

The European Community as an Optimum Currency Area

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The intensity of debate associated with economic and monetary union (EMU) in the European Community (EC) highlights the core question of how valuable irrevocably fixed exchange rates, or a common currency, would be for its members. This is at heart an economic concern, one to which political objectives and motivations must be compared.¹

In late 1992 the European Monetary System (EMS), before this time viewed as quite stable, became splintered by a series of forced devaluations and withdrawals from the system. Prior to this, and certainly still to a large extent, it was generally agreed that the EMS had worked well to its purpose of establishing a zone of monetary stability in Europe.² It is important to emphasize that the exchange rate mechanism (ERM) of the EMS is not one of fixed rates.³ Instead, what is generally considered to be the institutional base for movement on to EMU was in its earlier years characterized by frequent realignments of exchange rates, while even without realignments the ERM allows for larger (6 percent) or smaller (2.25 percent) margins within which rates may fluctuate, depending upon prior designation for each member country. It is, naturally, arguable that continuation of the flexibility inherent in the EMS⁴ would serve its members better than would EMU and a common currency.

When movement toward a common currency in Europe is addressed, guidance is often sought from what is termed optimum currency area theory.⁵ As noted by Tower and Willett (1976), however, it is probably inappropriate to refer to a single theory of optimum currency areas given the multitude of criteria that have been advanced in the large literature on the subject, and perhaps better to consider an optimum currency area approach to the question of a common currency. Moreover, the discipline has diverted from the original consideration of characteristics that would apply to countries that would make them better or worse candidates for currency union to the nature and source of disturbances that might impact a particular country, or group of countries, and the insulation properties of fixed versus flexible exchange rates.⁶

Optimum currency area theory, in other words, seems to have lost some of the appealing simplicity which made it attractive as a model, a model that promised direct application to policy.

In addition, although initial empirical verification of the approach was encouraging, this body of research was not conclusive, nor was it ever fully developed.⁷ Edison and Melvin (1990, p.8) feel that the underdevelopment is "...owing in part to the difficulty of developing empirically testable hypotheses."

This paper seeks to reexamine one of the seminal papers in this area, both with an eye to extending its vision and encouraging its application to the present concern over whether the individual member states of the EC might benefit economically from a common currency. This revisit, as it were, of an early paper by McKinnon (1963) is seen as anything but exhaustive regarding optimal currency areas; rather, it is an attempt to focus on and examine empirically what might be one perceived benefit to arise from EMU for individual countries within the EC. In this way, a more precise definition of one particular benefit may, in a much broader calculus, be weighed along with other economic as well as the political costs and benefits of the sacrifice of sovereignty involved in accepting a common monetary policy and currency.

Model

Briefly, McKinnon's thesis is that the degree of openness, as measured by the ratio of an economy's tradeables to nontradeables, is important in the choice of the proper policy mix needed to reconcile external and internal balance. His particular contribution is to consider explicitly the increasing impact that exchange rate change may have on price level instability, this in addition to any ineffectiveness such a policy may have on external balance arising from a high level of openness of the economy. Because of the potential impact on the overall price level, in other words, it would be advisable for more open economies to peg their exchange rates to those of their trading partners, and leave it to monetary and fiscal policies to directly deal with external balance through absorption control.⁸

This approach thus provides an explicit and measurable characteristic of countries to aid in their decision to fix or not, or at least to allow for less than full flexibility to their exchange rates. Its use avoids some of the difficulty associated with the application of another notion, factor mobility, that is also associated with the optimum currency area approach, as originally developed in the major contribution of Mundell (1961).⁹ The two, that is openness and factor mobility, are not mutually exclusive, of course, with at least one connection being that capital mobility itself can be expected to be influenced by the degree of exchange rate flexibility. Similarly, diversification, also not unrelated to openness, is not explicitly considered by McKinnon,¹⁰ nor are public finance issues.¹¹ Following the notion of focusing the discussion on openness as related to price stability, this paper will also not comment on the rich literature developed around discipline, and credibility, concerns, nor will it deal with political economy arguments.¹²

