability of a single currency), but the same economy might also possess a low degree of factor mobility with adjoining areas (implying the desirability of flexible exchange rates). This problem of inconclusiveness is compounded by the fact that the criteria are difficult to measure unambiguously and, therefore, cannot be formally weighed against each other (Robson 1987: 139).

The alternative approach, based on the benefits and costs of monetary union, is more pragmatic, has proven more relevant, and sheds considerable light on the drive toward the EMU.

Exchange Rate Uncertainty and Trade

The basic case in favor of monetary union rests on the desirability of eliminating exchange rate uncertainty, which is alleged to hamper trade and investment. The adoption of a single currency, however, eliminates exchange rate risk. This risk is equivalent to a cost to a risk-averse trader, and the trader will sometimes bear an explicit cost to avoid it. Although this cost may be small, particularly for short-term transactions (because transactions costs are low for foreign exchange), the bid-ask spread widens with volatility; also, forward markets exist for only about a year or so into the future. Since it is like a transportation cost, in that exchange rate risk affects trade in both directions, exchange rate risk will tend to reduce a country's exports and imports

(Tower and Willett 1976).[5] With regard to the EU, the single market has led to a substantial rise in trade among the members. The elimination of exchange rate uncertainty has been an important factor underlying the creation of a common currency.

Information and Transactions Costs

A single currency enhances the role of money as a unit of account and medium of exchange. With a single unit of account, price comparisons are facilitated, resulting in less market segmentation (Mongelli 2002). Since buyers can engage more effectively in comparison shopping, a single currency may promote competition. The benefits of a common unit of account are likely to be especially pronounced for open economies. In an open economy, an unstable exchange rate translates into an unstable price level, decreasing the "liquidity" (i.e., unit of account) function of money as a conveyor of information and a mechanism for facilitating calculations (McKinnon 1963). A single medium of exchange eliminates the transactions costs of converting currencies. Moreover, both the unit of account and the medium of exchange functions of money are subject to economies of scale. Thus, there are "network" effects involved in the use of money; the more widely a currency is used, the more useful it is to the holder because there is a greater number of other users (Dowd and Greenaway 1993).

There are other economies of scale derived from the move to a monetary union, including the enlargement of the foreign exchange market, decreasing both the volatility of prices and the ability of speculators to influence prices and, thus, to disrupt the conduct of monetary policy (Grubel 1970: 370); the elimination of the need of reserves for intra-area transactions and for offsetting speculative capital flows within the area (Fleming 1971); the *economizing* of reserves since, if members are structurally diverse, any payments imbalances may be (but are not necessarily) offsetting (Kafka 1969: 363); and the improved allocational efficiency of the financing process to the extent that it provides both borrowers and lenders with a broader spectrum

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[5]The arguments concerning the relationship between exchange rate variability and trade are not all on one side. For a more complete discussion, see Bailey, Tavlas, and Ulan (1987). These authors also distinguish between short-term exchange rate volatility and longer term misalignment, which they define as a departure over a substantial period of time of the exchange rate from its fundamental equilibrium value (i.e., the exchange rate that yields a cyclically adjusted current account balance equal to normal private capital flows—those capital flows that exist in the absence of undue restrictions on trade and special incentives to incoming or outgoing capital).

of financial instruments thereby enabling more efficient choices to be made in terms of duration and risk (Robson 1987: 140).

How important are the foregoing costs? The European Commission (1990) estimated that the elimination of currency conversion costs would amount to one-quarter to one-half of 1 percent of the Community GDP.[6] Meanwhile, the effects of a common currency on competition within the euro area are likely to involve a lengthy process and are not likely to be very important in countries (such as Greece) separated by large distances from other EMU members. Competition in the EMU can best be enhanced through measures that eliminate rigidities in product and labor markets.

