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Economic integration without policy coordination: the case of Mercosur

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Abstract

This paper analyses the evolution of the South American Common Market, Mercosur. We show how the lack of coordination of macroeconomic policies, especially of the two major participants (Argentina and Brazil), had caused trade strains. Divergent macro-economic policies have had negative effects on bilateral trade due to the risk averseness (resulting from bilateral exchange rate volatilities) of exporters and importers, and due to the protectionist forces they have brought forth.

JEL classifications: F4; F42

Keywords: Exchange rate volatility; Trade; Protectionist policies

1. Introduction

The common market of Argentina, Brazil, Uruguay and Paraguay (Mercosur) was created in 1991 by the Asuncion Treaty. Trade within Mercosur increased substantially since that time. For instance, in the period 1990–1998 the share of intra-Mercosur exports rose from 9 to 25% of total Mercosur exports (Inter-

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American Development Bank, 1999, p. 25). This occurred while different stabilization programs were instituted in the region's largest economies, Argentina and Brazil. As the macroeconomic policies pursued to stabilize these two large economies were substantially different, they gradually threatened the existence of Mercosur.[1]

Excessive price and exchange rate fluctuations resulting from unco-ordinated macroeconomic policies affect international trade and the allocation of investments among members of a trade area. There are *two main channels* through which the lack of macroeconomic coordination affects international trade. First, there is an increased level of risk in international transactions (*risk channel*), which may induce producers to refrain from exporting or importing and therefore, causing an allocation of resources different than what would be suggested from comparative advantage. It also stimulates lobbying for protection from imports when there exists a substantial increase in the import penetration ratio (*lobbying channel*).

Thus, the expected expansion of regional trade, and even the formation of a common market,[2] may be hampered by the fact that the two main countries of Mercosur do not have their economic policies directed towards economic integration. The objective of this paper is to investigate whether un-coordinated macroeconomic policies of Brazil and Argentina can hamper the further expansion of trade flows in the region through the increase of risk involved in regional transactions and through the implementation of trade protection measures originating from the lobbying of interest groups.

Our work clearly relates to an earlier literature on Mercosur, in particular, to Bevilaqua (1997), Olarreaga and Soloaga (1998), Flôres et al. (2000). Bevilaqua emphasized the risk channel while neglecting the lobbying impact. The others concentrated mainly on the political economy aspect of protection (lobbying channel), while neglecting the results of the lack of macroeconomic coordination and the risk channel. Our contribution is to take all these variables into account in order to show the impact of the lack of macroeconomic coordination on bilateral trade between the two main economies of Mercosur.

The paper is presented in the following sequence. Section 2 describes the evolution of trade integration since the creation of Mercosur. It also describes how this period can be divided into sub-periods, depending on acute divergences of macroeconomic policies between Brazil and Argentina and presents some examples of trade strains between these two countries. Section 3 describes and tests how un-coordinated macroeconomic policies affect trade through risk and through the political economy of trade. In the latter case we focus on the description of what in

[1] The prioritization of stabilization programs instead of commercial integration may also produce a lack of tax harmonization between members of a trade area. The lack of tax harmonization may cause an excess flow of capital within and from outside the region to those countries with the lowest taxes. This is not necessarily the most efficient location, and it may also lead to confrontation among the members of the common market and result in controls over the free movement of capital within the region. See Brandão and Pereira (1997), Chapter 5.

[2] The formation of a common market was one of the targets of the Asuncion Treaty. See Averbug (1998, p. 3). Giambiagi (1999, p. 20), goes further and defend that Mercosur should move towards a monetary union in the long run.

the literature is called a trade barrier equation. The variables contained in a trade barrier equation are important in the definition of the level of protection in each sector of the economy. The equilibrium protection of each sector is defined by the demanders of protection, i.e. the lobbies, and by the suppliers of protection, the politicians. Section 4 presents our major conclusions and some policy implications.

