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# Does Mercosur Need a Single Currency?<sup>1</sup>

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## 1. The Issues

The macroeconomic turbulence that accompanied the formation of Mercosur makes it seem truly remarkable that the four countries involved in fact succeeded in taking this momentous step toward regional integration. No sooner was the free trade area formed than Argentina launched its Convertibility Plan. Inflation came down from well over 1,000 per cent to little more than one per cent per annum, and the real economy entered a three-year period of rapid growth.<sup>2</sup> The real exchange rate vis-a-vis Brazil, Argentina's main Mercosur partner, appreciated sharply (Figure 1), and Argentina's bilateral trade surplus with Brazil sunk deep into deficit (Figure 2). Starting in 1992, the authorities in Argentina responded by imposing anti-dumping duties and safeguarding measures against Brazilian exports of farm machinery, spark plugs, steel, refrigerators, paper, textiles and chemicals. In 1994 the tables turned. Brazil launched the Real Plan, introducing its new currency on July 1<sup>st</sup> and bringing down inflation from more than 1,000 per cent to the low double digits. As in Argentina three years before, the economy boomed. But now it was the turn for the Brazilian currency to appreciate against that of

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<sup>1</sup> Keynote address for the IPEA conference "ALCA and MERCOSUL: The Brazilian Economy and the Processes of Subregional and Hemispheric Integration," Brasilia, October 5-6, 1998.

<sup>2</sup> Annual growth rates exceeded 7 per cent per annum from 1991 through 1994.

its principal Mercosur partner and for the bilateral trade balance to swing sharply in Argentina's favor, to the discomfort of Brazilian firms, particularly those producing automobiles and other consumer durables in competition with exporters to their west. In early 1995 the authorities in Brasilia raised tariffs, imposed import quotas, and restricted the availability of trade credit in order to limit the impact of surging Argentine exports on Brazilian producers.<sup>3</sup> Yet despite this macroeconomic turbulence and these setbacks on the road to free trade, regional integration has made significant progress.

One conclusion that might be drawn from this experience is that macroeconomic policies and performance in the countries participating in a free-trade area are quite irrelevant to the solidarity of their commercial arrangement. In this view, the doubling of the share of intra-Mercosur trade in the total trade of the four member countries over its first five years, in the face of dramatic macroeconomic divergences, puts paid to the notion that a vibrant and successful free-trade agreement requires the harmonization of macroeconomic and exchange-rate policies.

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<sup>3</sup>To describe in the text how this dispute, centered on the automobile and automotive parts industry, played itself out would divert us from our main point. Briefly, the two countries negotiated a bilateral agreement under which Brazil exempted cars assembled in Mercosur from its tariff increase but required the maintenance of other restrictive measures until the year 2000. Companies with plants only in Argentina are entitled to ship a specified quantity of exports to Brazil while paying only half the prevailing rate of tariff. Companies with plants in both Argentina and Brazil are exempted from the tariff in return for a commitment to run balanced bilateral trade between the two countries.

The other potential conclusion, of course, is that Mercosur survived the period only by dint of a number of exceptional — and exceptionally propitious — conditions.<sup>4</sup> First there was the fact that trade between the free-trade area's principal members started out from unusually low levels. Import surges hurt, but the pain was assuaged by the fact that import competition was so low at the start. Second there was the fact that these import surges occurred against the backdrop of unusually rapid growth in the country adversely affected. Rapid growth papers over many ills and makes possible policy reforms that would be unsupportable otherwise. And third there was the fact that the global environment was propitious. The world economy was growing. The imports of other regions were growing. Foreign finance was readily available courtesy of the low level of interest rates in the major money centers. The Tequila crisis interrupted this bliss, but it affected mainly Argentina precisely in the period when that country was being helped by the surge of exports to Brazil.

The plausible inference to draw from this view is that macroeconomic disharmony and exchange-rate fluctuations will be more disruptive in the future than the past. Growth will not continue forever at an annual rate of seven per cent. Tightening global credit conditions can make domestic adjustment more painful, as we have already seen following the onset of the Asian crisis. The rapid growth of intra-regional trade, which is now more than four times its 1991 level in dollars, means that formerly second-order effects have now assumed first-order importance. That we have not yet seen these chickens come home to roost in the form of a serious protectionist backlash may once again reflect exceptional and temporary circumstances.

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<sup>4</sup>One expression of this view is Bouzas (1997).

Inflation has been running at reasonably similar rates in Argentina and Brazil. The real exchange rate between the two countries has been reasonably stable, the tendency for the Real to appreciate in real terms due to somewhat higher inflation in Brazil having been offset by the fact that the Peso is rigidly pegged to a strong and strengthening U.S. dollar. But who knows whether such propitious conditions will persist? Now that the Asian crisis has infected financial markets worldwide, including those of Latin America, one cannot help but wonder whether the answer to this question will have changed by the time these words are transmitted from my computer to the desks of conference participants.

For all these reasons, the issue of whether Mercosur needs closer macroeconomic policy harmonization, and in particular an exchange-rate stabilization agreement or even a single currency, is back on the table. In fact, it has been back for some time, authors like Roberto Lavagna and Fabio Giambiagi having advocated a Mercosur monetary union in a series of articles, and President Menem having raised the idea last December and again at the regional summit this last June.<sup>5</sup> The politicians may have mixed motives, to be sure. Some in Argentina may be interested in a single Mercosur currency as an exit strategy from the Convertibility Plan, while some in Brazil may see it as that country's salvation from large budget deficits and the specter of a disorderly devaluation. But, as I argue below, there is a coherent political-economy logic for why the members of the customs union might contemplate a common currency. In doing so, however, they should bear in mind that the list of preconditions for a single currency to operate smoothly is rather formidable, and it is not clear that the members of Mercosur union are

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<sup>5</sup>I have in mind Giambiagi (1997, 1998), Lavagna and Giambiagi (1998) and Edwards (1998), among others.

prepared to satisfy them.

## 2. Three Views of the Links Between Exchange Rates and Regional Integration

When assessing the need for and feasibility of measures to stabilize exchange rates among the members of a regional arrangement, it is important to be clear about why one thinks currency fluctuations matter. One view is that exchange-rate variability disrupts trade and market integration. It complicates price comparisons, requires importers and exporters to incur the extra costs of hedging, and reduces the volume of intra-regional trade. This has long been the official position of the European Commission and others when advancing the argument that the Single European Market needs a single currency.<sup>6</sup> Indeed, there is some empirical merit to their position. As the literature on exchange-rate variability and trade grows increasingly refined and sophisticated, there does appear to be an emerging consensus that there is a statistically significant, if relatively small, negative impact of exchange-rate variability on trade.<sup>7</sup> Recent studies suggest that the U.S. and Canadian markets are significantly less integrated with one another than are the different U.S. states, this despite the virtual absence of tariff and nontariff barriers to trade between the two countries, suggesting that their separate currencies do in fact pose a non-negligible barrier to trade.<sup>8</sup>

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<sup>6</sup>See Emerson et. al (1990) for a clear expression of the Commission view.

<sup>7</sup>See for example Frankel and Wei (1993) or Holly (1995).

<sup>8</sup>See McCallum (1995) and Engel and Rogers (1996). Whether these differences between cross-border trade on the one hand and trade between Canadian provinces or U.S. states on the other really reflects the effects of separate currencies, as opposed to other policies, is a question to which I return below.

This evidence does not suggest any fundamental incompatibility, however, between regional integration and the maintenance of separate national currencies possibly fluctuating against one another. All it suggests is that trade between Argentina and Brazil may never grow as intense as trade between pairs of Argentine provinces or pairs of Brazilian states. This is not a disaster. It is not a dire threat to South America's customs union. It is by no means incompatible with regional integration.

A second view of why an integrated economic zone needs stable exchange rates or even a single currency is that exchange-rate swings unleash import surges that antagonize concentrated interests. The adversely-affected interests lobby for countervailing duties and hence against the maintenance of regional free trade. In this view, separate national currencies, insofar as they make exchange-rate variability an unavoidable fact of economic life, are dangerously corrosive of political support for regional free trade. They are fundamentally incompatible with market integration not because they complicate price comparisons or introduce costs of hedging but because they produce exchange rate swings, import surges and, ultimately, a protectionist backlash. This is the other argument for why Europe's Single Market created irresistible pressure for a single currency. Support for it can be found in the protectionist backlash in France and elsewhere in Europe following the depreciation of sterling and the lira in the latter part of 1992.<sup>9</sup> Further support is evident in the backlash against hemispheric integration in the United States, especially in the U.S. South West, following the depreciation of the Mexican peso and the surge of U.S. imports from South of the border in 1995. Support can also be found in the trade conflicts between Argentina and Brazil between 1992 and 1995.

A third view is that all this is hogwash -- that there is no incompatibility between regional integration and fluctuating exchange rates. The North American Free Trade Agreement, in this view, cements the case. The exchange rates between the three NAFTA countries continue to fluctuate widely. In recent months, for example, both the Canadian dollar and the Mexican peso have depreciated significantly against the U.S. dollar, reflecting the global slump in primary-commodity prices. Trade tensions may arise from time to time, but no one is threatening to back out of NAFTA. There is no serious talk of a single currency for North America, or of Canada and Mexico adopting the U.S. dollar. Rather, exchange-rate fluctuations within the region reflect shifts in the international competitive position of the three participating countries, in particular the relatively heavy dependence of Canada and Mexico on the production and export of primary commodities. To remove the exchange rate as an instrument of adjustment within the free trade area would be to shut off one of its few remaining safety valves.

### 3. Reconciling the Perspectives

In fact, there is no real incompatibility between these views. Whether or not exchange rate movements threaten regional integration depends on two things: the depth of that integration, and the source of the disturbances in response to which the exchange rate moves.

