The 'New' Theory of Optimum Currency Areas

George S. Tavlas

_Highbrow opinion is like a hunted hare; if you stand long enough it will come back to the place it started from._

Dennis Robertson

1. INTRODUCTION

The theory of optimum currency areas is back. Once dismissed as 'something of a dead-end problem' (Johnson, 1969, p. 395), and derided as 'primarily a scholastic discussion which contributes little to practical problems of exchange rate policy and monetary reform' (Ishiyama, 1975, p. 378), the subject was for years consigned to intellectual limbo. Recently, however, the optimum-currency-area issue has been resuscitated as scores of articles and books1 have appeared addressing what has been heralded as the 'new theory of optimum currency areas' (De Grauwe, 1992a). So complete has been the rehabilitation of the theory in professional circles that Krugman (1993, p. 18) has stated: 'It is arguable that the optimum currency area issue ought to be the centerpiece of international monetary economics.'

What accounts for this revival of interest in the subject? Two broad sets of factors have been primarily responsible. The first reflects developments on the international

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monetary scene, particularly the reinvigoration during the late 1980s and early 1990s of the process toward European monetary integration and the subsequent emergence of intense pressures within the exchange rate mechanism (ERM) of the European Monetary System in late 1992 and in 1993, eventuating in a widening of the fluctuation bands to 15 per cent for most currencies in the system and reigniting the debate over which countries should initially be included if Europe is to proceed with monetary unification. The second set of factors contributing to the rejuvenation involves developments in macro theory. These developments have allowed the original optimum-currency-area approach to be cast in a new light.

The purpose of this paper is to review recent extensions to, and refinements of, the approach. The remainder of the paper is divided into three sections. Section 2 distinguishes between monetary integration and several other related concepts that have been presented in the literature, and briefly summarises the central characteristics of the subject, circa the mid-1970s. Section 3 discusses recent modifications of the approach in light of developments in the analysis of expectations formation, the time-inconsistency problem, the analysis of exchange-rate determination, and the theory of uncertainty underlying labour mobility. The implications of these extensions and refinements of the subject for the extent of the optimum geographic area for a single currency are discussed in Section 4.

2. THE STATE OF THE THEORY IN THE MID-1970S

a. What is Monetary Integration?

There is no generally accepted definition of 'monetary integration' in the literature. Accordingly, it is useful to distinguish between this and other widely used concepts. In so doing, the definitions given below are consistent with those found in Corden (1972), Robson (1987), and Gandolfo (1992).

Just as there are various degrees of integration on the real side (e.g., customs union versus common market), so, too, there are various degrees of integration

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2 Indeed, the falling out of favour of the optimum-currency-area approach during the 1970s and much of the 1980s itself reflected developments in the international monetary system, including the loss of momentum toward European monetary integration in the aftermath of the move to a managed floating exchange rate regime.

3 Thus, Brociner and Levine (1992, p. 2) argue that: 'The delineation of an optimum currency area is vital to European economic and monetary union. Before asking the question, should Europe adopt fixed exchange rates and a single currency, one should ask, is Europe an optimum currency area?'.

4 The 'new theory of optimum currency areas' discussed in this paper is broader in scope than that found in De Grauwe (1992a), which briefly discusses only the implications for the approach of developments in expectations formation and the time-inconsistency issue.

5 In fact, as Gandolfo (1992) notes, the definitions given in the literature are sometimes contradictory with each other.
on the monetary side. One important reason why there are various degrees of integration on the monetary side has to do with the ‘fundamental incompatibility of the three desiderata of governments: exchange rate stability, capital mobility, and monetary autonomy’ (Cohen, 1992, p. 556). In particular, under a system of fixed exchange rates and free capital mobility, the pursuit of an independent monetary policy is likely to lead to disequilibrium in the balance of payments, resulting in speculative capital flows. Consequently, governments that attempt to maintain fixed exchange rates will have to either relinquish their monetary-policy autonomy, or resort to controls on capital flows. Alternatively, they will have to forsake the goal of pegged exchange-rates.

The foregoing argument is a version of Padoa-Schioppa’s (1988) ‘inconsistent quartet’, it facilitates the following categorisation of integration on the monetary side:

(i) **Exchange-rate unions.** Exchange rates between the participants are irrevocably fixed and margins of fluctuations are not permitted. However, monetary policies need not be coordinated. As a result, some form of capital controls are needed to influence domestic liquidity conditions.

(ii) **Pseudo exchange-rate unions.** This terminology is due to Corden (1972). It involves fixed exchange rates among the members, free capital movements and pledging of policy coordination, but no formal integration of monetary policies. As the above discussion on the incompatibility of the three desiderata indicates, such a system could not result in irrevocably fixed exchange rates since speculative capital flows would likely emerge.

(iii) **Monetary integration.** This arrangement, which is typically used interchangeably with the concept of currency areas, involves exchange rate unification — i.e., irrevocably fixed exchange rates and the absence of margins of fluctuations. Monetary integration also includes: full and irreversible convertibility of currencies (i.e., the absence of exchange controls); financial market integration; the complete liberalisation of movements on current transaction; and a common (union-wide) monetary policy. Consequently, monetary integration corresponds to the arrangement that has been envisaged to be in place at the beginning of the third stage of European monetary unification, as embedded in the Maastricht Treaty. In turn, financial integration involves more than just the liberalisation of capital transactions. As Robson (1987) observes, financial integration also entails the concerted adoption of measures to harmonise national financial regulations and structures of institutions. It should be pointed out that although some writers (e.g., Ingram, 1973; and Masson and Taylor, 1992) presume that the above items are consistent with ‘irrevocably’ fixed exchange rates, this outcome is by no means a certainty, as will be discussed below.