2. Trade integration and lack of macroeconomic coordination

2.1. Trade integration

Mercosur (called Mercosul in Brazil) was created in 1991 by the Treaty of Asuncion. It established a program of gradual, automatic and across-the-board elimination of import duties between June 1991 and December 1994. Most tariffs were dismantled according to a set timetable, and since 1995 most intra-regional trade faced zero duties (Averbug, 1998, p. 4). A common external tariff (CET) structure was established in January 1995, ranging from zero to 20%. The CET applies to 85% of total trade and lists of temporary exemptions affect 300 items in each country.[3]

Neither the free trade area nor the CET was fully implemented by the turn of the century. Some sensitive goods were excluded from the free trade area, and capital goods, computers and related software and telecommunications equipment were not yet included in the CET regime.[4] Each Mercosur country can charge its own tariff rate on such goods. For capital goods, tariff rates were supposed to converge at 14% by January 2001 for Argentina and Brazil, and by January 2006 for Paraguay and Uruguay. In the case of computers and related software and telecommunications equipment, tariff rates are supposed to converge to 16% by 2006.

The automobile sector remains outside the sub-regional agreement. By the first half of 2000 Mercosur countries agreed to converge existing national tariffs on extra-regional imports with a common external tariff of 35%, effective from January 1 2006, while requirements of local contents for intra-regional tariff-free trade in the sector was set at 60% and fiscal incentives at the sub-national level were supposed to end (Inter-American Development Bank, 2000, p. 52).

Trade integration in Mercosur has undeniably increased since the Asuncion Treaty. Tables 1 and 2 show growth rates of import and export for the two main partners in Mercosur, Brazil and Argentina. Table 1 shows that in the 1990s Brazil's exports grew by on average 6%, but its exports to Mercosur grew by approximately 23% or almost three times more than its total exports. Brazil's total imports grew on

[3] Mercosur Report (various issues). In July of 2001, Argentina unilaterally reduced its extra-regional import tariffs for capital goods and computers equipment. The impacts and repercussions of this measure are still to be known. See 'Analistas dizem que conflito entre os dois países é passageiro,' in O Estado de São Paulo, 11th July 2001.

[4] Although each country should have eliminated all barriers to intra-trade in Mercosur by 1995, they were allowed to have a list of products considered 'vulnerable' to foreign competition, which would be protected until 1999 for Brazil and Argentina and 2001 for Uruguay and Paraguay. The Brazilian list included 29 products, the Argentinean 212, the Paraguayan 432 and the Uruguayan 963. See Averbug (1998, p. 4).

Table 1
Growth rate of Brazil's trade with Mercosur

	Total exports	Exports to Argentina	Exports to Mercosur	Total imports	Imports from Argentina	Imports from Mercosur
1991	0.7	128.8	74.9	1.8	15.4	−2.2
1992	13.2	105.9	77.4	−2.3	7.2	−1.8
1993	7.7	20.4	31.5	22.9	56.9	51.6
1994	12.9	13.0	9.9	31.0	34.8	35.7
1995	6.8	−2.3	3.9	50.5	52.7	49.3
1996	2.7	27.9	18.7	7.1	21.7	21.3
1997	11.0	31.0	23.8	12.0	18.0	14.6
1998	−3.5	−0.3	−1.9	−3.4	0.0	−0.9
1999	−6.1	−20.5	−23.7	−14.7	−27.7	−28.7
2000	14.7	16.2	14.1	13.3	17.7	16.0
Average	6.0	32.0	22.9	11.8	19.7	15.5

Source: Brazil—Ministerio do Desenvolvimento, Industria e Comercio.

average by approximately 12% in the 1990s while its imports from Mercosur countries grew by approximately 15%.

Table 2 shows the increasing importance to Argentina of trade with Mercosur members. While Argentina's exports grew on average by approximately 8% in the 1990s its exports to Mercosur grew by approximately 19%. In the same period Argentinean imports grew on average by approximately 25% while its imports from Mercosur's countries increased by approximately 30%.