**Depth of Integration.** A sharp exchange rate swing is more likely to provoke a political backlash against regional integration when policy makers are seeking to create a truly unified regional market, not when integration stops at the border — that is, when it is limited to the creation of a free trade area or a customs union. The deeper is integration, the higher will be the

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<sup>9</sup>As documented in Eichengreen and Ghironi (1996).



cross-price elasticity of demand for similar products produced in different parts of that integrated market, and the more intense will be the political dislocations associated with a sudden shift in the exchange rate. Tariff barriers between the three NAFTA partners may be minimal, but there remain a variety of subtler restrictions on cross border trade: different public procurement rules in different countries, differential access to the domestic distribution system, and different degrees of government subsidization for public enterprises and national champions. A change in the exchange rate between the two dollars, for example, will affect the relative competitiveness of U.S. and Canadian producers across a wide range of industries, but import-competing firms will still enjoy some limited protection courtesy of a variety of regulatory impediments to trade. The pressure they experience will be correspondingly less intense.

In the European Union, on the other hand, the goal of the Single Market is to eliminate these hidden obstacles to cross-border competition and to put producers selling into, say, the French market on an even footing whether they are located in France or in any one of the other 14 EU countries. The European Commission is empowered, therefore, to require governments to rescind measures favoring their domestic producers. It has (not always successfully, but increasingly) challenged subsidies for domestic champions, government procurement practices that favor domestic producers, health and safety regulations that favor some producers over others, and restrictions on the ability of foreign truckers to use domestic roads. The power to determine whether governments can restrict the purity of the beer or the pasteurization of the cheese having been delegated to the Commission (not without resentment, to be sure), competition among producers has become correspondingly more intense. In such an environment, a change in the exchange rate that arbitrarily shifts competitive advantage from one

set of national producers to another can have powerful effects on profitability and understandably provokes a strong reaction.

It follows that supplementing regional integration with an initiative to stabilize the exchange rate or move toward a single currency becomes more urgent when integration moves beyond the establishment of a free trade area or a customs union to the creation of a deeply integrated market. Citizens of my own country — indeed, my own state — will appreciate the point. It is hard to imagine the successful maintenance of political support for free interstate commerce between the 50 U.S. states if there existed 50 state currencies fluctuating against one another. At the beginning of the 1990s, when California suffered a more severe recession than the rest of the country, it might have benefitted from possessing a separate currency which it could have depreciated against that of the other 49 U.S. states. But it is not hard to imagine the reaction of the other 49: they would have screamed bloody murder about unfair currency manipulation and exchange dumping by a desperate government in Sacramento and slapped countervailing duties on exports from California.

**Nature of the Disturbance.** When the exchange rate of one's customs-union partner depreciates because of the deteriorating competitiveness of producers in that country, and when that adjustment is gradual, there should be little political reaction. Thus, when a country experiences relatively rapid inflation that would otherwise price domestic producers out of international markets, some downward adjustment in its exchange rate will be necessary to restore the initial equilibrium. When a country like Canada which depends very heavily on exports of primary commodities is hit by a decline in world commodity prices, its exchange rate must adjust downward to reduce domestic costs of production (valued at world prices, since it is

in world markets that commodity prices are set). Again, the change in the exchange rate just restores the initial equilibrium and should not provoke a political reaction. These are simply instances of the exchange rate playing its textbook safety-value role.<sup>10</sup>

In reality, things do not always work this way. If the exchange rate has been pegged as a centerpiece of the authorities' economic policy strategy and now has to be adjusted because one or another of the aforementioned problems has rendered its previous level unsustainable, that adjustment will be a shock to confidence even if it is a consequence of events that were no fault of the government's own. Typically, interest rates will have to be hiked until investor confidence turns. For this and other reasons, a recession may follow. As an increased share of domestic production is shifted toward export markets, the country's customs-union partners will experience the adjustment not as a smooth return to an initial equilibrium but rather as a contractionary devaluation with negative repercussions abroad. Domestic producers experiencing more intense import competition will not be happy with this result.

And, of course, if the change in the exchange rate is engineered by the foreign country to steal a competitive advantage rather than to correct an initial disequilibrium, it is even more likely to provoke a political backlash abroad.

**Implications for Mercosur.** Thus, whether one believes that Mercosur needs a regional exchange-rate-stabilization agreement or a common currency depends first on what kind of integrated regional market its architects are building. A customs union like NAFTA, in which integration is limited to the removal of tariffs and other barriers at the border, can be sustained

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<sup>10</sup>Indeed, if the exchange rate and domestic prices move smoothly and in tandem, as in the more classical versions of the model, equilibrium will never be disturbed.

despite the existence of separate national currencies with exchange rates that fluctuate against one another. But deeper integration, extending to the harmonization of domestic regulations of all kinds, a la the European Union, implies even more open domestic markets and more intense cross-border competition, making exchange-rate changes more disruptive. If South American policy makers are prepared to stop at the customs-union stage, then exchange-rate fluctuations matter less. If they intend to press ahead to deeper integration, then they, like their European counterparts, will also have to contemplate monetary integration.

Some will object that the NAFTA solution is not feasible for Mercosur because Brazil is not the United States. The U.S. is both far and away the largest member of the North American Free Trade Agreement and a bastion of monetary stability. Fluctuations in the exchange rate of the Canadian dollar and the Mexican peso are not inconsequential for the United States, but the consequences are tolerable because the Mexican and Canadian economies are so small relative to the American. And fluctuations in the exchange rate of the U.S. dollar, while not inconsequential for Canada and Mexico, are acceptable so long as U.S. monetary policy remains on a sound and stable footing. Brazil neither dominates Mercosur to the same extent, nor does it have a comparable track record of monetary stability. Both objections are valid, of course. Because Brazil's Mercosur partners are large enough to have a first-order impact on its economy, exchange rate fluctuations emanating from those other countries are likely to make exchange rates a touchier issue than they are in NAFTA.<sup>11</sup> And if the largest country in Mercosur fails to

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<sup>11</sup>Actually, the contrast with the United States should not be overdrawn. Purchasing-power-parity weights for 1995 suggest (according to the World Bank's *World Development Report*) that whereas the U.S. accounted for 85 per cent of NAFTA GNP, Brazil accounted for fully 72 per cent of that of Mercosur.

follow stable monetary policies, the repercussions for the cohesion of the customs union could be quite serious. But if Brazil fails to follow stable monetary policies, alternatives to variable exchange rates are not viable either.

#### 4. Is Exchange Rate Variability within Mercosur a Problem?

How much exchange-rate variability is too much? This is not a question that can be answered in the abstract. Some metric, or basis for comparison, is required. As a basis of comparison for the Mercosur countries, I use the levels of exchange-rate variability typical of advanced-industrial countries and other middle-income developing countries with broadly similar characteristics.

What characteristics of countries should be considered when estimating how much exchange-rate variability is economically and politically acceptable? Here I build on some previous work with Tamim Bayoumi drawing on the theory of optimum currency areas.<sup>12</sup> Contributions to the literature on optimum currency areas (OCA literature for short), starting with Mundell (1961), point to characteristics of countries that make stable exchange rates and/or monetary unification more or less desirable. Among the most important of these characteristics are:

- *Asymmetric output disturbances between a given pair of countries.* The greater the asymmetry of output movements, the higher the value placed on changes in the exchange rate as an

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<sup>12</sup>Eichengreen and Bayoumi (1996), Bayoumi and Eichengreen (1997).

instrument of relative price adjustment. Empirically, we measure output disturbances as the standard deviation of the change in the log of relative output in two countries. Thus, for countries in which business cycles are symmetric and outputs move together, the value of this measure is small.

•*Dissimilarity of the commodity composition of production and trade.* When the commodity composition of production and trade is very different across two countries, sector-specific shocks are likely to affect them very differently, placing a premium on exchange-rate variability. This is the determinant of preferences for exchange-rate stability emphasized by Kenen (1969). To construct this variable, we collected data on the shares of manufactures, food, and minerals in total merchandise trade for each country. The dissimilarity of any two countries' exports was then defined as the sum of the absolute values of the differences in each share, so that higher values indicate less similarity in the composition of exports.

•*Trade linkages.* The more two countries trade, the more they will value bilateral exchange rate stability which minimizes relative price disturbances disruptive to commerce between them. Empirically, we measure the importance of bilateral trade as the average value of exports to the partner country, scaled by GDP, for each pair of countries concerned.

•*Size.* Small countries benefit the most from the unit of account, means of payment and store of value services provided by a common currency or a stable exchange-rate link. Indeed, the tendency for small countries to opt for pegged exchange rates would appear to be one of the few

robust findings from the literature on choice of exchange-rate regime.<sup>13</sup> We measure these benefits of a more stable currency by the arithmetic average of the log of real GDP in U.S. dollars of each pair of countries.<sup>14</sup>

To operationalize these insights from OCA theory, we regress the variability of bilateral real exchange rates for a sample of country pairs on these four measures for each set of partner countries. OCA theory predicts that exchange rate variability should rise with the asymmetry of output movements, the dissimilarity of exports and country size (the signs on these three variables should be positive), while falling with trade linkages (the sign on this variable should be negative). Previously, we estimated the model for an extended European sample of 20 countries (to gain insight into the implications of European monetary unification) and for Japan and 19 of its leading trading partners (to shed light on the advisability of a collective exchange rate peg in Asia). Here, the sample is extended to include the Mercosur countries, and the results including these observations are compared with those limited to the non-Mercosur countries for various periods of time. If exchange rate variability among the Mercosur countries is significantly higher than that between other countries with otherwise comparable characteristics, then there is a strong presumption that observed levels of currency variability within Mercosur are a problem.

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<sup>13</sup>See Honkapohja and Pikkarainen (1992).

<sup>14</sup>The obvious alternative, suggested by McKinnon (1964), is to look at openness instead of (or in addition to) country size. Both Honkapohja and Pikkarainen (1992) and Bayoumi and Eichengreen (1997) find that this variable has surprisingly little additional explanatory power when added to a regression that already includes country size (and that it does not diminish the importance of the economy-size variable).

There are some caveats and problems to worry about before taking these results at face value.

•*Endogeneity.* Frankel and Rose (1996) highlight the possible endogeneity of the optimum currency area criteria. In particular, the correlation of business cycle disturbances across countries, or the level of bilateral trade, might itself be significantly affected by the extent to which governments succeed in stabilizing the exchange rate. (It would be a stretch to make similar arguments for country size or export composition, at least over the limited time span considered here.) Bayoumi and Eichengreen (1998) instrument these variables, drawing instruments from the gravity model (which seeks to explain the bilateral trade whose endogeneity is of potential concern here in terms of the distance between each country pair, contiguity, and common language). Reassuringly, the instrumental-variables estimates are little different from those reported here.