Credibility

A major benefit of participating in the EMU, especially among countries such as Greece, Italy, Portugal, and Spain that have had recent histories of relatively high inflation rates, has been the credibility gain derived from eliminating the inflation-bias problem of discretionary monetary policy (Barro and Gordon 1983). This bias stems from two main sources: (1) attempts to overstimulate the economies on average, and (2) incentives to monetize budget deficits and debts (Alesina and Barro 2001). In turn, by eradicating inflationary financing of deficits and debts, the EMU is considered to impose strong financial constraints on the governments of the participating countries.[7]

The credibility gains from participating in the EMU for countries that in the past have practiced time-inconsistent monetary policies are substantial (Bird 2001). A credibility culture has taken hold: With low and stable inflation and inflation expectations, nominal interest rate differentials between these countries and countries with histories of relatively low inflation rates, such as Germany, have been essentially eliminated (Figure 1). Since there are no exchange rates among participating countries, there can be no exchange rate crises among these economies. Thus, there is no devaluation risk and no interest-rate premium to cover the risk of devaluation. With lower nominal interest rates, the cost of servicing public-sector debt is reduced, facilitating fiscal adjustment and freeing resources for other uses. Moreover, with

[6]An offset to the savings in transactions costs is the switching costs of physically changing to a new currency. However, unlike the costs of currency conversion, these changeover costs are one-off costs. The introduction of euro banknotes and coins at the beginning of 2002 is widely regarded as having been a major success.

[7]The stability of an economy's currency is closely linked to the stability of its finances. In the EMU, the Stability and Growth Pact aims to secure fiscal discipline. The Pact, however, has been challenged recently because several countries in the eurozone have exceeded the 3 percent of GDP limit imposed on budget deficits by the Pact.

FIGURE 1
10-YEAR GOVERMENT BOND YIELDS
DIFFERENTIALS VS. GERMANY
(PERCENTAGE POINTS)
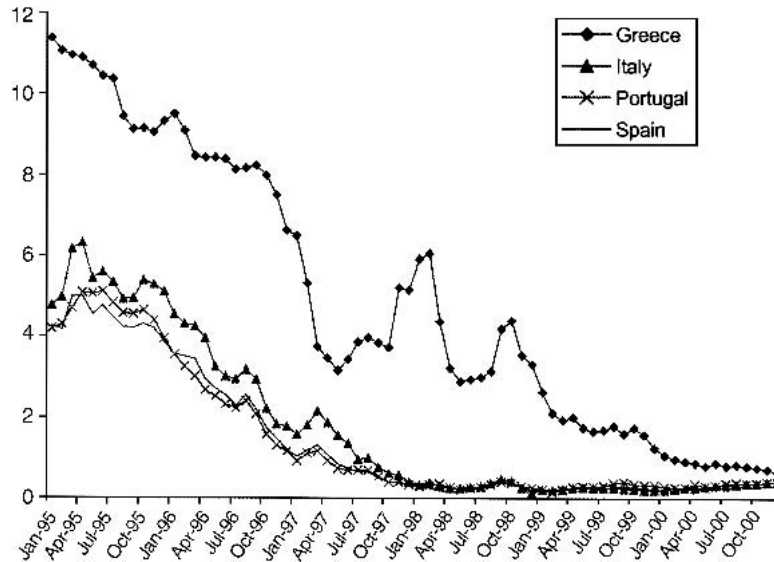
low and stable inflation, economic horizons lengthen, encouraging a transformation of the financial sector (Dornbusch 2001). The lengthening of horizons and the reduction of interest rates stimulate private investment and risk taking, fostering faster growth.

Dollarization and orthodox currency boards also entail increases in monetary policy credibility. By forcing a passive monetary policy, these regimes help reduce or eliminate the Barro-Gordon inflation bias. Moreover, by imposing a common monetary policy—in the case of dollarized economies and currency boards, with the country the currency of which is used as the anchor—all three regimes contribute to higher co-movements in business cycles (by eliminating national monetary policies as sources of shocks). A monetary union, however, is more difficult to undo than either official dollarization or a currency board. Therefore, the credibility gains are greater under monetary union.

The Issue of Seigniorage

According to the theory of optimal public finance, rational governments will use the different sources of revenue so that the marginal

cost of raising the last unit of revenue from each source is equalized. The less developed a nation's fiscal system, the greater the economic costs of raising revenue by increasing taxes and the lower the costs of increasing revenues through inflation (relative to the cost of taxation) (Tavlas 1993: 673; De Grauwe 2003: 20–21). Countries with under-developed tax systems, therefore, are said to undergo a significant cost by joining a monetary union that has a stable price level (Dorn-busch 1988, Artis 1991). For a given level of spending, such countries will have to raise taxes or let their budget deficits rise. They will experience a loss of welfare.