(iv) **Monetary unification.** This concept involves monetary integration plus a
single currency and a common central bank. Thus, the use of the standard
instruments of monetary policy is consigned to the community and exercised
solely by its monetary authority, leaving no independence for member
states. Monetary unification also implies that responsibility for exchange
rate policy with other currencies and for the balance of payments of the
entire community with the rest of the world must also be assigned to the
community. The monetary authority of the community controls the pool
of foreign exchange reserves (Robson, 1987, p. 137).

It is the concept of 'monetary integration,' whereby countries join together in
an attempt to irrevocably fix their exchange rates and follow a common monetary
policy, that is most often referred to, explicitly or implicitly, in the literature
with reference to currency-area participation. Under what conditions should countries
move in the direction of monetary integration? What are the benefits and the costs
of doing so? These are the two central questions with which the theory of optimum
currency areas has been concerned.

b. Characteristics of the Potential Members

The earlier literature on optimum currency areas has been dealt with in numerous
textbooks on international economics (e.g., Gandollo, 1987; and Salvatore, 1993b),
and the following overview can therefore be brief. The following characteristics
(i.e., preconditions) have been identified as relevant for choosing the likely
participants in an optimum currency area:

(i) Similarity of inflation rates. When inflation rates between countries are
similar, an equilibrated flow of current account transactions is more likely
to take place within the currency area than if inflation rates are divergent
(Fleming, 1971).

(ii) The degree of factor mobility. Countries between which there is a high
degree of factor mobility are viewed as better candidates for monetary
integration because factor mobility provides a substitute for exchange
rate flexibility in promoting external adjustment (Mundell, 1961; and
Ingram, 1962).

(iii) The openness and size of the economy. Open economies tend to prefer
fixed exchange-rate arrangements since exchange-rate changes in such
economies are not likely to be accompanied with significant effects on
real competitiveness (McKinnon, 1963). Moreover, in open economies
frequent exchange rate adjustments diminish the liquidity property of

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6 See also De Cecco (1974), Ishiyama (1975), Tower and Willett (1976), and Kawai (1987) for
comprehensive surveys of the earlier literature.
money, since the overall price index would vary more than in relatively closed economies (McKinnon, 1963). As a corollary to this criterion, note that the smaller the size of the economy, the more open it is likely to be and, thus, the more inclined to join in a currency area.

(iv) **The degree of commodity diversification.** Highly diversified economies are viewed as better candidates for currency areas than less-diversified economies since the diversification provides some insulation against a variety of shocks, forestalling the need of frequent changes in the terms of trade via the exchange rate (Kenen, 1969).

(v) **Price and wage flexibility.** When prices and wages are flexible between (or among) regions, the transition toward adjustment between regions is less likely to be associated with unemployment in one region and inflation in another, diminishing the need of exchange-rate adjustment (Friedman, 1953; and Kawasaki, 1987).

(vi) **The degree of goods market integration.** Countries that possess similar production structures are prone to symmetric terms-of-trade shocks, regarding the effectiveness of the exchange-rate tool between the countries. Consequently, countries with similar production structures are deemed to be better candidates for currency areas than are countries whose production structures are markedly different (Mundell, 1961).

(vii) **Fiscal integration.** The higher the level of fiscal integration between two areas the greater their ability to smooth out diverse shocks through fiscal transfers from a low-unemployment region to a high-unemployment region (Kenen, 1969). In turn, fiscal harmonisation usually implies that the members of a currency area also enter some form of political union.

(viii) **The need for real exchange rate variability.** Criteria (i) through (vii) are difficult to measure unambiguously and cannot be formally weighted against each other. Vautel (1976 and 1978) thus proposed the smallness of countries’ need for real exchange-rate changes, derived from their historical data, as the crucial characteristic since “real exchange-rate changes are clearly measurable and automatically give the appropriate weights to the economic forces of which they are the result” (1976, p. 440).

(ix) **Political factors.** In an overlooked article, Mintz (1970, p. 33) argued that “the major, and perhaps only, real condition for the institution [of monetary integration] is the political will to integrate on the part of the prospective members.” This view has recently received empirical support from Cohen (1993) in a study of six currency unions. Cohen finds that the economic criteria are dominated by political factors in successful currency areas. He also finds that compliance with

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7 Mintz’s paper has been cited by Cohen (1993)
commitments is greatest in the presence of either a locally dominant state, willing and able to use its influence to sustain monetary cooperation, or a broad network of institutional linkages sufficient to make the loss of monetary autonomy tolerable to each partner.8

c. Benefits and Costs of Participation

The basic case in favour of monetary integration rests upon the desirability of exchange rate certainty. Exchange rate uncertainty, so the argument goes, hampers 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. Being 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). Further, it has been argued that a single currency enhances the role of money as a unit of account by setting economies of scale into play, thereby decreasing transactions costs, including the costs of information, search, uncertainty, and calculation. (See, for example, Grubel, 1981, pp. 504–05). As Mundell (1961) pointed out, the ability of money to function as a means of payment declines, and the costs of currency conversion increase, the larger the number of currencies under flexible exchange rates.9

Additionally, the adoption of a single currency would eliminate the need of firms to maintain staff to look after currency exchanges within the area (Grubel, 1981, p. 505). Other economies of scale to be derived from the move to monetary integration include those associated with: 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 (Mundell, 1961; Grubel, 1970, p. 370; and Tower and Willett, 1976, p. 7); the elimination of the need for reserves for intra-area transactions and, to the extent that exchange rate parities are truly immutable, the elimination of the need for reserves due to the removal of speculative capital flows within the area (Fleming, 1971); the economizing of reserves since, if members are structurally diverse, any payments imbalances may be offsetting (Kafka, 1969, p. 363); and the improved allocational efficiency of the financing process to the extent that it provides both borrowers

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8 The role of political factors in the European Monetary System is discussed by Fratianni and von Hagen (1992, pp. 16–19).
9 Dowd and Greenaway (1993) show formally that, in identifying an optimal currency area, it is necessary to pay particular attention to the unit of account and medium of exchange functions of money.
and lenders with a broader spectrum of financial instruments thereby enabling more efficient choices to be made in terms of duration and risk (Robson, 1987, p. 140).