•*Stability.* There is reason to worry that the relationship between exchange rate variability and country characteristics will shift over time, especially for the Mercosur countries, whose economic circumstances and international economic policies have changed so dramatically over recent years. To get at this question, I undertake extensive sensitivity analysis, reporting results for various subperiods: 1973-82, 1983-96, and 1990-96.

•*Omitted variables.* There is always the worry that a particular set of countries display higher or lower exchange rate variability than predicted because of the influence of other characteristics



omitted from the model. An obvious example for the Mercosur countries is that they now prefer relatively stable exchange rates, although have actually experienced relatively unstable exchange rates, because of their historical predisposition to high inflation.<sup>15</sup> Looking forward, however, the relevant question is whether the Mercosur countries, as they join the club of economies with a tradition of price stability, will then come under pressure to take additional measures to achieve greater exchange rate variability. That is the question the regressions here are designed to address.

•*Independence of observations.* A possible technical concern, given that the data set is composed of the entire network of bilateral exchange rates for the sample of countries considered, is that not all of the observations for the dependent variable are independent of one another. But while it is true that changes in bilateral exchange rates are not independent (given triangular arbitrage), the standard deviations of these rates are independent because covariances differ across pairs of countries.

•*Real versus nominal exchange rates.* Real exchange rates matter for relative prices, but governments control (or can attempt to control) only nominal exchange rates. As is well known, however, the two variables are highly correlated: contrary to the predictions of purchasing-power-parity theory, the variability of the nominal exchange rate is a strong predictor of the

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<sup>15</sup>Bayoumi and Eichengreen (1997) confirm that country pairs across which the relative rate of growth of money supplies is more variable tend to have more variable exchange rates.

variability of the real exchange rate.<sup>16</sup> In the present context it turns out to be a matter of indifference whether one analyzes the determinants of real or nominal exchange rate variability. For simplicity I concentrate on the results for real exchange rate variability in the text and report those for nominal exchange rate variability in the appendix.

The upper-left-hand panel of Table 1 shows the basic results for the extended European sample (as in Bayoumi and Eichengreen 1997).<sup>17</sup> All four variables enter with their expected signs and with coefficients that differ significantly from zero at the 99 per cent confidence levels. Larger countries, countries with unusually asymmetric business cycles, and countries whose exports are highly similar to one another's tend to prefer more exchange rate variability, while countries that trade more with one another tend to prefer more stable exchange rates. The upper-right-hand panel shows analogous results for Japan and its trading partners, over a somewhat longer period to compensate for the existence of missing observations (as in Eichengreen and Bayoumi 1996).<sup>18</sup> Again, all four OCA variables enter with their predicted signs, although the coefficient on the composition of exports is much smaller and no longer differs significantly from zero at standard confidence levels. Business-cycle synchronization matters a bit more than for the OECD as a whole, and the extent of bilateral trade and economic

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<sup>16</sup>See for example Mussa (1979).

<sup>17</sup>The sample of countries for these regressions is Germany, France, Italy, the UK, Austria, Belgium, Denmark, Finland, Greece, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Australia, New Zealand, Japan, Canada and the United States.

<sup>18</sup>In this case the country sample is Australia, Belgium, Canada, France, Germany, Indonesia, Italy, Korea, Malaysia, the Netherlands, New Zealand, the Philippines, Singapore, Spain, Thailand, the United States and the United Kingdom, along with Japan.

size appears to matter less, but the overall fit is only slightly less satisfactory than that for the OECD.

The lower-left-hand panel consolidates the data for these two previous samples and adds that for the Mercosur countries, estimating the model for the 1973-82 subperiod. Again the model does a good job of explaining bilateral exchange-rate variability: all four variables enter as predicted, the extent of bilateral trade is significant at the 95 per cent level, and the other variables are significant at the 99 per cent level. The panel to its right shows that the soon-to-be Mercosur countries had unusually variable exchange rates even in this earlier period. “DMERC” is a dummy variable taking on a value of unity when both the countries in a given pair are present-day Mercosur members. The effect is large: the magnitude of the coefficient on this dummy is twice the size of the mean of the dependent variable.

The three panels of Table 2 contrast the results for the more recent (1983-96) period and the entire sample of countries. Again, the model fits rather well, if anything better than in the earlier period.<sup>19</sup> As in the earlier period, the dummy variable for pairs of Mercosur countries enters positively and with a statistically significant coefficient, now on the order of 1 ½ times (down from two times) the standard deviation of the dependent variable. The bottom panel of Table 2 interacts the entire vector of country characteristics (as well as the constant term) with the dummy variable for pairs of Mercosur countries. In other words, I ask what country characteristics associated with a preference for exchange rate stability elsewhere in the world do not appear to deliver that result in the Southern Cone. It turns out that all the country characteristics pointed to by the theory of optimum currency areas behave differently within

Mercosur than elsewhere.<sup>20</sup> The tendency for large countries to tolerate greater exchange rate variability is especially prominent within Mercosur; this, obviously, is the Brazil effect -- a reflection of that country's exceptional behavior. The tendency for countries experiencing booms and bursts at different times to prefer greater exchange rate variability is less pronounced within Mercosur than elsewhere; if anything the opposite is true. This presumably reflects the extent to which the exchange rate was used as a nominal anchor in disinflation episodes rather than for standard business-cycle-smoothing purposes. Finally, the tendency for countries with similar exports to prefer stable exchange rates is stronger within Mercosur than elsewhere. Why is not clear, although one might posit that the tendency for close export competition to raise political hackles creates particularly strong pressure for exchange-rate stabilization within the grouping. The fact that the association between bilateral trade and exchange-rate stability is even stronger among the Mercosur countries than elsewhere is consistent with this interpretation.

Finally, I report the same results for the 1990s (Table 3). The basic results are little changed: the signs and significance of the OCA variables and the Mercosur dummy are the same as before, and the latter remains about 1 ½ times the standard deviation of the dependent variable. The version of the model with the complete vector of interaction terms suggests that it is mainly in the stronger association between exchange rate variability and economic size and the weaker effect of exchange rate variability and asymmetric business cycle fluctuations that the Mercosur countries differ from the rest of the world. Again, this points to the importance of

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<sup>19</sup>Note the rise in the adjusted  $R^2$  from 0.23 to 0.54.

<sup>20</sup>Here I concentrate on the results for the 1983-96 subperiod, although those for the longer time span differ little in their essentials.

Brazil and to the importance of exchange-rate-based stabilization.

These interpretations are confirmed by the scatter plots in Figures 3 and 4, where actual exchange rate variability is plotted against that predicted by the various models. Most of the Mercosur-pair observations, denoted by diamonds, are to the right and below the line where actual and predicted are equal. Note that the Mercosur pairs tend to fall into two clusters, one of relatively high and one of relatively low variability. For the sample period 1983-96, the high variability observations are those for Argentina and its Mercosur partners, reflecting the effects of that country's high inflation and succession of failed stabilization attempts prior to 1991. When the sample period is limited to the 'nineties, they are those for Brazil and its Mercosur partners, again reflecting the exchange-rate disruptive effects of high inflation and sudden stabilization.

Thus, if the Mercosur countries are to reduce real exchange rate variability within the region to levels consistent with those displayed in the first half of the 1990s by other countries broadly sharing the same economic characteristics, this means cutting the variability of the real rate by something on the order of 60 per cent. According to the analysis of nominal exchange rates in the appendix, this means cutting the variability of nominal exchange rates by something on the order of two-thirds relative from 1990-96 levels. The political economy interpretation given in Section 2 suggests that this is necessary in the long run to maintain political support for the levels of openness and trade concentration characteristic of other advanced-industrial and industrializing countries.

## 5. Feasible and Infeasible Solutions

How, then, might greater exchange-rate variability be achieved? Posing this question directs attention to the immense literature on alternative exchange rate regimes, exchange rate determination, and exchange rate management. Inevitably, discussion is complicated by the fact that there is no consensus on basic questions like how exchange rates are determined, what causes currency crises, and whether policies like sterilized intervention can influence the level of the exchange rates. Here, in any case, is one economist's attempt to cut through this analytical thicket.

Countries can and do continue to operate a variety of different exchange rate regimes, ranging from rigid currency-board pegs on the one hand, a la Argentina, to essentially free floats on the other, a la the United States. Traditionally, the majority have sought to operate some kind of intermediate arrangement combining elements of floating and fixing. The exchange rate is managed but allowed to fluctuate over some limited interval. Viewed from the other end, while the exchange rate is allowed to fluctuate, policy is used to influence its level.

Rising international capital mobility is, however, making these intermediate, or hybrid, arrangements more difficult to operate. The growth of private capital markets has exposed the small scale of official reserves relative to private liquidity. Meanwhile, the revolution of information and communications technologies has made it very much more difficult to stop capital inflows and outflows at the border. For both reasons, private markets immensely complicate the task of seeking to operate pegged but adjustable exchange rates, target zones, crawling bands, and similar compromise arrangements. In the presence of internationally mobile capital and liquid markets, a nascent overvaluation is quicker to give rise to a capital outflow. Periodic realignments become problematic, since currency traders will seek to anticipate the

government's actions; the merest hint that the authorities are contemplating a realignment may therefore prompt a speculative attack. In the absence of capital controls, defending the currency against attack requires a more dramatic hike in interest rates, which domestic policy makers and their constituents may not regard as worth the candle. And the knowledge that policy makers are weighing the reputational benefits of defending the currency against the costs of higher interest rates creates scope for self-fulfilling speculative attacks on what inevitably become increasingly fragile currency pegs.<sup>21</sup>

The implication is that countries are increasingly forced to choose between rigidly fixed currency pegs on the one hand a greater exchange rate flexibility on the other. This proposition, while controversial when first advanced, is now widely accepted.<sup>22</sup> It is buttressed by the steady

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<sup>21</sup>In traditional first-generation currency-crisis models, speculative attacks occur in response to ongoing balance-of-payments deficits and merely anticipate the devaluation and exhaustion of reserves that would have in any case occurred in their absence. In second-generation models of self-fulfilling crises, the speculative can precipitate a devaluation that would not have occurred anyway. Consider a government which is tempted to indulge in a more accommodating, more inflationary monetary policy in the hope of stimulating economic growth, but which concludes in its wisdom that the costs of continued monetary austerity, in the form of gloomier prospects for the banking system and employment growth, are dominated by the benefits of the greater credibility of its reputation for pursuing policies of price stability, which hinges in turn on its continued defense of the currency peg. Absent any change in market conditions, the government will maintain its currency peg indefinitely. Imagine now a speculative attack in which investors sell the currency for foreign exchange, draining liquidity from the market and forcing the authorities to raise interest rates. Suddenly the costs of defending the peg, in the form of additional unemployment and even more damage to the banking system, have risen relative to the benefits. The balance having shifted, it may now make sense for the authorities to abandon their defense of the currency in favor of more accommodating policies where doing so made no sense before. In this setting, a speculative attack can precipitate the collapse of the currency peg (it can succeed, in other words even if that peg could have been maintained indefinitely in its absence). The attack is self-validating because it can induce a shift in policy in a more accommodating, inflationary direction.