There are a number of reasons to be skeptical about the above line of reasoning. First, for seigniorage losses to be counted as social (as opposed to fiscal) losses, such losses need to be calculated under the assumption that, in the absence of monetary union, the national mon-etary authorities had attained full credibility; otherwise, we would be regarding as a social gain the proceeds of an excessive (and welfare-reducing) inflation tax (Chang and Velasco 2003: 65–68). Second, the (future) loss of seigniorage must be compared with the increase in tax revenue resulting from any future increase in growth attributable to a more stable economic environment (Antinolfi and Keister 2001: 31). For example, during the 1980s and early 1990s, inflation in Greece averaged close to 20 percent and seigniorage revenue is estimated to have averaged about 3 percent of GDP (Garganas and Tavlas 2001). Real GDP growth, however, averaged only about 1 percent. During 1995 through 2002, inflation in Greece averaged about 3 percent, while growth accelerated to about 3.5 percent on average. Third, calculation of the (future) loss of seigniorage must take account of the reduction in public-debt service costs resulting from lower real inter-est rates attributable to the more stable economic environment—that is, to a lower risk premium on the real interest rate (Dornbusch 2001). Fourth, seigniorage at the EMU level continues to be gener-ated, although in modest amounts, and is shared among the partici-pants. Fifth, the use of the euro as an international currency gener-ates additional seigniorage—beyond EMU borders.[8] For most par-ticipants in the EMU, the seigniorage revenues arising from the international use of a currency were not available when the former, national, currencies were in use.

The loss of seigniorage at the national level entails a possible geopolitical cost—the loss of the ability to use discretion over the issuance of money in exceptional circumstances, including military

[8]A recent study by the European Central Bank (2003) provides evidence showing that the international use of the euro has grown gradually in the past few years.

conflicts. Thus, as Glassner (1989: 36) argued, governments are likely to be reluctant to relinquish control over the issuance of money when they have defense responsibilities. In the case of the EMU, however, the traditional relationship between the potential for military conflict and seigniorage has been turned on its head. The political underpinning of the EMU (and EU institutions) has been the determination of national authorities to end a series of military conflicts (Goodhart 1995: 34–35). If such conflicts are eliminated, there will be no need for a national instrument of wartime finance among the participating countries. The forfeiture of seigniorage at the intra-EMU level represents a renunciation of any unforeseen need to finance the protection of national sovereignty.

How does the situation with respect to seigniorage under a monetary union compare with those under a currency board and dollarization? A currency board does not eliminate the national currency, but makes it, in principle, completely equivalent (at an irrevocably fixed exchange rate) to a foreign anchor currency (Hanke 2002). The currency board earns seigniorage, in terms of the receipts on its interest-earning anchor-currency assets backing the domestic money supply. Unlike a currency board arrangement, under dollarization the local currency is completely replaced by the foreign currency adopted. Thus, in the absence of a bilateral agreement for revenue-sharing, the client country forfeits seigniorage to the anchor-currency country. This loss is not a social waste (except to the extent that seigniorage is a social waste,) but rather a redistribution between the countries.

Other Factors

The foregoing discussion has focused mainly on the economic benefits of participating in the EMU. There are, in addition, potential political benefits. Together, the members of a monetary union may carry more weight than the individual constituent countries in negotiations with outside parties (Gandolfo 1993: 266). Eichengreen (2000: 326–27) argued that the creation of the EMU was partly the outcome of a political bargain under which the strong currency country (Germany) gave up the deutsche mark in return for a commitment by its partner countries to pursue political integration in the context of which Germany hopes to obtain a greater foreign policy role via the creation of an EU foreign policy.[9] As noted earlier, the forfeiture of seigniorage at the national level can be viewed, in part, as a commitment to a certain degree of political integration.

[9]Tavlas (1991) discussed the emergence of the deutsche mark as an international currency.

The main costs of participating in a monetary union are the loss of an independent monetary policy and the loss of the exchange rate tool in the event of an asymmetric terms-of-trade shock among the members of the union.[10] A number of caveats, several of which are particularly relevant for formerly high-inflation EMU economies, are important to mention.