Establish a loss function (L) for an economy, with a Lagrange multiplier, defined in terms of the relation between inflation (p), entered here quadratically, and real income growth (y) which falls below the rate of growth of natural real income (y_n), weighted by the importance of the tradeoff (d):

$$1) \quad L = \frac{1}{2} p^2 + d(y_n - y) - T(t + e_1 p_t - e_2 y)$$

The change in the trade balance (t) in equation 1) is effected by a change in the price of tradeables (p_t) and/or income (y). The price elasticity of the trade balance (excess demand for tradeables) is e_1 , while the income elasticity of the demand for tradeables is e_2 . The price change includes implicitly some absorption change (unless there is an entirely dominant supply response to the tradeable price change), which may be supplemented by the impact of monetary-fiscal policy on absorption through a direct reduction in income. The decision thus involves the proper mix of policies (exchange rate and monetary-fiscal) that can minimize the loss function, which explicitly involves the attitude of the economy to any short and medium term tradeoff between inflation and real income growth, as constrained by the reaction of the trade balance to the two policy options.¹³

If b designates the (presumably absorption) weight of the impact of tradeable price changes (again, p_t) on overall price level changes (p), then:

$$2) \quad p = b p_t$$

In equation 2) the term b serves as a measure of the level of openness of the economy, as it reflects the proportion of total absorption composed of tradeables. The more open the economy the closer b approximates the value of one, and the more completely the overall price level is influenced by tradeable prices.

Next, in order to demonstrate the impact that exchange rate devaluation (k) has on prices, let:

$$3) \quad p_t = k$$

The law of one price is, of course, represented in equation 3), as tradeable prices adjust fully to any change in the nominal exchange rate. Also, note that there is nothing in the equation that constrains the system under which the exchange rate is to move. The exchange rate may change either by fiat in the alteration of a fixed rate, or by intervention or market pressure in a system either with established margins, or without them.

Inserting equation 2) into 1), and equation 3) into 1); solving for the impact of exchange rate change and income change on the loss function; and, finally, rearranging terms, yields:

$$4) \quad k = e_1 d / e_2 b^2$$

This parsimonious model¹⁴ can be seen to demonstrate the essential nature of the McKinnon framework for determining the degree of appropriate exchange rate response as part of the adjustment mechanism to external imbalance, with direct inclusion of the impact of exchange rate changes on price instability. Equation 4) indicates that the appropriate rate of exchange rate change depends negatively on the square of the degree of openness. The term b is especially pertinent in that it represents not only the proportion of tradeables in an economy, but in the model it directly measures the impact exchange rate changes can have on the price level through the change in tradeable goods prices. Therefore, openness affects a country's attraction to limiting exchange rate changes because of their potential impact on prices.

Also note that the price elasticity of tradeables enters positively, while the income elasticity enters negatively. The greater the price elasticity of the excess demand for tradeables the more attractive exchange rate changes become, as they have a greater impact on the trade balance, and can imply both a reduction in the size of any necessary realignment as well as a reduced need to curtail absorption directly through countercyclical policies. The greater the income elasticity of tradeable demand, on the other hand, the less the necessary impact on income of any monetary or fiscal policy action, and, therefore, a reduced need to use the exchange rate instrument, with its implications for price level stability.

Finally, from equation 4) it may be determined through the term d that the more critical is the value of maintaining real income in the face of increased inflation, the more the economy will willingly resort to exchange rate changes. This term may be seen to be important given the possibility of quite different acceptance levels of inflation, a point especially applicable to the European experience.

Model Extension

The model represented here, therefore, seems to capture well the nature of the openness criterion as an approach to determining the optimal level of exchange rate flexibility for a country. It shares with much of the literature, however, an inherent problem in application of the criterion. Specifically, it helps to direct a country as to how much exchange rates should be relied upon (again, within the price stability-adjustment context), but it does not give guidance regarding other states with which it should join for an optimal currency area. In other words, the model is implicitly a two-country model.

It is possible to extend the notion of openness, however, to that of open commerce with a country's several trading partners. In this way, it should be possible to delineate which of those partners might make better potential members of a currency union.

Define the loss function as before, but substitute for the price of tradeables a weighted sum of the change in price of tradeables for various countries' goods:

$$5) \quad p_t = \sum_c w_c p_{tc}$$

The way equation 5) is intended to be read is that overall tradeable goods prices are impacted severally by the price changes of goods traded with other countries (p_{tc}). The weight for each country (w_c) thus represents not only the proportion of influence on total tradeable goods prices, but also the level of trade with that country.¹⁵ The greater the level of trade with another country, in other words, the more influence that country has on the internal price level of the original country through its impact on the price of tradeables.