<sup>22</sup>The early statements were Crockett (1994) and Eichengreen (1994).

growth in the share of IMF member countries operating some form of variable exchange rates, by the repeated widening of fluctuation bands by countries still operating some sort of band- or target-zone arrangement and, at the other end of the spectrum, by growth in the number of countries operating currency boards and by European monetary unification.

The implication for Mercosur is that it is not worthwhile to discuss some kind of common basket peg or internationally-harmonized exchange-rate band as a durable basis for exchange rate stabilization.<sup>23</sup> What was possible in Europe in the 1980s, a European Monetary System of multilateral exchange rate pegs with periodic realignments, was possible then only because of the widespread maintenance of capital controls. What was possible in Europe in the 1990s, a European Monetary System of somewhat wider bands, was possible only because a credible commitment to move to monetary union in short order anchored expectations. No EMS-style arrangement will be viable elsewhere in today's world of high capital mobility.

Thus leaves three approaches to achieving greater exchange rate stability. One is the Voltairean regime: each country should tend its own financial garden. Some Mercosur members may prefer a currency-board arrangement under which they peg to a low-inflation country elsewhere in the world. Others may prefer policies of inflation targeting in which they target their own inflation rate. They should then cross their fingers and hold their breath that the intra-Mercosur exchange rates produced by this arrangement prove relatively stable.<sup>24</sup> There exist

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<sup>23</sup>It is perhaps revealing that the kind of arrangement proposed by the Brazilian authorities in 1993, namely that when Mercosur came into existence it should be accompanied by a system of exchange rate bands surrounding central parity values, is no longer on the table.

<sup>24</sup>This is the approach favored, on grounds of realism, by Bevilaqua and Abreu (1995). Alternatively, the countries involved might wish to exchange information and adjust domestic policies more actively. To this end, Lavagna and Giambiagi (1998) suggest the creation of



theoretical analyses of how the simultaneous pursuit of credible inflation-targeting regimes by a number of countries should in principle deliver relatively stable exchange rates between their respective currencies but as yet little actual historical experience against which these hypotheses can be tested.<sup>25</sup> Casual empiricism suggests that the exchange rates between countries operating inflation-targeting regimes can in fact vary quite widely. (Think, for example, of the recent experience of the UK and Sweden.) Inevitably, it is uncertain whether the degree of exchange-rate stability that might be obtained in this way would be consistent with political support for regional integration. To repeat, that will depend on how deep that integration is designed to go.<sup>26</sup>

The second approach is the “Cavallo regime” -- a generalized move to currency boards with all currencies pegged to the same external numeraire. Without meaning to cast aspersions on Argentina’s successful experience with a currency board, I am on record as arguing that this option is likely to appeal to countries only under the most exceptional circumstances. Pegging each of the Mercosur currencies to a common external numeraire like the U.S. dollar is an extremely indirect way of solving the problem of intra-Mercosur exchange-rate variability. It forecloses not just intra-Mercosur exchange-rate changes as an instrument of adjustment but also, in effect, changes in the exchange rate vis-a-vis the rest of the world. This is such a byzantine

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committees on fiscal affairs and on macroeconomic coordination (composed of finance and treasury ministers) to negotiate mutually acceptable macroeconomic goals and provide mutual surveillance of national policies.

<sup>25</sup>See Svensson (1994, 1998).

<sup>26</sup> Institutionalized consultations among the countries involved will facilitate the exchange of information and reduce the scope for misunderstanding and confusion, but they cannot support a durable exchange-rate stabilization agreement in today’s world of high capital mobility.

solution to Mercosur's exchange-rate problem that we can safely ignore it.

## 6. The Monetary-Union Option

The operative alternative to more freely floating exchange rates is a single currency for the customs union, the "Delors regime." This is a logically consistent option, monetary union being at the other end of the spectrum connecting fixed and freely floating exchange rates. It is a more politically palatable alternative than a set of separate currency boards, since it preserves exchange-rate flexibility vis-a-vis the rest of the world and entails only a partial sacrifice of monetary autonomy.<sup>27</sup> Even the ardent proponents of this option do not envisage monetary union tomorrow; rather, they see this as something the Mercosur countries can achieve in 15 years.<sup>28</sup>

The empirical analysis above suggests that Brazil and Argentina, if not also Paraguay and Uruguay, fit more easily at the Voltairean than the Delorean end of the monetary spectrum. Their actual exchange-rate variability may be higher than predicted, but even predicted levels are higher than those for most European countries, given observed levels of bilateral trade, export composition, and business cycle synchronization. But while these characteristics of countries are reasonably taken as fixed in the short run, over a longer time span like 15 years, they are likely to

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<sup>27</sup>Since monetary autonomy is merely shared among the participants in the monetary union rather than sacrificed entirely. The desirability of appending a monetary-integration initiative to Mercosur is not a mere hypothetical: it was alluded to in Protocol No. 20 on Economic Studies associated with the Treaty of Asuncion, signed by Argentina and Brazil in 1987, which declared "the need to initiate steps for the creation of...[a] common monetary unit." See Lavagna and Giambiagi (1998).

<sup>28</sup>See for example Giambiagi (1997).

change precisely in response to the choice of exchange rate regime.<sup>29</sup> This is a way of saying that the option of monetary union cannot be ruled out as infeasible a priori.

As noted above, some observers may be extolling monetary union for reasons having nothing to do with the customs union. Some in Argentina may view it as an elegant way of existing from the Convertibility Plan. A shift to a common currency which invoked the need to maintain solidarity within the customs union would not be seen as a simple abandonment of monetary propriety. By substituting one external monetary constraint for another, it would not be viewed as a return to irresponsible monetary policies. Some in Brazil see a common currency as Brazil's only respite from a world in which pegged exchange rates will be devalued sooner or later and all devaluations are disorderly. With a regional currency in place, Brazil will feel more comfortable about floating vis-a-vis the rest of the world. With the multi-national composition of the central bank board posing a constraint on its monetary policy freedom, it will feel more comfortable about giving up the exchange rate as a nominal anchor. For all these reasons, the fear of disorderly devaluations will be recede. And as interest rates decline to Argentine levels, the budget-deficit problem will evaporate.<sup>30</sup>

As the European debate has underscored, however, the existence of a smoothly functioning monetary union cannot simply be assumed. It cannot be conjured out of thin air. The Maastricht Treaty's preconditions for monetary union — its so-called convergence criteria — have probably created more confusion than insight into this issue. That said, European

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<sup>29</sup>Again, this is the point made so convincingly by Frankel and Rose (1996).

<sup>30</sup>Thus, Edwards (1998) estimates that if Brazilian interest rates decline to Argentine levels, the public-sector deficit will fall from 7 per cent to 3.2 per cent of GDP.

economists are now in broad agreement about the prerequisites for a smoothly functioning monetary union. These are four.

- *An independent central bank insulated from the political business cycle.* Monetary policy that is not delegated to independent central bankers who attach priority to price stability may exhibit an inflationary bias, reflecting time-inconsistency problems, or instability, reflecting pressure to respond to the electoral cycle. Hence, the Maastricht Treaty not only entailed the creation of an independent European Central Bank at the inauguration of the monetary union but required countries to buttress the independence of their national central banks during the lead-up as a way of demonstrating that the polity was prepared to live with the consequences of an independent central bank.

- *Wage and price flexibility.* This, it is now acknowledged, was the major omission of the Maastricht Treaty, which is preoccupied by “nominal” as opposed to “real convergence.”<sup>31</sup> Once the exchange rate is removed as a mechanism for internal relative price adjustment, other variables must take up the slack. The obvious candidates are greater domestic wage and price flexibility -- wage flexibility in particular. Unfortunately, evaluating it is problematic. Probably the best way to measure it is indirectly, namely, via the unemployment rate. If a country’s unemployment rate (properly measured) remains low in the face of disturbances, there is no reason why inadequate wage and price flexibility in response to shocks should elicit irresistible

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<sup>31</sup>See for example DeGrauwe (1997).

populist lobbying for a more inflationary monetary policy.

• *A strengthened financial sector.* The Maastricht Treaty addressed this problem indirectly, constructing debt and deficit ceilings under which qualifying countries had to squeeze, and an Excessive Deficit Procedure (with allied provisions) to limit deficit spending after the inauguration of the monetary union.<sup>32</sup> The justification for such restraints is as protection for the central bank from pressure to extend an inflationary debt bailout. If a government experiences a debt run and its banking system and financial markets, or those of neighboring countries, experience negative repercussions, the central bank may feel compelled to buy up the bonds of the government in distress, with inflationary consequences monetary-union wide. Moreover, the knowledge that some of those inflationary consequences will be borne by the partner countries will create moral hazard for each set of national fiscal authorities. This problem is not properly solved, however, by making some arbitrary debt or deficit ceiling the entry condition for monetary union or by placing the participating countries in a fiscal strait jacket and immobilizing their automatic stabilizers. The appropriate response is (i) to reform the institutions and procedures by which fiscal policy is made so as to eliminate any bias toward excessive deficits; and (ii) to strengthen banks and other financial institutions so that they are better able to withstand problems and hence are less likely to come for help to the common central bank.<sup>33</sup>

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<sup>32</sup>In addition, it included various loopholes and exceptions that greatly complicated interpretation and application of these criteria. This, clearly, is not something that the aspiring architects of any other monetary union would be advised to repeat.