First, for economies with histories of relatively high inflation rates, it could take many years to establish full credibility. In such a circumstance, the alternative regime of floating exchange rates could be prone to high exchange-rate volatility, especially if foreign exchange markets are thin. The lack of credibility may imply higher real interest rates because of, for example, a "peso problem" of a looming, unrealized exchange rate collapse (Berg, Borenstein, and Mauro 2000).

Second, an implication of the natural rate hypothesis is that the best that macroeconomic policy can achieve is price stability in the medium term (Friedman 1968). In terms of monetary-cum-exchange rate policy, domestic interest rates and the nominal exchange rate cannot be used to keep the unemployment rate away from its natural rate on a sustained basis. A logical extension of the natural rate hypothesis is that, in case of an external shock, the *real* exchange rate should be allowed to adjust to the *new* equilibrium after the shock has rendered the old constellation of prices obsolete. Such a change in the real exchange rate can be produced by either a change in the nominal rate or a change in domestic prices and wages.

Third, Barro-Gordon reasoning, and the experiences of many countries during the 1970s and 1980s, suggest that the benefit of an independent monetary policy and flexible exchange rate can be largely illusory. An implication of the time-inconsistency literature is that the more often the option to devalue the currency is used, the less effective it will be. The benefits of using the exchange rate tool today to adjust to a shock must be evaluated against the increase in the cost of using this instrument tomorrow (which, in turn, derives, in part, from using it today) (De Grauwe 2003).

Fourth, the costs of losing an independent monetary policy will be higher the less correlated the business cycle of the economy in question is with those of the other members of the union. To the extent that rising trade integration among EMU participants generates a higher covariance of business cycles, there will be less need of monetary policy at the national level.

Fifth, EMU member economies share an influence over EMU

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[10]An additional cost may be entering a monetary union at an overvalued exchange rate.

monetary policy through proportional representation. The Governor of each national central bank has an equal voice on the ECB's Governing Council, in a personal capacity, on each issue. This situation contrasts with those under a currency board and dollarization where monetary policy is made solely by the authorities of the anchor-currency economy. Also, under the EMU, the Governing Council takes into consideration the entire euro area, which, by definition, includes each participating economy, in formulating monetary policy. Under a currency board and dollarization, the authorities of the anchor-currency economy take account only of the situation in the center economy.[11] Like the EMU, other monetary unions (e.g., the East Caribbean Monetary Union and the two unions that comprise the African franc zone) also have proportional representation. Unlike the currencies of these other unions, however, the euro is allowed to float against other major currencies so that rigidity in the EMU is restricted to the loss of flexibility in cross-exchange rates within the area (Levy Yeyati, and Sturzenegger 2003: 6).[12]

Summary and Interpretation

The preceding discussion has argued, among other things, that (1) globalization is causing an evolution of the international monetary system toward the corner options of exchange rate regimes, and (2) the calculus of monetary unions provides strong reasons for why EMU economies have chosen the option of a single currency with a common central bank rather than separate currencies with floating rates, unilateral dollarization, or a currency board. These arguments, in turn, are consistent with the view that free choice in currency selection creates clusterings of economies into OCAs driven by market forces, based on the microeconomic criteria of money demanders and the trust generated by the issuer of a currency (Cohen 1996, 1998; Tavlas 1997). With the advent of fiat currencies and floating exchange rates, economic agents have effectively been allowed to cast ballots for the currency or currencies of their choice.

Ultimately, a credible currency depends on a governance structure that enforces the rule of law and sanctity of contracts and a political

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[11]Unlike a currency board and dollarization, a monetary union does not entail the loss of the lender-of-last-resort function.

[12]Thus, the degree of exchange rate flexibility of currency unions in the Caribbean or the franc zone is further restricted by pegging the common currency against the U.S. dollar and the French franc, respectively, which in practice implies the subordination of the union's (and not just a particular country's) monetary policy (Levy Yeyati and Sturzenegger 2003: 42).

system that delivers credible, noninflationary policies. The prior Darwinian interpretation of international monetary arrangements suggests that, for those governments that followed time-inconsistent policies in the past, credibility is difficult to achieve. In such circumstance, survival for some currencies may entail mutation into a different, stronger species, as in the case of the EMU.