Next, define the price of tradeables with other countries to be directly influenced by the individual exchange rates with those countries:

$$6) \quad p_{tc} = k_c$$

Again inserting equation 2) in the original model into equation 1), and then substituting equation 6) into equation 5), and equation 5) into equation 1) yields:

$$7) \quad L = 1/2 b^2 \sum_c (w_c^2 k_c^2) + d(y_n - y) - T(t + e_1 \sum_c (w_c k_c) - e_2 y)$$

Taking the first differential of equation 7) with regard to the exchange rate with any one particular country (c) as well as with the level of income change, setting the results equal to zero, and solving for k_c yields:

$$8) \quad k_c = e_1 d / e_2 b^2 w_c$$

Equation 8) denotes that the appropriate exchange rate change of a country with one of its trading partners is related to the same variables as before, including the negative relation to the overall level of openness. In addition, however, there is a term (w_c) that indicates a negative relation with the weight of the other country's trade with the original country. Besides openness, and the elasticity and attitude toward inflation

considerations examined above, a country will be less inclined to use exchange rate changes with its larger trading partners. Again, this makes sense, as these countries will have the greater impact on prices of any exchange rate realignment. Here, however, it adds a criterion to the more standard ones which might help direct a country in how to manage its adjustment policies versus individual nations.

Such a standard allows a measure of how to treat some versus others in regard to establishing a potential optimum currency area. Moreover, it may help to explain why some countries in Europe might be more or less anxious to move onto EMU with the entire spectrum of EC countries (including potential new entrants), or might be more satisfied with a currency union composed of a smaller group of countries. Memories of the snake arrangement of the 1970s, which at the end of its existence included a grouping of smaller countries, not all of whom were EC members, around the DM seem pertinent to this notion. Finally, such a concept might shed some light on the political-economic cost-benefit analysis associated with moving toward EMU.

Empirical Results

The earlier empirical work in this area tended to include a wide variety of variables, developed in the optimum currency area approach, as explanatory in the choice of exchange regime.¹⁶ While certainly useful, it may be that such an approach contributed to the lack of focus noted above. There is also the question of how applicable exchange regime results are to the decision of establishing a currency union with a set of particular countries.

The empirical section of this paper, therefore, will concentrate on openness as a criterion for allowable exchange rate flexibility, and, in addition, will extend the concept to openness, or trade, with individual countries in order to determine their attractiveness as currency partners.

As the interest of this study is Europe, and on the EC as an optimum currency area, the data set will be limited to these 12 European countries (with Belgium and Luxembourg already constituting currency union), plus the US and Japan representing external industrialized countries. In addition, the dependent variable will throughout be the coefficient of variation of the pertinent exchange rate over a period of five years, using yearly averages as observations in the coefficient determination. The driving force behind this choice of variable was twofold. First, it was presumed that over the longer run countries choose the level of exchange rate flexibility that they find acceptable. Shorter term measures of exchange rate variability may, of course, diverge from what is considered acceptable, but the sense of the measure is that over the longer term countries are able not only to choose but to control the level of flexibility with which they feel comfortable. Second, such a measure avoids some of the ad hoc nature of attempting to define type of regime

into which countries fall as a dependent variable. In the case of the EMS, for example, it is especially critical not to lump all of the members together, for there is a great deal of variability not only within the bands, but also in the size of the bands themselves. Actual exchange rate variability over a longer period directly reflects, then, the revealed preference of these countries for exchange rate flexibility.

The period under consideration covers the five years from 1986 to 1990, so as to be able to comment upon the current preferences of a group of countries that moved, especially since the French policy decisions of 1983, to a level of commitment to very moderate levels of exchange movement between the members of the EMS. This allows for some beginning analysis on the willingness of these countries to move beyond EMS toward EMU; an analysis that could not so well be based on earlier data from a period of significant and frequent realignments in the system (especially between 1979 and 1985).