The early literature ascribed two main costs to a country's joining a currency area. One was the loss of the use of the exchange rate tool, which could be especially severe in the event of differentiated terms-of-trade shocks among the members of a currency area. Note, however, that the greater the fulfillment of the criteria (e.g., factor mobility, wage-price flexibility) underlying optimum-currency-area formation, the less necessary the use of this tool. The second cost was the loss of monetary policy independence. In view of the belief by a number of writers in a stable short-term Phillips-curve trade off, this cost was viewed as particularly acute in that a nation could no longer pursue an independent monetary policy to choose its desired mix between inflation and unemployment (Tower and Willett, 1970 and 1976; and Corden, 1972). Some took the argument even further, suggesting that monetary policy would be completely ineffective in a currency area. Specifically, in the context of the Mundell-Fleming model, fixed exchange rates and perfect capital mobility imply that changes in the stance of monetary policy in one region are instantaneously offset by capital flows from or to the other region, bringing the monetary base to its initial position. In this limiting case, there is no room at all to conduct independent monetary policy (Tower and Willett, 1976, p. 213).

3. THE 'NEW' THEORY OF OPTIMUM CURRENCY AREAS

Recent work on the optimum-currency-area issue has continued to emphasise the criteria approach underlying the choice of an optimum currency domain as well as to enumerate the benefits and costs associated with monetary integration although, as will be shown below, one criterion has been turned on its head. The theory of optimum currency areas has been modified, however, in line with developments in expectations formation, the time inconsistency and credibility problems, labour mobility under conditions of uncertainty, and exchange rate determination. These developments seek to clarify the benefits and costs of currency-area participation, so that a country can 'get it right' when it joins a currency area. For as Barro (1992) has observed, one drawback from 'getting it wrong' is the high cost of dissolving the currency linkages later on.

a. The Vertical Phillips Curve and Policy Ineffectiveness

As noted, the mid-1970s literature assumed that flexible exchange rates would allow a nation to pursue an independent monetary policy so as to choose an optimum point along its Phillips curve. This view of a permanent trade-off between inflation and unemployment was, of course, undermined by several developments. First,
the Friedman-Phelps hypothesis that the steady-state unemployment rate is not related to the steady-state inflation rate when the Phillips relationship is augmented by a variable representing the expected inflation rate (i.e., labour negotiates on the basis of real, and not nominal, wages). Second, Lucas's work showing that, even in the short-run, perfectly anticipated changes in policy could, under certain conditions (e.g., costless information, perfectly flexible prices and wages), exert no impact upon real variables. Third, the experiences of many countries during the 1970s and early 1980s of rising unemployment in association with increasing inflation. As Artis (1991, p. 316) has remarked, 'the displacement of the Phillips curve by the "natural rate of unemployment" as the place to start analysis is going to mean that the only benefit of floating exchange rates is the ability to choose a different rate of inflation from other countries — and we now see little reason to want to choose a positive rate of inflation.'

(i) The nominal anchor issue. A monetary union between two countries, achieved with fixed exchange rates, imposes identical interest rates (except for a risk premium) in the two countries. There are, however, many levels of interest rates and, thus levels of the money supply, that can fulfill the fixed exchange rate commitment. Consider, in this connection, the following simple two-country model of the money markets. Assume that each country, called A and B, respectively, possesses traditional money demand functions:

$$ P_A L_A (Y_A, i_A) = M_A $$  \hspace{1cm} (1)

$$ P_B L_B (Y_B, i_B) = M_B $$  \hspace{1cm} (2)

where $P_A$ and $P_B$ are the price levels in country A and country B, respectively, $L_A$ and $L_B$ the money-demand functions, $Y_A$ and $Y_B$ are the levels of real income, $i_A$ and $i_B$ are the nominal interest rates, and $M_A$ and $M_B$ are measures of the nominal stock of money. Assume that the money markets of the two countries are linked together by the fact that capital is freely mobile (i.e., instantaneous adjustment) between the two countries. Also assume that the financial assets of the two countries are perfect substitutes (i.e., in addition to instantaneous adjustment, no risk premium exists). These assumptions allow us to write the open interest rate parity condition:

$$ i_A = i_B + \epsilon $$  \hspace{1cm} (3)

where $\epsilon$ is the expected rate of depreciation of the currency of country A (appreciation of the currency of country B). Under monetary integration, $\epsilon = 0$, so that

$$ i_A = i_B $$  \hspace{1cm} (4)

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10 For a discussion, see McCallum (1989, pp. 174–91).
11 This model has been proposed by De Grauwe (1989) and by Gandolfo (1992).
Even if we take the price levels and output as given, equations (1), (2), and (4) form an undetermined system of three equations and four unknowns (the two money supplies and the two interest rates).

Accordingly, the countries will have to agree on how monetary policy should be conducted. In other words, there must be some mechanism that pins down the money stock in the system — i.e., the problem of providing a nominal anchor to the system (De Graauw, 1989, p. 202). For example, if country A takes the dominant role and sets the level of the money supply, this course of action will determine the level \( i_A \) via equation (1); in turn, \( i_A \) will determine \( i_B \) via equation (4), which will determine \( M_B \) via equation (2). This problem of pinning down the nominal money stock has implications for the credibility issue and for the shape of the long-run Phillips curve of the centre country (see Section 3b, below). It also has implications for the ability of member countries to conduct anti-recessionary monetary policy in the face of adverse terms-of-trade shocks.