New Approaches to Monetary Unions

Traditional OCA theory assesses the feasibility of monetary union in terms of an economy's shock-absorbing capacity. The analysis is static. It assumes, for example, a given level of labor mobility or openness.

Endogeneity

An interesting issue, that has only recently received attention in the literature, concerns the long-run, endogenous consequences of monetary union. One strand of recent research on OCA theory postulates a positive link between a common currency and trade integration. The basic intuition underlying this hypothesis is that a national currency is a significant barrier to trade. According to this view, a single currency and a common monetary policy preclude future competitive devaluations, facilitate foreign direct investment and the building of long-term relationships, and might (over time) encourage forms of political integration. These outcomes would, in turn, promote reciprocal trade, economic and financial integration, and business-cycle correlation among the economies sharing a single currency (Rose and Van Wincoop 2001, Mongelli 2002).

Empirical work (e.g., Rose and Van Wincoop 2001) suggests that the euro will cause trade among EMU economies to rise by more than 50 per cent. These results, however, need to be interpreted with caution, for several reasons. First, the trade-creating effects are said to have important supply-side effects, raising welfare. Trade expansion means that companies can better exploit opportunities offered by specialization and economies of scale. These effects, in turn, increase the productivity of capital and labor, and, therefore, raise potential output (De Grauwe 2002). Yet, the creation of the EMU has, so far, not led to a rise in potential output in the euro area. This circumstance suggests that the level of potential output in the EMU is mainly related to rigidities in labor and product markets. Second, the empirical methodology (i.e., a standard gravity equation) used in this literature is subject to several serious specification errors, including

errors stemming from omitted variables, incorrect functional form, measurement, and fixed coefficients.[13]

Eichengreen (2000, 2001) has identified a number of channels through which monetary union can, over time, affect the financial sector, the labor market, and the fiscal situation. For example, as discussed earlier the elimination of currency risk makes it easier for firms to borrow long term at home and abroad, thereby promoting the development of financial markets (Eichengreen, 2001: 270–71). The dramatic impact of the EMU on the growth of European financial markets is supportive of this view. Monetary union may also lead to labor market reform, encouraging greater real-wage flexibility (in the absence of the exchange rate option). Finally, by bringing down interest rates and reducing debt servicing costs, and by removing seigniorage at the national level, EMU should force governments to live within their means (Eichengreen 2001: 272). The forgoing results are, however, extremely tentative. The issue of the long-run implications of monetary union needs systematic empirical research.

Asymmetries

The issue of symmetries plays a key role in traditional OCA theory. If an economy is subjected to an asymmetric shock, or if there are asymmetries in economic structure (so that economies may react differently to symmetric shocks), then, in the presence of rigid prices and nominal wages, a nominal exchange rate adjustment is desirable. A key problem with the OCA literature, however, is that the role of asymmetries has not been investigated thoroughly. Specifically, there has been very little formal modeling of asymmetries, the relative importance of alternative asymmetries has not been examined and the overall quantitative importance of asymmetry in the cost-benefit calculus of monetary union remains unexplored.

Dellas and Tavlas (2003a) take a first step in examining this issue within the context of a stochastic, dynamic, three-economy general equilibrium model with optimizing agents. The main features of the model include nominal wage rigidities, active monetary policies (Taylor rules), and complete assets markets. The authors consider three types of international monetary arrangements: (1) flexible exchange

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[13]In a standard gravity equation, trade between a pair of economies is a negative function of the distance between the economies and a positive function of their combined GDPs. The gravity model controls for other factors, such as economy size. A dummy variable is used to capture the effects of a common currency. For a critique of such standard empirical methodology, see Swamy and Tavlas (2001).

rates among the three countries; (2) a "mixed" regime, and (3) a catholic monetary union. The authors examine the effects of asymmetries in the labor market, and with respect to both fiscal and monetary policies.