The first estimation is one concerning equation 4), which poses a simple negative connection between openness and the degree of exchange rate change. Using the 12 EC member states, Japan and the US, and employing double log OLS for the 1986-1990 period, the coefficient of variation of the exchange rate¹⁷ is regressed on the percentage of imports plus exports of goods and services to 1988 GDP,¹⁸ giving the a2 coefficient in the following (with t statistics in parentheses):

a1	a2	F	R ²
-3.686 (16.891)	-.614 (2.272)	5.16	.301

In support of earlier empirical studies on optimum currency areas using a broader spectrum of countries and a greater selection of variables, openness enters here as a statistically significant variable, at the five percent level.¹⁹

Next, it is possible to extend the model, as in equation 8), to individual EC countries and the degree to which their exchange rate variability with **each** of their EC trading partners over the period is influenced by the level of trade with those same partners. This is done by regressing for each country the log of the coefficient of variation of the exchange rate with each of its trading partners²⁰ on the log of the proportion of total 1988 import trade with those partners.²¹ (Each country's global level of openness, as well as its attitude toward inflation, of course, remains invariant across its trading partners.) The results are presented in Table 1, and they are instructive.

In the table the proportion of trade variable is significant and of the expected sign for six of the 11 countries: Belgium/Luxembourg, Denmark, Germany, the Netherlands and Spain.

Italy is very close to significant at the five percent level, with a coefficient itself well within the range of the others; while Greece carries a significant but positive coefficient. There is some evidence here, therefore, in support of the proposition that not only is openness a criterion that influences the way in which EC countries choose to manage their exchange rates, but also that the proportion of trade with individual countries is important to how exchange rates are managed country by country. This lends, then, empirical support not only to the simple theoretical characterization of the McKinnon criterion, but also to the extension of the criterion to intraregime rate setting. EC economies, in other words, not only appear to prefer less exchange rate variability as their level of openness increases, but also seem to prefer greater fixity with their larger trading partners.

Another interesting result emerges from closer examination of Table 1. The trade coefficient (for those with significant coefficients plus Italy) ranges from a low of $-.280$ for Spain to a high of $-.780$ for Germany. In fact, the progression is: Spain ($-.280$), Italy ($-.348$), Belgium and Luxembourg ($-.423$), Denmark ($-.513$), the Netherlands ($-.694$), and Germany ($-.780$). France, at $-.364$, would fall here between Italy and Belgium/Luxembourg. This relation is suggestive that not only do the coefficients represent the expected negative correlation, but they also reflect the attitudes of the states toward inflation. It will be remembered that the model includes a term for the attitude of a country to inflation, and the willingness to accept a greater degree of income constraint in the adjustment process to external disequilibrium. This seems to be represented in the coefficients on trade (and to some extent the constants as well). Spain, here, again according to these results, is ready to accept a greater degree of exchange rate change than is Germany, presumably due to somewhat less of a concern over the price destabilizing impact of such exchange rate changes.

With an acceptance of this reading of the results, one may then proceed to use the regression equations to determine, from their revealed preferences coupled with the actual proportions of trade for each country, which other EC countries each nation would consider an appropriate candidate for currency union. Using Germany's equation in Table 1, for example, it is possible to enter Germany's actual proportion of trade with the Netherlands in order to decide an acceptable level of longer term exchange rate fluctuation with that country. If this level of fluctuation falls within a suitably narrow range, say, 2.25 percent (borrowed from the smaller band of the ERM), it would seem to constitute at least a country with which one would be tempted to establish pegged rates within a very narrow margin, and perhaps even union.

Table 2 represents the results of this experiment. It shows for each country that carries a significant coefficient (of the correct sign), and Italy (with a t-statistic only .031 off significance at the five percent level), the countries that satisfy the 2.25 percent criterion for exchange rate variation.

The table seems to fit generally some heuristic sense of the partner countries within the EC for optimum currency sharing. It is not surprising, for example, to find some of the smaller northern European countries associated with neighbors which are large trading partners. Belgium/Luxembourg, therefore, is linked here with France, Germany and the Netherlands, while Denmark is associated with Germany and the Netherlands. The Netherlands, again evidencing no little aversion to inflation, and hence by these criteria opening it to more rather than fewer countries for exchange rate linkage, is related in Europe to Belgium/Luxembourg, France, Germany, and the UK.

An important question in the development of the EMS, as well as EMU, is the attraction of some of the larger states to currency union, or at least a peg with fixed and narrow margins.²² In this sample Spain, in fact, has no countries with which it would find it good to associate, probably reflecting a more benign attitude toward inflation, and less to income losses, than the more northern states. Italy is in a similar position, although the level of its trade with Germany evidently outweighs a greater insouciance toward exchange fixing. Incidentally, although France does not possess a significant coefficient, when the standard is applied to France it indicates Germany as a good partner.