(ii) Monetary neutrality: some caveats. There are two kinds of arrangements that can be used to pin down the money stock in a monetary union — symmetric system in which the members cooperate in reaching a policy solution (in the example above, countries A and B jointly determine the level of the system-wide money supply), and asymmetric systems in which one country takes a leadership role (for example, country A first sets the level of its money supply and country B sets its money supply accordingly). Each type of arrangement has its own kind of problems; recent work on the theory of optimum currency areas, while acknowledging the validity of the long-run monetary-neutral proposition, also recognizes that, in view of the nominal anchor issue, a number of qualifications to that proposition are in order.

With regard to symmetric systems, as Frenkel and Goldstein (1986, p. 650) point out, symmetric (i.e., co-operative) monetary integration entails the loss of the 'safety-valve' provided by the market place for foreign exchange as a mechanism of conflict resolution that does not involve resort to either suspension of currency convertibility or restrictions on trade and capital flows. Thus, in instances in which the members of a co-operative system are hit by an asymmetric shock, competitive pressures will build for the discontinuation of co-operation and the adoption of independent, national monetary policies (Friedman, 1989 and 1992; Feldstein, 1992; and Salvatore, 1993a). It was precisely the build up of pressures stemming from an asymmetric shock that led to the turbulence in the ERM in late 1992 and in 1993.

In addition, as De Graauw (1992b) has demonstrated, asymmetric (i.e., hegemonic) systems also entail problems in the pursuit of monetary policy objectives; such systems can lead to an exacerbation of the domestic business cycle in the peripheral countries. To demonstrate this outcome, assume that only a peripheral country is hit by a negative terms-of-trade shock and a corresponding contraction in real income. Its money supply should be allowed to expand, but participation in the system prohibits its monetary authorities from taking
expansionary action. In addition, the contraction of real income results in a decline in the demand for money, causing interest rates to fall and leading to capital outflows. Since the centre country does not change its monetary-policy stance, it sterilises the capital inflow, keeping its interest rates unchanged. Hence, the capital outflow in the peripheral country effects a contraction of its money supply. The country loses not only its ability to conduct an independent monetary policy, but experiences money-supply effects that exacerbate the business cycle (De Grauwe, 1992b, pp. 118–19). Thus, as pointed out by Fratianni and von Hagen (1992, p. 4), an important precondition for following a common monetary policy ‘depends critically on the nature and the mix of shocks to which the participant countries are exposed’ (see, also, Kawai, 1992). Moreover, had the peripheral country been able to conduct an independent monetary policy, the transmission effects of the expansionary policy would be reinforced via the Mundell-Fleming exchange rate channel — i.e., the exchange-rate depreciation produced by the expansionary monetary policy would improve the trade balance (as imports contract and exports expand), leading to a further rise in real income (i.e., in addition to the rise produced via lower interest rates) (Feldstein, 1991; and Corden, 1992).

Several other caveats to the monetary-policy neutrality proposition have also been made in the recent literature:

First, when confronted with identical shocks, individual nations may require different responses arising from differences in initial positions and differences in behavioural parameters about fundamental matters such as price and wage flexibility, tax structure, and trade responsiveness (Méritz, 1991, p. 321; and Tobin, 1993); thus, two countries subject to symmetric shocks may have exchange rates aligned (i.e., differences in initial conditions) at levels that produce external disequilibria. In this connection, Tobin (1993) has argued that the United Kingdom chose to enter the ERM at an overvalued rate, resulting in external disequilibrium for that nation.

Second, in a single currency area an implication of endogenous growth effects ‘is that production is likely to become more spatially concentrated and more specialized,’ increasing the vulnerability of regions within the area to asymmetric shocks (Artis, 1991, p. 317). The argument underlying this view is that in the presence of exchange rate uncertainty, long-term decisions about the location of production facilities and the scale of unit operations must take account of exchange rate risks. A plausible hedging response is firms’ scattering production facilities across markets. This response is not necessary under fixed rates, leading to more geographic concentration of production facilities (see Bailey and Ravlas, 1988 and 1991; De Grauwe, 1989 and 1992b; and Artis, 1991).12

Third, the use of a single currency entails the imposition of legal restrictions

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12 In contrast, Emerson et al. (1992, p. 142) argues that monetary integration increases industrial integration, rendering the effects of sector specific shocks to be more symmetric.
to compel its use, but such restrictions are not without their costs. Two main arguments have been used to justify legal restrictions: they discourage excess currency substitution, and they can help focus and stabilise expectations so that it becomes easier to predict what agents will do, reducing forecast errors. Dowd and Greenaway (1993, p. 11) show, however, that ‘the legal restrictions implied are likely, on balance, to do more harm than good.’ With regard to the former argument, Dowd and Greenaway argue that legal restrictions might not prevent currency switching but only raise its private costs. Moreover, while such restrictions can help stabilise expectations, any benefits so-derived ‘must be weighed against the costs that arise from the excess inertia they could be expected to create . . . if the social optimum requires the opposite.’ (Dowd and Greenaway, 1993, p. 10).