<sup>33</sup>This is the critique of the Excessive Deficit Procedure and the Stability Pact in Eichengreen and Wyplosz (1998).

•*Barriers to Exit.* A monetary union is no guarantee of exchange rate stability if the participating countries can leave on a whim. Exit is the alternative to voice.<sup>34</sup> A country which is dissatisfied with the common monetary policy either because it is too inflationary or because it is not inflationary enough may be tempted to resurrect its own national currency and its own national monetary policy. This is easy technically; doing so requires only restarting the monetary printing press.<sup>35</sup> And if the markets begin to doubt governments' allegiance, they can force the issue, destabilizing the single currency.<sup>36</sup> In the European case, however, monetary union is one of an interlocking web of economic and political agreements, all of which could be jeopardized if

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<sup>34</sup>Where voice in the present instance means lobbying for a different common monetary policy.

<sup>35</sup>And there are enough examples of monetary unions that have dissolved — that of the Austro-Hungarian Empire, that of the Soviet Union, that of the now former Czechoslovakia — that we can dismiss the technical obstacles with confidence.

<sup>36</sup>Imagine that Germany is contemplating leaving Stage IIIA of EMU out of dissatisfaction with inflationary policies followed by the ECB in response to problems in the French financial system. (Sticking with the EMU example helps for focusing thought.) Imagine further that investors expect all deutsche marks still circulating in the monetary union to become liabilities of a newly reconstituted Bundesbank and that the deutsche mark will appreciate against the EMU currencies once Germany exits. Investors then have an incentive to hold deutsche marks rather than, say, French francs. Normally, as investors sell francs for marks, the ECB will instruct the Bundesbank, its German operating arm, to sell marks for francs at par. The Bundesbank would then request settlement in euros, which the Banque de France would provide in the form of the corresponding number of francs. The Banque de France's balance sheet would shrink, while the Bundesbank's would expand. So long as both countries remain committed to participation in the monetary union, nothing can disrupt this process. But if Germany is contemplating whether to leave the monetary union, the Bundesbank might be reluctant to accept franc-denominated assets on which it stands to suffer a capital loss. If it hesitates to exchange francs for marks at par, a premium on the latter could arise. That premium could convince the markets that breakup is imminent, accelerating the movement into marks. This would increase the difficulties of the French financial system, heighten the pressure for the ECB to inflate, and reinforce Germany's incentive to exit.

a country abandoned the single currency. This is a significant barrier to exit, which in turn serves to reassure and stabilize the markets.

Note that I have not discussed a number of conditions that featured in the Maastricht Treaty or in the debate surrounding it, on the grounds that subsequent analysis has come to see these as largely irrelevant. Thus, I do not think that the aspiring architects of other monetary unions should make the convergence of interest rates to low levels a condition for entry. The level of interest rates is an endogenous variable that responds quickly to politicians' statements and intentions regarding the composition of the monetary union; witness the rapid decline of Italian and Iberian interest rates as it became clear that European officials had a political preference for a wide monetary union. I do not think that candidate countries should be required to peg their exchange rates for a certain number of years. Not only is the value of the exchange rate another notoriously endogenous variable, but attempting to peg it in a world of high capital mobility (short of adopting a currency board) is a recklessly dangerous strategy.<sup>37</sup> I do not think that bringing inflation down to specified levels is an essential criterion, because there is no necessary reason to believe that a temporary reduction in inflation will be permanent. The more appropriate way of addressing inflationary fears is by reforming the institutions by which monetary policy is made so as to remove any inflationary bias — that is, by making the central bank independent. I do not think that measures to promote immigration or fiscal transfers within the monetary union are essential for its smooth operation. It is unfortunate that the debate over

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<sup>37</sup>This was Europe's own experience: a series of speculative attacks in 1992-3 forced officials to widen the fluctuation bands for their currencies from 4 ½ per cent to 30 per cent,

Maastricht was diverted from the importance of wage and price flexibility and into discussions of the need for labor mobility among the participating countries and some form of intra-union fiscal transfers. Immigration and fiscal federalism are less direct, more politically-demanding substitutes for wage and price flexibility. Neither is needed if domestic labor and product market flexibility is enhanced. The key, everyone agrees, is wage flexibility, which is essential to a smoothly-functioning monetary union.<sup>38</sup>

How far are the Mercosur countries from satisfying the four key preconditions for a smoothly functioning monetary union? They have already gone a long way down the road to the creation of politically and economically independent central banks. The sticking points are to strengthen financial systems and enhance labor market flexibility. Both items are already on the reform agenda. Argentina has taken significant steps to strengthen its banking system, raising capital standards and tightening regulation, while Brazil has identified the need to impose hard budget constraints and modern management practices on its state banks. Much more clearly needs to be done, however, before the four Mercosur countries can declare themselves ready for prime time.

Reducing the strains on the financial system also requires eliminating existing biases toward bloated public sectors, excessive deficits, and heavy reliance on short-term debts. Again, some of the requisite reforms are in train, such as administrative reform in Brazil that would allow the government to reduce the size of the bureaucracy. But readiness for monetary union

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rendering the exchange-rate criterion largely irrelevant.

<sup>38</sup>Thus, the approach recommended here is rather different from that of Lavagna and Giambiagi (1998), whose suggest that governments should target inflation rates, budget deficits, and current account deficits.



requires more far-reaching reforms to centralize the budgetary process, vesting more agenda-setting and expenditure-veto powers in the hands of the president or finance minister as a way of diminishing common-pool problems.<sup>39</sup>

Labor market flexibility is not a traditional South American strength, to put an understated gloss on the point.<sup>40</sup> Brazilian and Argentina unemployment together have scaled Western European levels, reaching the double digits.<sup>41</sup> A smoothly functioning monetary union will need a more flexible labor market, as manifested in a lower unemployment rate. Many of the relevant reforms have been proposed but are yet to be implemented. Brazil's August 1998 measures are a step forward, especially those relaxing obstacles to part-time employment, reducing the costs of temporary layoffs (and therefore hiring and firing costs), and giving employers more flexibility in compensating workers for overtime. But this is only a first modest step toward the creation of a more flexible labor market: abolishing compulsory contributions to unions, allowing workers to join the union of the choice, increasing the incentives for youth training, and rationalizing laws regarding retirement have all been proposed but not implemented. Efforts to rationalize civil service employment have been similarly watered down.

The labor-market situation in Argentina is similarly no better than mixed in terms of the preconditions for monetary union. Labor legislation has been changed as a condition of IMF

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<sup>39</sup>See Eichengreen, Hausmann and von Hagen (1996).

<sup>40</sup>Camargo (1997) emphasizes the Brazilian labour market's high turnover and wide wage dispersion as evidence of flexibility, but admits to other rigidities, and was in casing writing before the current period of high unemployment, which is suggestive of rising rigidity.

<sup>41</sup>Some would say that Europe's success in moving to monetary union in the face of double-digit unemployment rates indicates the irrelevance of this variable. But this would be to repeat European mistakes rather than to learn from European experience.

support, but the efficacy of those reforms is disputed. Collective bargaining remains highly centralized, encouraging wage compression and limiting flexibility, although it is now possible for negotiations to proceed on a company by company basis if (and only if) agreed to by the union. Provisions in the old law automatically renewing the terms of an existing contract if a new one is not agreed to were not abolished as recommended by the Fund. While temporary contracts introduced in 1995 have reduced hiring and firing costs and reduced non-wage costs for some employers (resulting in an estimated decline of 10 per cent in average labor costs), these “trash contracts” are strongly opposed by Argentina’s union federation, the CGT, and their future is uncertain.

Revealingly, while Argentine unemployment has been reduced from the more than 20 per cent it reached in the wake of the Tequila crisis, it remains well into the double digits (13 per cent at time of writing), which is hardly evidence of sufficient labor market flexibility. Some would say that if Argentina can successfully reconcile double-digit unemployment with a currency board, it can equally well reconcile double-digit unemployment with a monetary union. The problem is that there may be greater opportunity for unions concerned with high unemployment press for a more inflationary monetary policy once monetary autonomy is restored, in this scenario by being placed in the hands of a Mercosur central bank.

Finally, there is the creation of barriers to exit, which are essential for a smoothly-functioning monetary union. In Europe, these are provided by the three pillars of the integration process: a common economic policy, a common social policy, and a common security policy. The European Union has embarked on a wide variety of integration initiatives, which extend from the Single Market to the creation of a European army and a European foreign policy.

Admittedly, these extensive commitments do not prevent European governments dissatisfied with various aspects of the European project from discussing exit as a hypothetical option from time to time, as readers of the English and Danish press will be aware. But the fact that this entire network of interlocking bargains could be jeopardized by a country's decision to abandon one of them, namely monetary union, is a formidable barrier to exit.

This is simply another way of arguing that monetary union makes sense as a solution to Mercosur's exchange rate problem only if it is part of a significantly deeper integration project. If Mercosur ends with a customs union, then it will be hard to create the exit barriers necessary for that monetary union to operate smoothly. And, if integration stops at the border, there is no reason why some exchange rate variability should be a dire threat to political support for that customs union. If, on the other hand, there develops a readiness to transform Mercosur into a more far-reaching integration initiative, involving the creation of a true single, integrated South American market, then exchange rate swings will become more politically disruptive, and monetary unification becomes not only feasible but essential.