Perhaps the most interesting result is that of Germany itself. Given the low tolerance for inflation (as represented by the regression coefficients), within Europe Germany would be open to an area of very reduced exchange rate variation with no fewer than six countries, including Belgium/Luxembourg, France, Italy, the Netherlands, and the UK. Given the self-imposed constraints on both the theoretical and the empirical model in this paper, it is nonetheless significant that such a rationale may be employed to help explain the consistent participation of Germany in the snake arrangement during the 1970s, the fact that Germany was instrumental in establishing and maintaining the EMS even during turbulent years, and, more recently, the willingness of the country actively to consider movement toward EMU, even at the risk of losing sovereignty over the creation of its own currency. Indeed, it is noteworthy that it is here exactly the well-known German concern, over imported inflation, that would actually drive Germany toward EMU, and have it consider establishing a currency union with at least many of its EC trading partners. Another possible interpretation, of course, is that it might be most satisfied with an arrangement where it establishes relatively fixed rates through a disciplined EMS with low margins, and yet still retains its monetary sovereignty.

Finally, two points regarding this approach to the question are worth making. First, it follows from the model in this paper that as intra-EC trade grows (say, following upon the implementation of a successfully expanded single market), a common currency becomes more attractive. Second, the fact that many of the groups reported in Table 2 seem to involve more northern EC states may speak to an inherent willingness within

the Community to establish a two-tier currency structure within Europe.

Conclusion

In conclusion, this paper has revisited one specific criterion for the establishment of an optimum currency area, openness, and assessed its value in addressing the future of EMU among the EC states. Using a simple theoretical construct involving adjustment in general, and the cost of price instability in particular, it is possible to demonstrate not only that openness is a useful guide, but also, through an extension of the model, that the proportion of trade with partner states is an effective criterion for deciding on greater exchange rate fixity with particular nations. A sample empirical analysis applied to recent EC experience reinforces the openness standard, and also demonstrates how several small and large (especially northern) EC countries might be expected to benefit from narrowly fixed exchange rates, or, perhaps, even currency union. Whether or not this economic benefit, coupled with other economic and political benefits, is viewed as adequate to outweigh other economic and political costs, is, of course, the key question in a much broader analysis of whether or not there might eventually be a single currency for much of Europe.

Table 1

EC Exchange Rate Variation on
Trade Proportions by Country
(period 1986-1990)

Country	a1	a2	F	² R
Belgium/Lux	-4.845 (6.591) **	-0.423 (2.235) *	4.99	0.333
Denmark	-5.128 (7.114) **	-0.513 (2.716) **	7.38	0.425
France	-4.432 (6.158) **	-0.364 (1.793)	3.22	0.243
Germany	-6.047 (5.066) **	-0.780 (2.296) *	5.27	0.345
Greece	-1.676 (7.769) **	0.140 (2.345) *	5.50	0.355
Ireland	-1.776 (8.274) **	0.061 (1.158)	1.34	0.118
Italy	-4.373 (7.147) **	-0.348 (2.148)	4.61	0.316
Netherlands	-5.886 (6.333) **	-0.694 (2.837) **	8.04	0.446
Portugal	-2.557 (11.185) **	0.008 (.140)	0.02	0.002
Spain	-3.799 (8.411) **	-0.280 (2.273) *	5.17	0.341
UK	-3.369 (6.246) **	-0.218 (1.410)	2.00	0.166

a1 = constant; a2 = proportion of imports with trading partner

t statistics for coefficients in parentheses (* 95 percent significance; ** 99 percent)

Table 2
EC Currency Groupings

Country	Associations
Belgium/Lux	France; Germany; Netherlands
Denmark	Germany; Netherlands
France	(Germany)
Germany	Belgium; France; Italy, Netherlands, UK
Greece	(no guideline)
Ireland	(no guideline)
Italy	Germany
Netherlands	Belgium; France; Germany; UK
Portugal	(no guideline)
Spain	none
UK	(no guideline)

Table based on size of trading partner entered in country equations from Table 1 (see text for explanation). No guideline for a country follows from lack of a significant relationship.

Notes

1 Feldstein (1992), for example, maintains that the question should be reversed from whether the political costs of EMU outweigh the economic gains to whether the political gains outweigh the economic costs. For the official view see Commission of the European Communities (1990).