Fourth, the loss of seigniorage revenues at the national level, which is particularly acute for countries with an underdeveloped tax system (Artis, 1991, p. 319). 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 through these different routes is equalised. The less developed a nation’s fiscal system, the greater the economic costs in raising revenue by increasing taxes, and the lower the costs of increasing revenues through inflation (relative to the cost of taxation) (De Grauwe, 1992b, p. 27–28).

b. The Time-inconsistency Issue

As noted, the early literature on optimum currency areas applied the criterion of similarity of inflation rates as a precondition for joining a currency area. The time-inconsistency issue reverses the ordering between similarity of inflation rates and currency-area participation. Specifically, similarity of inflation rates becomes a desirable outcome (and not a precondition) to be derived from such participation.¹⁴

The argument runs as follows. Because it does not affect all prices proportionately, inflation distorts the movements in relative prices through which market information is normally transmitted, thereby creating uncertainty and leading to an inefficient allocation of resources.¹⁵ Furthermore, inflation reduces the purchasing power of money, debasing money’s function as a store of value. In turn, a protracted record of relatively low inflation and low inflation variability depend importantly upon credible and stable government policies, particularly monetary policy.

A country whose authorities have a reputation of pursuing inflationary policies

¹³ The classic article on seigniorage is due to Bailey (1956). For empirical estimates of optimal seigniorage, see Bailey and Tavlas (1988).
¹⁴ This point has been made by Gandolfo (1992).
¹⁵ Discussions of the costs of inflation are provided in Goodhart (1989), Ball (1991), and Tavlas (1991 and 1992).
will find it difficult to shed that reputation without a long and costly process of disinflation (Giavazzi and Pagano, 1988; Mélitz, 1988; and De Grauwe, 1992a). Barro and Gordon (1982) have shown that, to gain a reputation of credibility, authorities must pursue a policy rule that is time consistent. The time-consistency literature argues that the public recognises that policy makers have every reason to assert that they will aim for low inflation, but it also recognises that policy makers have a greater incentive to renge if the public accepts the assertion at face value (De Grauwe, 1992b, pp. 45–55). According to this view, the public will not believe that low-inflation will be maintained unless policy makers can provide evidence that they are following a policy rule that will yield low inflation. That is, if a particular policy rule is expected to become suboptimal in a future period, economic agents will assume that the authorities will change the rule, even if they have announced that they will not change the rule. As a result, the rule is not time consistent, and it will lack credibility (De Grauwe, 1992a; and Englehardt, 1991, p. 73).

One way to gain credibility is by ‘tying the hands’ of the authorities by some kind of institutional change. As De Grauwe (1992a, p. 450) has noted: ‘the most drastic change consists of abolishing national monetary sovereignty by joining a union with a low inflation country. In so doing, the high inflation country immediately reaps the benefits of a low inflation reputation, without any loss of output and employment.’ Since there is no permanent Phillips curve trade-off, the high inflation country has little, if anything, to lose (in the long run) and much to gain by joining a currency area with a low inflation country. While, in principle, other domestic commitment mechanisms to contain inflation can be devised (e.g., monetary growth targets), many countries have not been able, for political reasons, to create domestic monetary institutions committed to price stability. As Fratianni and von Hagen (1992, p. 165) point out: ‘Collusion, in the form of fixed exchange rates, can remove monetary policy from politically dependent domestic authorities and delegate it to a more independent foreign authority.’ Additionally, Giovannetti (1992, p. 126) argues that a further reason in favour of preferring an exchange-rate target to a monetary-growth target is that ‘exchange rates are observable, while the money supply, to the extent that it is endogenous, is difficult to control.’ However, this argument begs the question of whether the exchange rate is not also an endogenous variable and, therefore, difficult to control. In this connection, Dellas (1988) has argued that the exchange

16 Russo and Trullio (1988) argue that a properly functioning fixed exchange rate system needs rules governing inflation as well as rules guaranteeing smooth balance of payments adjustment; the authors analyse the performances of four alternative rules.

17 Fratianni and von Hagen (1992, pp. 75–96) find that the European disinflation of the 1980s was mainly the result of a consensus in the region to reduce inflation and the willingness by political leaders to bear the cost of restructuring domestic policies; the authors conclude that ‘these forces were far more important than EMS membership’ (pp. 96–97).
rate is indeed an endogenous variable and that pegging alone, without the support of other policy measures, will not help in gaining credibility.

(i) Short-run adjustment costs. Given that a high inflation country has much to gain in the long run from tying its hands to a low-inflation country, this gain has to be weighted against the transition costs involved in the adjustment to a common role of inflation (Robson, 1987). These costs derive from the fact that, although there is no permanent trade off between inflation and unemployment, such a trade-off probably exists in the short run. As Robson (1987, p. 153) points out if there are differences between the short-run Phillips curves of the prospective member countries, adjustment costs — in terms of increased unemployment — would necessarily be imposed upon some members as a result of the adoption of a common target rate of inflation even if the members were initially on their long-run Phillips curves. The magnitude of such costs will be determined by a number of factors including: the time frame specified for the attainment of a common rate of inflation; the speed at which expectations adjust to actual inflation; the form of the short-run Phillips curve; and the initial discrepancies between the union-adopted rate of inflation and the target rates of inflation that each member would otherwise choose (Robson, 1987, p. 153).

A further transitional-cost issue has been raised by Walters (1986). If, during the transition, nominal exchange rates are expected to remain fixed, capital mobility will equalise nominal interest rates (see equation (4) above). Therefore, a high inflation country will have a low real interest rate, which will be expansionary, raising inflation differentials and real exchange rate divergence. As Portes (1993, p. 4) has pointed out, if the high inflation country tries to tighten monetary policy, net capital inflows will increase, thwarting the intended (tightened) stance of monetary policy.