## Appendix

### **Results for Nominal Exchange Rate Variability**

Table A.1	Optimum Currency Area Regressions for Nominal Exchange Rate Variability
Table A.2	Optimum Currency Area Regressions for Nominal Exchange Rate Variability, Recent Subperiod
Table A.3	Optimum Currency Area Regressions for Nominal Exchange Rate Variability, 1990s Only
Figure A.1	Scatter Plot of Fitted Values Against Actual Values for Nominal Exchange Rate Variability
Figure A.2	Scatter Plot of Fitted Values Against Actual Values for Nominal Exchange Rate Variability, Continued

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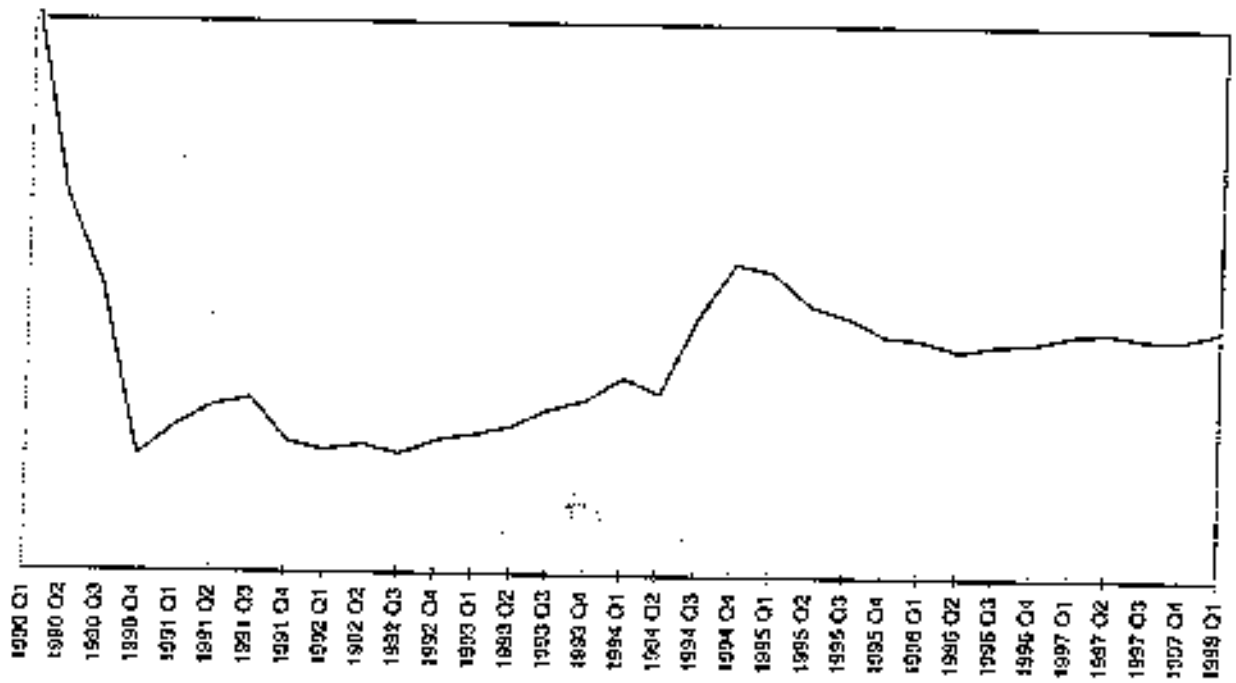
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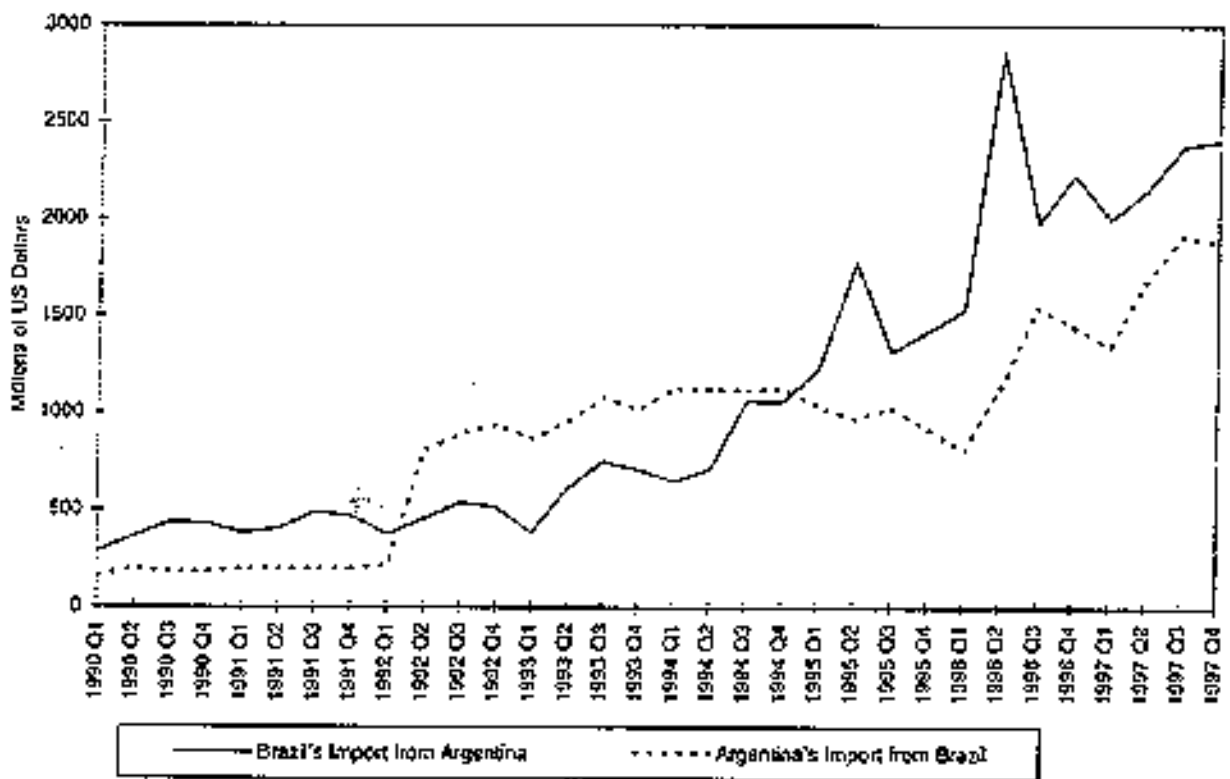
**Figure 1**  
**Argentina-Brazil Real Exchange Rate \***



\* Pesos per Real nominal exchange rate over the ratio: price index in Brazil over price index in Argentina.  
 Source: International Financial Statistics, IMF.



Figure 2  
Argentina-Brazil Trade

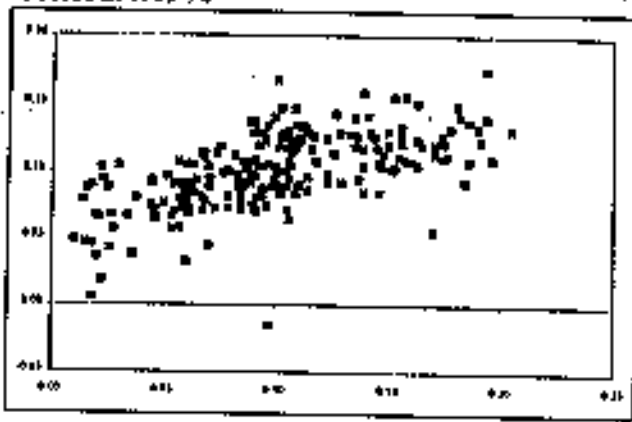


Source: Direction of Trade Statistics Quarterly, IMF.

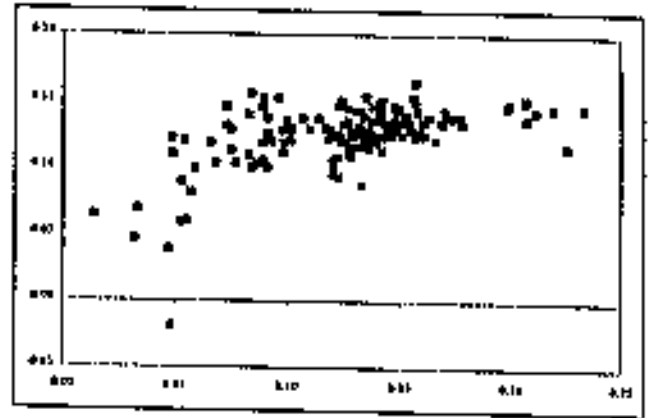
Figure 3

Scatter Plot of Fitted Values Against Actual Values of Real Exchange Rate Variability

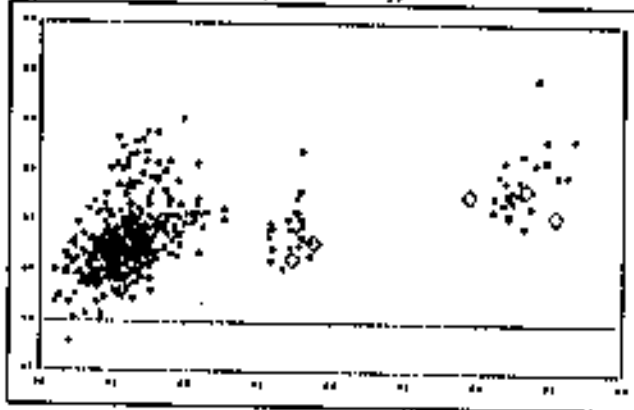
EUROPE: 1983-92



JAPAN: 1976-95



MERCOSUR: 1973-82 (Without dummy)



MERCOSUR: 1973-82 (With dummy)

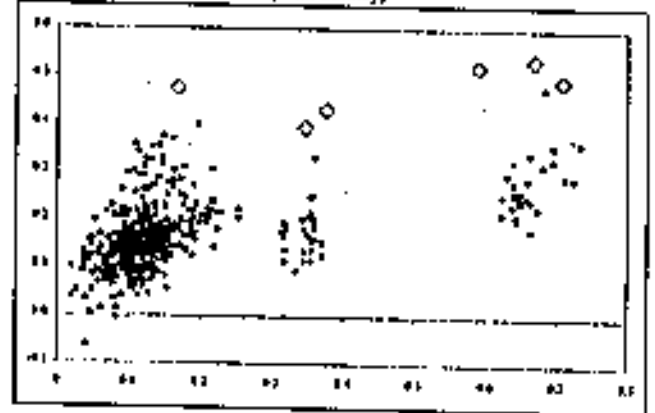
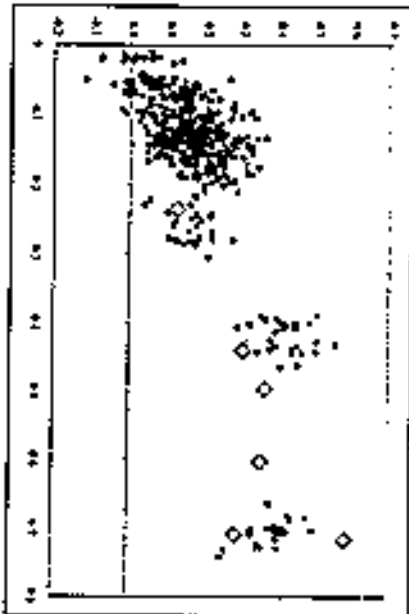