2 It is a heavily debated point in the literature on the nature and reason for this perception of success, with a good deal of the debate centering more on the reduction and convergence in inflation rates than on the reduction of exchange rate variability. See, for a summary, Kaufmann and Overturf (1991), and, for some recent contributions to the debate, Fratianni and von Hagen (1990) and Froot and Rogoff (1991).

3 See, on this point, Wihlborg and Willett (1990).

4 Or expandable, considering a proposal to widen the bands.

5 See Tower and Willett (1976) and Wihlborg and Willett (1990), and the sources referred to in those works, for surveys. For more recent applications of the approach to Europe see Thygesen (1987), Kaufmann (1989) and Eichengreen (1989).

6 See Edison and Melvin (1990).

7 The Commission of European Communities (1990, p. 46) finds that "Empirical applications of this [optimum currency area] approach are scarce and hardly conclusive."

8 Corden (1972), similarly, treats currency union through consideration of the increased price stability offered by fixed exchange rates, and the impact on trade as well as protection for those countries averse to inflation, whereas McKinnon is concerned somewhat more with the usefulness, or liquidity value, of money. Corden's discussion of the possibility of insulation of an economy to the instability of foreign prices (through flexible rates) is especially interesting.

9 See Commission of the European Communities (1990, p.46) for some of the problems in application of the mobility criterion, especially to the case of the EC.

10 Although interindustry trade mobility, as well as more general factor mobility, is.

11 See, for example, Canzoneri and Rogers (1990).

12 For more on the latter, see Burdekin, et.al. (1991).

13 An implicit assumption here is some degree of short and medium term wage and price inflexibility, or else there would be little need for the discretionary macroeconomic policy response. On this point see Burdekin, et.al. (1991). Also, even though it is perhaps easiest to imagine the response called for in the policy decision to be in reaction to an external real shock affecting the trade balance, there is no reason policy makers would not be faced with a similar dilemma in reaction to an internal policy shock created by the authorities themselves. Thus, a Barro-Gordon style engineered surprise inflation would then require a policy response to deal with the trade implications of the prior policy decision.

14 For which both the first and second order conditions for a minimum are satisfied.

15 There is introduced in this construct a level of independence of the markets for goods from specific countries.

16 See specifically the papers by Heller (1978) and Holden, Holden and Suss (1979). Edison and Melvin (1990) note the empirical tension between testing for source of disturbance versus overt country characteristics.

17 The nominal effective exchange rate over the five years, from IMS (1991).

18 From the national accounts in IMS (1991).

19 Again, see Edison and Melvin (1990) for reference to source of disturbance empirically dominating openness and other optimum currency area approach characteristics. Also, a run of the same equation here, but using a broader grouping of OECD countries increased the t-statistic for openness to 2.900. With attention to missing variables the equation was also run including a proxy for the "d" term in equation 4), as the difference in the inflation rate of each country from the average inflation rate for the population. Neither did the coefficient change in value or in significance, nor was the new term significant. Also, the influence of price and income elasticities, again represented in equation 4), is expected to be captured in the openness variable. The expectation is, reinforcing the way in which they enter in the equation, that price elasticities drop while income elasticities increase with openness. See Tower and Willett (1976).

20 Period averages of market rates run through the US dollar over the five years, from IMS (1991).

21 Data from intra-Community trade and total imports tables as contained in European Communities (1990). Export data are not included by country in this source.

22 In a somewhat similar vein Thygesen (1987, pp. 167-8) finds it easy to explain why the smaller European states have chosen to manage their exchange rates, as they "...are all very open by the McKinnon criterion," and yet finds that it does not explain why some of the "...larger European countries have chosen to set up the EMS in preference to less complex methods."

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Abstract

This paper reexamines and extends the concept of openness as a criterion for optimal currency areas to the European Community. The results from theoretical representation and empirical analysis speak to the value of the openness criterion as important in the degree to which EC countries allow their rates to vary within the confines of the European Monetary System. An extension of the theory allows for the conclusion that countries will be less inclined to use exchange rate changes with their larger trading partners. This gives, in turn, a standard countries might use to manage their adjustment policies with individual nations. Empirical examination of the EC yields country groupings among smaller northern European countries, and also helps to explain why Germany might be willing to consider economic and monetary union.