(ii) The incentives for the hegemon. The time-inconsistency literature points to clear long-term gains for the peripheral countries to be derived from monetary integration. In asymmetric systems, it is less clear what the gains are for the anchor-currency country. Several explanations have been offered, including the desire of the dominant country to promote its monetary leadership (Cohen, 1993, p. 199) and its wish to decrease speculative capital flows in order to enhance its control over domestic monetary conditions (Tavlas, 1991). Against these possible benefits, there are possible costs for the hegemon. As Krugman (1991a, p. 61) and De Grauwe (1992a, p. 450) have observed, to the extent that the hegemon takes economic conditions in the peripheral countries into account, it is also possible that the low inflation country will experience a reduction in reputation. Consequently, with regard to economic factors, the answer to the question as to why a hegemon would wish to participate in a currency area is ambiguous. As Fratianni and von Hagen (1992, p. 68) state with regard to the European Monetary System (EMS): 'the disciplinary view of the EMS leaves important questions unanswered such as how to explain German membership in the system.'
(iii) The role of fiscal policy. The monetary neutrality argument presented above implies that, under rational expectations, the freedom to pursue an independent (inflationary) monetary policy is not worth very much, particularly in connection with floating rates. However, because monetary and fiscal policies often have rent-seeking (i.e., distributional) aspects, a qualification is in order. Specifically, those governments that have credibility problems generally have the following policy mix: extravagant government spending; easy credit from the central bank and from other state-controlled institutions to special interest groups; and, an overvalued exchange rate. Historically, this combination has led to borrowing from abroad until the supply of foreign credit dries up, at which time the government restricts international trade and payments. A currency union, or an agreement to peg exchange rates rigidly, may give such a government access to a new line of credit from foreign central banks because these banks have to intervene to maintain the agreed peg.

Thus, if Europe becomes a single currency area while the present central banks and government budgets remain separate, Greece and Italy, for example, would have unlimited borrowing rights, from France and Germany, until and unless the latter countries call a halt to the process. While it lasts, the process facilitates the policies of the short-sighted, profligate government. This argument calls attention to the need for the countries in a currency union to formally give up both their independent monetary and fiscal policies, or to follow common monetary and fiscal discipline. Otherwise, the currency union will break down.\textsuperscript{18}

(iv) The credibility issue and the slope of the Phillips curve. Fratianni and von Hagen (1990a) have argued that, in a hegemonic monetary union, the slope of the Phillips curve in the centre country is flatter than it would be if that country had not undertaken the leadership role. For example, if say, Germany unexpectedly increases its rate of monetary growth, the domestic inflationary effects are reduced since with fixed exchange rates (or a single currency), the inflationary effects are spread throughout the system (De Grauwe 1992b, p. 109). According to Fratianni and von Hagen, this outcome increases the incentives for the German monetary authorities to generate more expansionary monetary policy and, thus, higher inflation. Under rational expectations economic agents are aware of this changed policy stance; accordingly, inflationary expectations increase, thereby raising the equilibrium rate of inflation in Germany.

A problem with this argument, however, is that, since German monetary policy (in this example) is the policy that is mimicked by the rest of the system, an expansionary German monetary policy leads to corresponding expansionary

\textsuperscript{18} McKinnon (1993, p. 4) argues against a move to a single currency by European countries "because debt overhangs at the national level are simply too high in an absolute sense. European governments — whether in the "core" or not — cannot afford to cede control of their national central banks to some pan-European authority."
monetary policies in the rest of the countries in the system. This outcome would produce reverse spillover effects from the rest of the system to Germany. Thus, domestic inflationary effects can also be transmitted from other countries in the system to Germany, negating the increase in real economic activity sought by Germany and leaving all of the countries in the union with higher inflation. The extent of such mimicking by the peripheral countries depends upon the degree of integration on the monetary side. In a system of monetary integration, such mimicking would be formalised in the institutional structure. In less formal systems, such as the ERM, other countries need not follow the hegemon’s lead. If they do not, then the Fratianni and von Hagen argument is valid.

(v) Can pegged exchange rates remain irrevocably fixed? It is worthwhile to point out that the proclivity found in the literature to equate a single currency with ‘irrevocably’ fixed exchange rates is subject to question. For the latter concept to be the same as the former, two conditions are sufficient: the monetary authorities eliminate all price (i.e., exchange rate) risk by guaranteeing a fixed price at which they buy and sell foreign exchange; and the authorities eliminate the risk of illiquidity by permitting all agents to buy and sell unlimited quantities of foreign exchange at that fixed price. To implement the second condition, however, agents must have confidence that the authorities can maintain the fixed price. Otherwise, speculative runs could take place leading to either imposition of controls (violation of the second condition) or a violation of the first condition. If either of these violations occurs, the equality between a single currency union and a system of ‘irrevocably’ fixed exchange rates breaks down. It is the likelihood that such violations will occur that led Gandolfo (1992, p. 768) to state: ‘The expression “irrevocably fixed exchange rates” has no practical significance ... History is full of irrevocable commitments to fixed exchange rates that have broken down.’

c. Labour Mobility Under Uncertainty

Recent work in the microeconomic theory of costly reallocation under uncertainty has attempted to show that the degree of uncertainty about the future and the size of the adjustment costs are important determinants of resource-reallocation decisions in response to disturbances. The more uncertain the environment, the less should be the willingness of ‘national economic agents to undertake adjustment that may ex-post be regretted’ (Bertola, 1989, p. 95).

A model with microeconomic foundations under conditions of costly resource reallocation and uncertainty has been applied to Mundell’s factor flexibility criterion by Bertola (1989). Specifically, Bertola models an agent who faces the choice between remaining in his current occupation or location or moving to another, with income uncertain in both locations and with fixed costs of moving. In this case, to induce movement, the expected income differential must exceed the fixed moving cost by an amount that is related to the probability that the agent may
want to reverse the movement in the future. This amount can be modelled as the price of an option to move. In this framework, Bertola shows that the pattern of movement exhibits hysteresis. Within a range of expected income differentials, there is no movement, and the width of this range depends positively on the degree of uncertainty. Thus, Bertola (1989, p. 107) argues that: 'The higher is uncertainty about future earnings in different locations or sectors, the more reluctant an individual should be to move — both because she is aware that migrating back will be costly if the wage differential changes sign, and because even larger earning differentials will induce migration by others, reducing (through externalities) the income available to her in the new location.'