The authors find that, in the case of perfect symmetry, economies are better off when they participate in a currency union and the benefits increase with the number of participants. The benefits can be significant when the degree of nominal wage rigidity is high but they tend to be small when rigidity is low. This finding contrasts with the traditional OCA analysis as well as Friedman's (1953) case for flexible rates (namely, that flexible rates are desirable when wage rigidity is high) and holds despite activistic policy. This result is attributable to the following factors.

First, with fixed wages (as opposed to fixed prices) an economy's terms of trade can still adjust to a shock. The more flexible wages are, the smaller the relevance of the monetary regime for economic activity and welfare (i.e., the closer we are to monetary neutrality). Second, the model assumes production independence among economies. This assumption implies that a change in the exchange rate that has a favorable effect on demand for the domestic product also has unfavorable effects on the supply side of the economy (because it increases the cost of production via an increase in the price of imported goods). Third, in contrast to Friedman's analysis, Dellas and Tavlas (2003a) examine the effects of supply shocks. While a monetary union amplifies the effects of economy-specific supply shocks on the economic activity of the participants (by inducing real wage changes even in economies that have not experienced a productivity shock), it contributes to greater output stability by limiting terms-of-trade effects.

The authors find that asymmetries matter, especially when there are differences in the extent of wage flexibility among economies. Economies with substantial wage rigidities benefit from monetary union. These benefits increase with the elasticity of substitution between domestic and foreign goods and with the degree of openness. Economies with relatively flexible wages lose (in terms of macroeconomic volatility and welfare) when they join a monetary union with economies with relatively rigid wages. The authors also find that there is an attraction among those who are alike. In particular, the authorities of an economy with rigid labor markets, when asked to select a single partner, would rather form a currency union with an equally rigid labor market rather than one with a flexible labor market.

A drawback of the traditional benefits-versus-costs OCA approach is the following: a regional OCA may not coincide with the global

OCA. Given the degree of spillover effects and economic interdependence among closely integrated economies, the implications of regional currency blocs for global welfare should be considered (Dellas and Tavlas 2001). To address this issue, Dellas and Tavlas (2003b) use a dynamic general equilibrium model to examine whether eliminating exchange rate volatility between two currencies because of monetary unification resurfaces elsewhere in the global financial system. The key finding is that the extent and type of asymmetries determine the sign and size of global effects. In general, the global repercussions are limited when the economies that fix their currencies are sufficiently symmetric. Even in this case, there are some global effects when those economies that participate in monetary union (the "ins") have labor markets that differ in terms of flexibility from those of the economies that are outside the monetary arrangement (the "outs"), or when the "ins" and the "outs" differ in terms of aggressiveness in the pursuit of inflation stabilization objectives. Nevertheless, the strongest global effects emerge when the economies participating in the system of fixed parities do not satisfy the optimum currency area criterion of a similar economic structure.

Research on OCA theory using dynamic general equilibrium analysis is in its infancy. This research, however, can shed considerable light on the issue of asymmetries among economies. EMU economies, for example, are at similar levels of economic development.[14] This circumstance has made it easier to establish a monetary union without generating pressures for migration of labor and fiscal transfers on a scale that might prove unsustainable. Traditional OCA theory has little to say about such issues as the level of economic development, although such issues are likely to dominate future research into the feasibility of monetary unions.

Conclusion

The EMU is a manifestation of the tendency, driven by market forces, of the international monetary system to evolve toward either a hard peg or floating rates. Several factors have underpinned the move to monetary union in Europe, including rising trade integration, which renders changes in exchange rates increasingly disruptive, the aim of the authorities of some economies with histories of relatively high inflation rates to achieve the benefits of enhanced credibility, the

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[14]For example, per capita GDP (ppp-adjusted) in the EMU in 2000 ranged from $16,000 (Greece) to $27,400 (Belgium). In Latin America, per capita GDP ranged from $2,200 (Honduras) to $11,000 (Argentina) (Berg, Borenstein, and Mauro 2002).

renunciation of any means to finance the protection of national (as opposed to union) sovereignty, and the availability of a partner economy that had established a hard currency and was willing to sacrifice national monetary sovereignty as part of a wider calculus. In addition, the euro would not have been possible without years of economic convergence among economies with similar levels of economic development. The eventual participation of the EU accession countries in the EMU will entail a further market-related mutation of the international financial system into clusterings of OCAs.

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