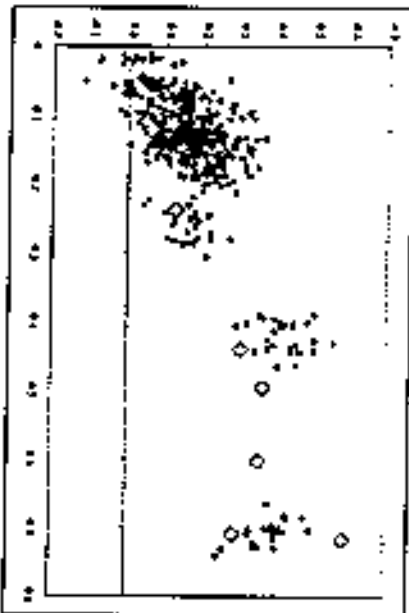
Figure 4

Scatter Plot of Fitted Values Against Actual Values of Rent Exchange Rate Variability

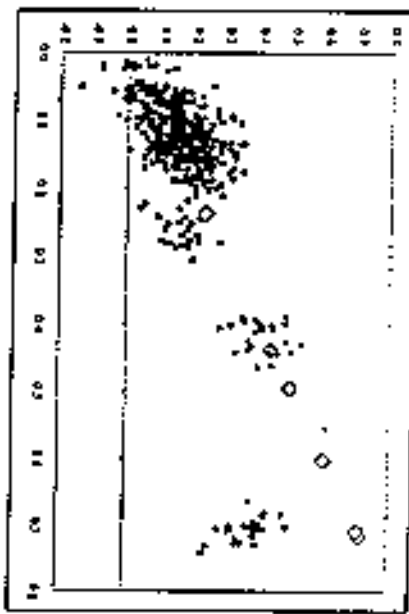
MERCOSUR: 1983-86 (without dummy)



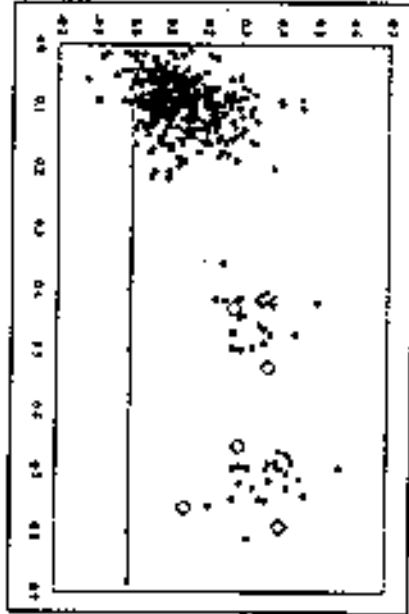
MERCOSUR: 1983-86 (with dummy)



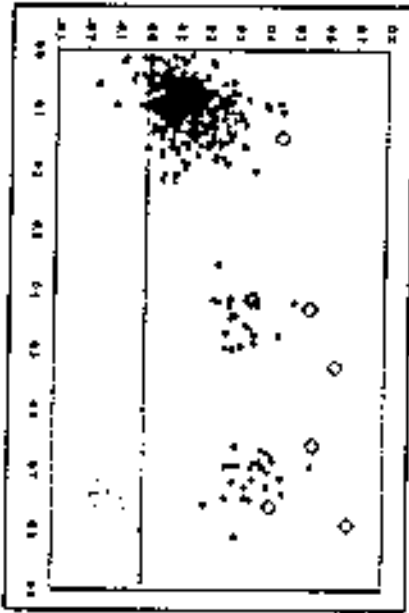
MERCOSUR: 1983-86 (with dummy and interaction term)



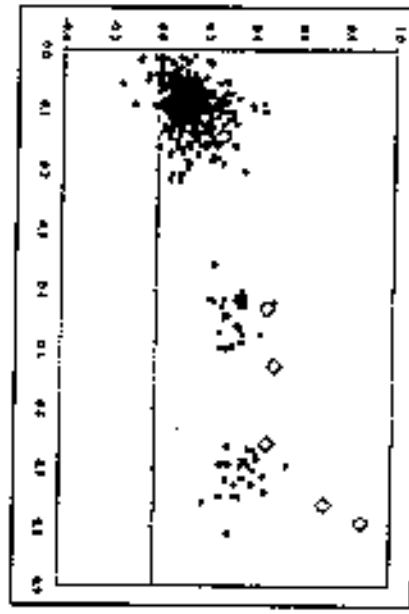
MERCOSUR: 1990-96 (without dummy)



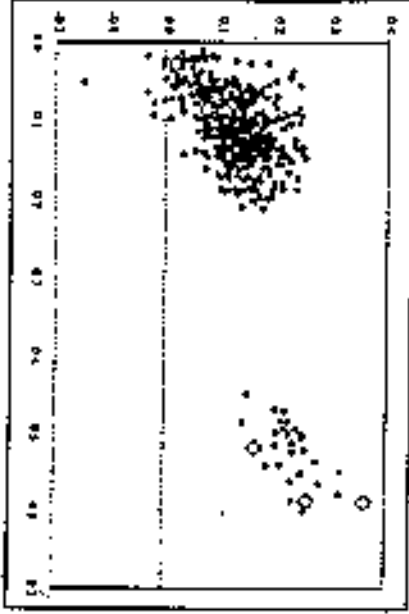
MERCOSUR: 1990-96 (with dummy)



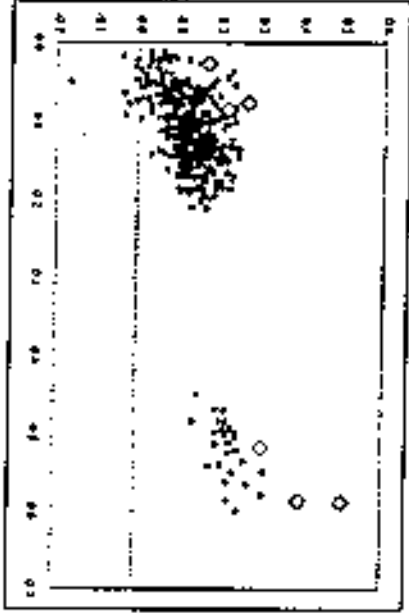
MERCOSUR: 1990-96 (with dummy and interaction term)



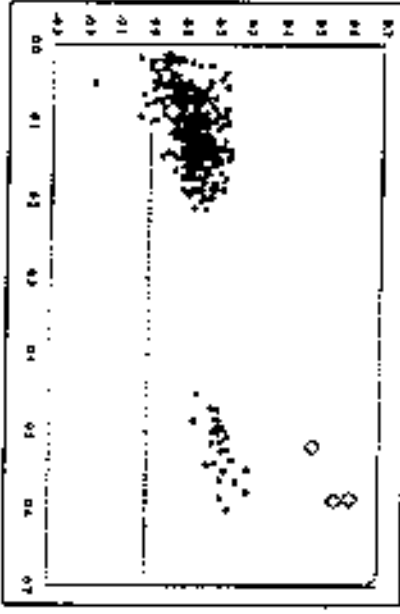
MIXTURE: 1983-96 (without dummy)



MIXTURE: 1983-96 (with dummy)



MIXTURE: 1983-96 (with dummy and interaction term)



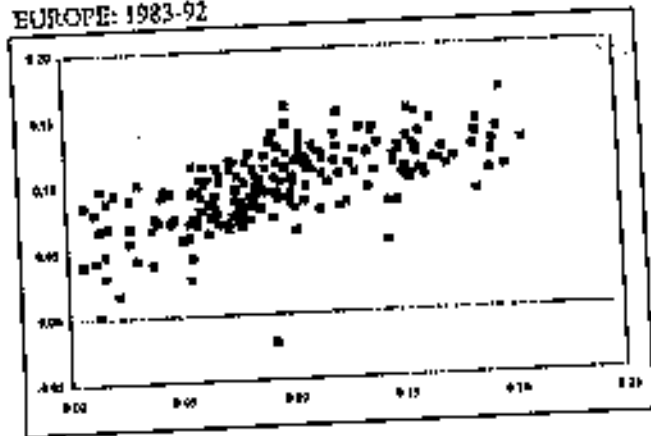
◊ MERCOSUR-Mercosur country pairs

■ Other pairs of countries

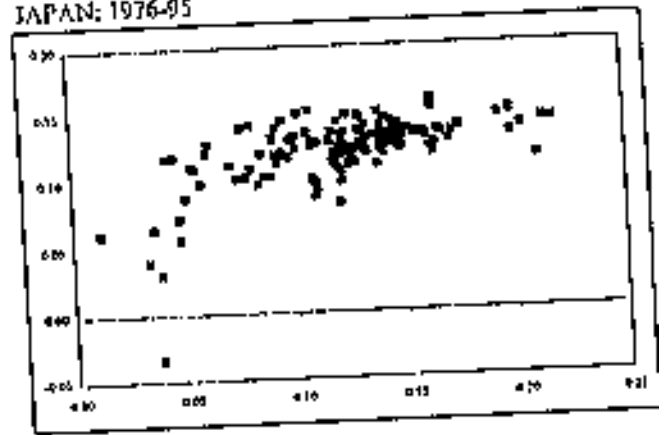
Figure A.1

Scatter Plot of Fitted Values Against Actual Values of Nominal Exchange Rate Variability