Bertola goes on to suggest that, in the fixed exchange rate version of the Mundell-Fleming model, asymmetric terms-of-trade disturbances between two areas increase income variability. Since the higher is income variability the less mobile is labour between two areas, more stable exchange rates reduce factor mobility. Conversely, under flexible exchange rates, monetary policy can aim at stabilising income; with less income variability, factor mobility is higher than it would be (other things being equal) under a fixed rate regime. However, as Branson (1989) points out, Bertola's results depend upon a restrictive version of the Mundell-Fleming model; this restricted version biases the results in favour of exchange rate flexibility. An alternative formulation would use monetary policy to stabilise the exchange rate and fiscal policy to stabilise income. In this latter version of the Mundell-Fleming model, 'stability of the exchange rate makes fiscal policy more effective. This will increase factor mobility, and make it even easier to stabilise income' (Branson, 1989, p. 12).

d. The Process of External Adjustment

(i) Exchange rate determination and adjustment. The earlier literature on optimum currency areas viewed the issue of the relative efficacy of factor mobility versus exchange-rate adjustment in effecting external adjustments in terms of a flow model of exchange rate determination; thus, exchange rate changes were viewed as providing a speedy and effective adjustment for external disequilibrium since exchange rates were thought to be influenced primarily by movements in trade flows.

Corresponding to the emergence of the asset model of exchange rate determination, recent writers have stressed the view that, while exchange rate changes serve to bring about external adjustment, the lags involved are considerably longer than implied in the flow model (e.g., Krugman, 1991b). The following factors have contributed to this outcome.

The portfolio-balance model. In line with the portfolio-balance model of exchange rate determination, it is useful to assume that domestic and foreign bonds are imperfect substitutes, and that domestic residents in each country have a greater tendency to hold wealth in the form of domestic bonds than do foreign residents.
Under such conditions, a sustained current account deficit in the domestic country would lead to an increase in the risk premium required to induce investors to hold securities denominated in its currency. It would also lead to a transfer of wealth from domestic residents to foreign residents, thereby increasing the demand for financial instruments denominated in foreign currency and decreasing the demand for financial assets denominated in the domestic currency. Assuming perfect foresight, the current account influences exchange rates indirectly, via the influence of wealth on risk premia (i.e., uncovered interest rate parity does not hold and domestic and foreign assets are imperfect substitutes). However, the adjustment process is likely to be a lengthy one since it depends on the condition that cumulative current account positions affect the distribution of wealth, which, in turn, affect risk premia. Relaxing the assumption of perfect foresight can lead to such outcomes as speculative bubbles in which the exchange rate moves on an explosive path, taking it progressively farther away from the underlying economic fundamentals. Since, in the case of speculative bubbles, exchange rates do not react to such fundamentals as external disequilibria, exchange rate movements do not serve to correct such disequilibria (except perhaps when the bubbles burst).

**Exchange rates and Ricardian equivalence.** If changes in the real exchange rate and the current account are viewed as the outcomes of an intertemporal maximisation problem, then the effects on the exchange rate of changes in macro policies can be ambiguous (De Grauwe, 1989, p. 157). For example, according to the asset (or portfolio-balance) model an expansionary fiscal policy induced by a reduction in taxes should cause the exchange rate to appreciate. However, assuming both perfect foresight and Ricardian equivalence, agents know that, should the reduction in taxes lead to a fiscal deficit (or increase an existing deficit), the intertemporal budget constraint will force the government to increase taxes in the future to repay debt incurred in the present. If that budget deficit tends to result in an appreciated exchange rate, as in the asset model, then the present value of future budget surpluses has the opposite effect on the exchange rate. Since agents are aware of this outcome, the expected future depreciation will be immediately reflected in today’s exchange rate, preventing the currency from appreciating in the first place (De Grauwe, 1989, pp. 142–144). Introducing uncertainty into the model increases the risks associated with diversification, default, and inflation. Depending upon the relative weight given to those risks, the exchange rate can take a number of paths. (For a discussion, see De Grauwe, 1989, pp. 157–59.)

**The ‘sunk cost’ model.** Krugman (1988) has argued that oligopolistic firms from one country must incur costs to enter and exit other countries’ markets. When decisions are made to incur such costs, exporters will be hesitant to adjust their

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19 That is, economic agents compute the future exchange rate from their forecasts of future exogenous variables and their knowledge of the ‘correct’ underlying model linking those exogenous variables to the future exchange rate. See, for example, De Grauwe (1989).
patterns of specialisation in response to exchange rate movements, and they may even be willing to operate at a loss over the short term if they expect their operations to be profitable over the longer term. As Krugman (1991, p. 17) has stated, an implication of the sunk cost model is that "exchange rates work [but] the lags may be longer than we realized."

(ii) Exchange rate volatility and trade flows. While one strand of the recent literature has stressed the view that exchange rates take considerable time to effect equilibrating changes in trade flows, another strand of the literature has questioned the assumption made by early researchers that exchange-rate volatility hampers trade. On an empirical level, support for the hypothesis that volatility impedes trade performance has been hard to come by. (See Bailey and Tavlas, 1988 and 1991, for overviews of the empirical studies.) Additionally, theoretical work on the issue has shown that the effects of exchange-rate volatility on trade are, a priori, indeterminate.

As pointed out by Bailey, Tavlas and Ulam (1987), exporters may gain knowledge through trade that would help them anticipate future exchange rate movements better than can the average participant in the foreign exchange market. If so, the profitability of this knowledge could offset the risk of exchange rate volatility. If they wish to hedge longer-term investment or other transactions rather than use the forward exchange market, exporters can borrow and lend in local currency to offset their other commitments. For example, a plant in a foreign country can be financed mainly with local capital, so that investors limit their exchange risk in the basic investment. An additional counter-argument of especially great weight is that the alternative to volatility has to be specified — but usually is not. If the volatility is due to fundamental factors influencing the exchange rate, intervention by the authorities to reduce it would be unsustainable and eventually disruptive. To achieve a reduction of apparent, observed volatility, the authorities would have to intervene with exchange controls or other restrictions on trade and payments. That intervention could be more harmful to trade, and reduce it more, than would unrestrained movement of the exchange rate.

Furthermore, volatility of a single exchange rate is a poor measure of the risk of trade with the country involved because of portfolio considerations. In general, a firm will be involved in trade with several countries and so will have a mixed portfolio of foreign claims and obligations. What additional exposure in one country adds to the risk of the portfolio depends on both the variability of the direct bilateral exchange rate and the correlation of that movement with those of other exchange rates. Hence, the effect of exchange rate volatility on trade cannot be determined, a priori.

It is also worthwhile to point out if exchange rate risk can be reduced by pegging exchange rates, this does not mean that risk is not shifted to other variables in the economy. In this connection, Bailey and Tavlas (1988) argue that it is doubtful whether the fixed exchange rate system would have survived the changed world
environment since 1973 without the imposition of controls on capital movements
and restrictions on trade. This view is supported by both the theoretical and empirical
literature. With regard to the theoretical literature, the famous overshooting model
of exchange rate determination demonstrates that, in the face of unexpected shocks,
exchange rates need to overshoot their equilibrium values in order to compensate
for rigidities in product and labour markets. As Frenkel and Goldstein (1986, p. 643)
observe, 'it is precisely because wages and prices are so slow to adjust to current
and expected economic conditions that it is desirable to allow for 'excessive'
adjustment in exchange rates.' With regard to the empirical literature, Fratianni
and von Hagen (1990b) find that, within the European Monetary System (EMS),
the reduction of uncertainty about intra-EMS exchange rates (both nominal and
real) has been accompanied by an increase in EMS uncertainty relative to the major
non-EMS currencies. As a result, Fratianni and von Hagen argue that the potential
welfare gains for EMS countries produced by increased intra-EMS trade, could
be offset by a potential reduction in trade been EMS members and nonmembers,
leaving the overall welfare implication ambiguous.

4. CONCLUSIONS

The 'new' theory of optimum currency areas uses the earlier approach as a point
of departure, stressing the criteria and methodology in choosing a single currency
domain and enumerating the costs and benefits of a single currency. The main
contribution of the new theory can be summarised as follows.

First, the new theory recognises that one of the main costs associated with a
single currency emphasised in the early literature --- i.e., a nation's ability to choose
a preferred point on the Phillips curve --- is not valid (in the long-run). In turn,
the recent literature points out that the neutrality proposition itself is subject to
several caveats; these include the political tensions that emerge in cooperative
monetary unions under conditions of asymmetric shocks, the tendency of such
shocks to exacerbate the business cycle in the peripheral country in hegemonic
unions, and the importance of accounting for such factors as initial positions,
endogenous growth effects, the costs involved with imposing legal restrictions,
and the loss of seigniorage at the national level for countries with an underdeveloped
tax system.

Second in the absence of these caveats, a country under flexible rates can do
little more than choose its desired rate of inflation. Given the costs involved with
high and variable inflation, the time-inconsistency issue indicates that a nation's
monetary-policy credibility can be enhanced by attaching its monetary policy to
that of a country with a low-inflation anchor currency. There are transition costs,
however, associated with the move to monetary integration. These include the
increase in unemployment for the high-inflation country, and the difficulty
encountered by that country in controlling its money supply in light of a rise in capital inflows. Also, the literature has not spelled out in convincing fashion precisely what the economic gains are to the hegemon in asymmetric systems.

Third, the theory of microeconomic decision-making under uncertainty suggests that factor mobility could be reduced in a single currency area due to increased income variability. However, in Bertola's work, income variability is generated through differentiated terms-of-trade shocks; as noted, the recent literature continues to stress the desirability of flexible exchange rates between two countries if they are subject to asymmetric shocks. Consequently, Bertola's work can be viewed as reinforcing the asymmetric-shock argument.

Fourth, in addition, Bertola's results on labour mobility are countered by those of recent work on exchange rate determination and the process of external adjustment, which indicate that the lags between exchange rate changes and trade flows are longer than assumed in the earlier literature. Yet the recent literature also departs from the earlier literature in that recent theoretical and empirical work suggests that short-term exchange rate volatility does not impede trade flows. Thus exchange rate changes take considerable time to correct external disequilibria, but given sufficient time they do work.

Overall, compared with the earlier literature, the 'new' optimum currency area theory indicates that there are somewhat fewer costs (in terms of the loss of autonomy of domestic macro policies), and somewhat more benefits (e.g., gains in inflation credibility) associated with monetary integration. The literature also stresses, however, that pegging alone, without the support of other policy measures, will not suffice to gain credibility. Indeed, such supporting policy measures, particularly monetary policy, are critical in changing public attitudes toward inflation. Further, the literature underlines the need to coordinate fiscal policies, which can be an additional constraint on national policy makers. Finally, the pegged levels of exchange rates associated with monetary integration should, as noted above, not be viewed as immutable. There would be no reason in the first instance to maintain exchange rates among specific currencies if those exchange rates were intended to remain irrevocably fixed.

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THE 'NEW' THEORY OF OPTIMUM CURRENCY AREAS


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