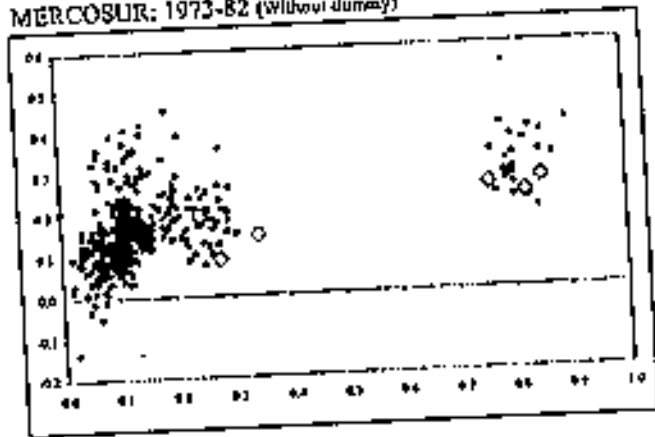
EUROPE: 1983-92



JAPAN: 1976-95



MERCOSUR: 1973-82 (without dummy)



MERCOSUR: 1973-82 (with dummy)

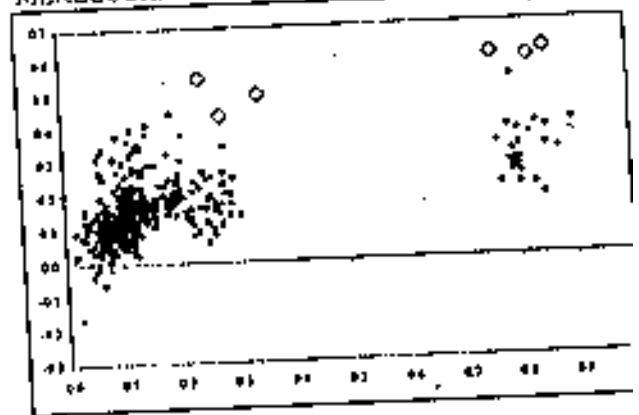
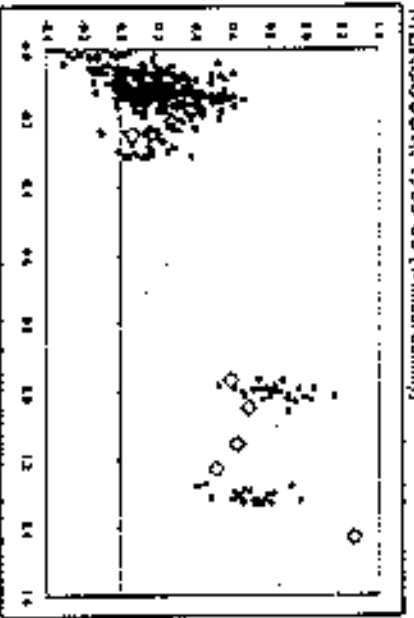


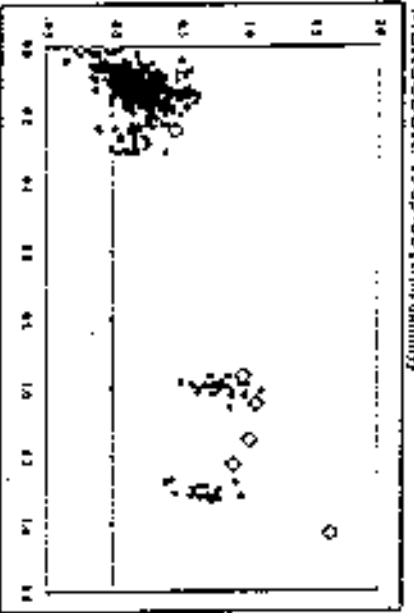
Figure A.2

Scatter Plot of Fitted Values Against Actual Values of Nominal Exchange Rate Variability contd.

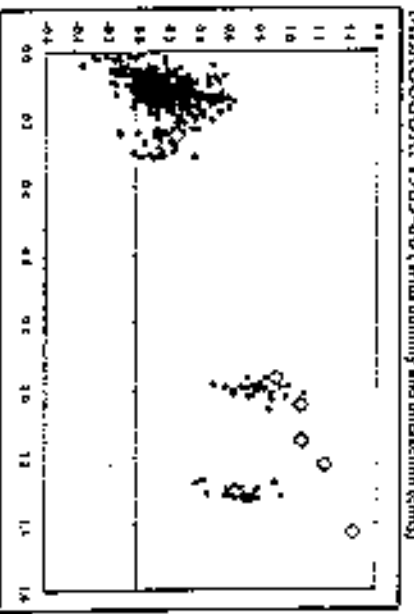
MERCOSUR: 1983-86 (without dummy)



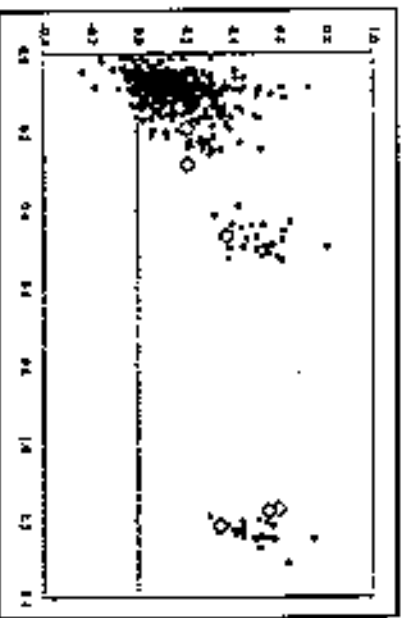
MERCOSUR: 1983-86 (with dummy)



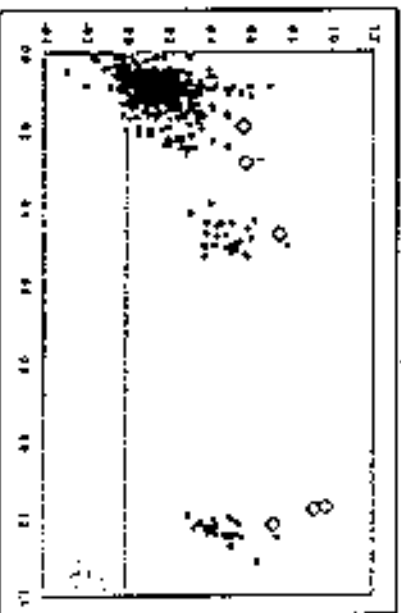
MERCOSUR: 1983-86 (with dummy and interaction term)



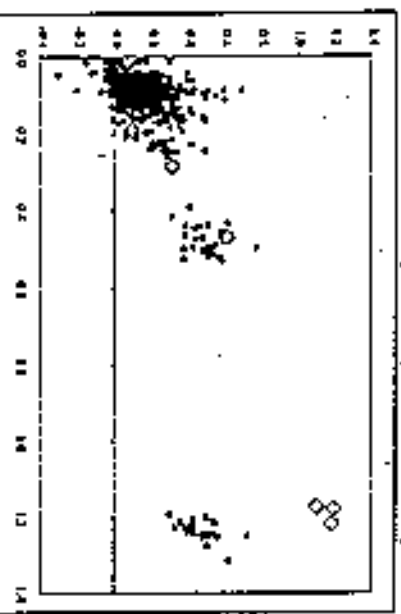
MERCOSUR: 1990-96 (without dummy)



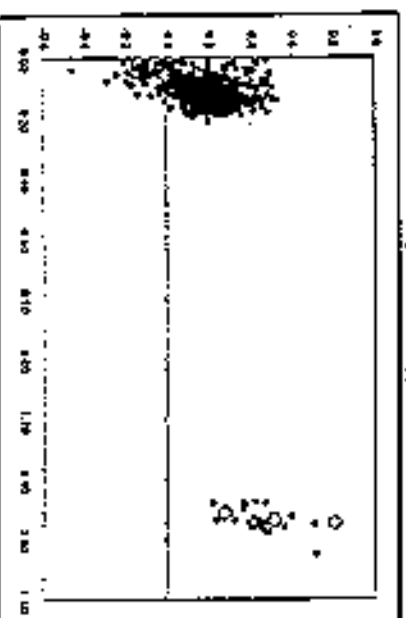
MERCOSUR: 1990-96 (with dummy)



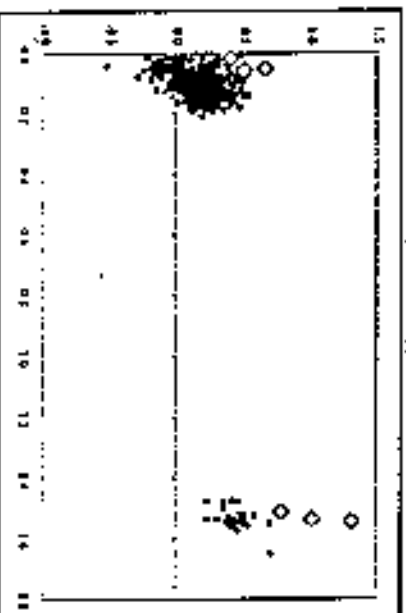
MERCOSUR: 1990-96 (with dummy and interaction term)



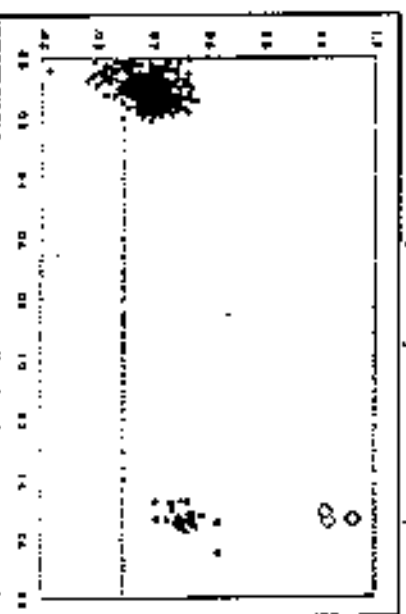
MIXTURE: 1983-96 (without dummy)



MIXTURE: 1983-96 (with dummy)



MIXTURE: 1983-96 (with dummy and interaction term)



○ Mercosur-Mercosur country pair

■ Other pairs of countries