Even with its many imperfections, the Mercosur led to a sharp reduction in external protection. The average tariff for the trade block declined from 41% in 1986 to 12% in the late 1990s. In the same period there was a substantial expansion

Table 2
Growth rate of Argentina's trade with Mercosur

	Total exports	Exports to Brazil	Exports to Mercosur	Total imports	Imports from Brazil	Imports from Mercosur
1991	−2.4	7.1	11.1	105.4	114.3	112.5
1992	3.3	13.3	10.0	81.5	120.0	111.8
1993	7.0	64.1	66.4	13.3	12.1	13.9
1994	20.8	31.2	31.1	29.0	15.9	16.6
1995	32.1	50.5	41.5	−6.7	−2.8	−4.0
1996	13.6	20.1	16.6	18.5	27.8	26.4
1997	9.9	22.5	20.7	28.1	29.5	30.9
1998	0.0	−2.3	−1.8	3.5	2.2	4.5
1999	−11.8	−28.2	−24.7	−18.5	−20.6	−16.8
2000	12.7	23.6	18.7	−1.4	15.7	9.1
Average	8.5	20.2	19.0	25.3	31.4	30.5

Source: INDEC.

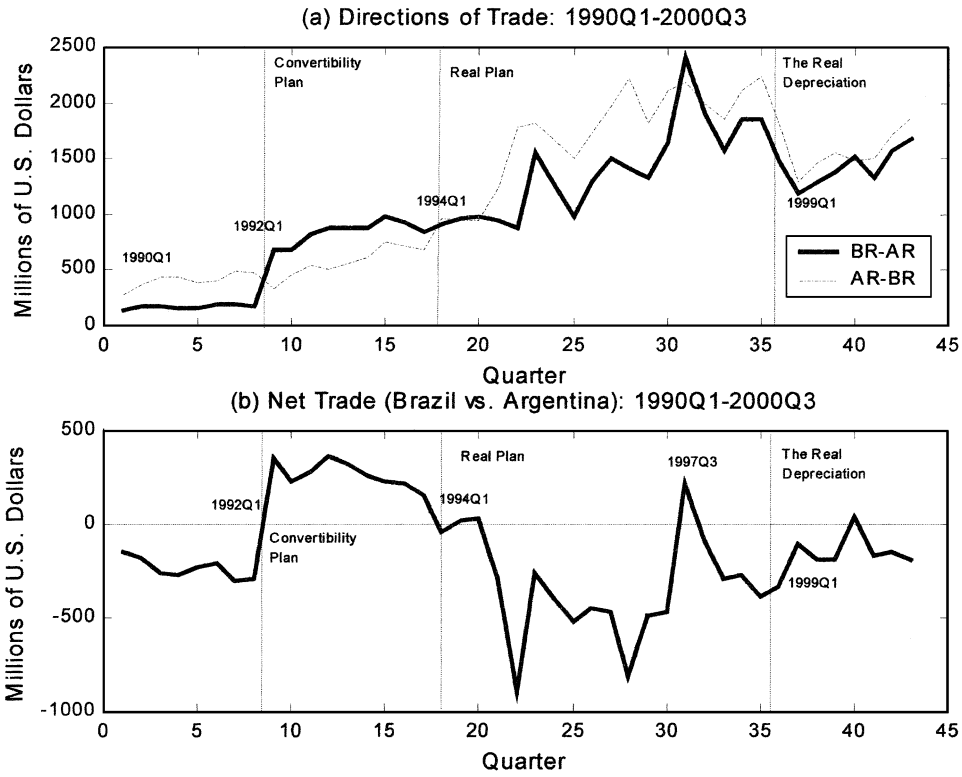

Fig. 1. Bilateral trade (Brazil and Argentina): 1990Q1–2000Q3.

of trade within the region. Between 1990 and 1997, intra-Mercosur exports grew by an average of 26% per year, rising from US$4 billion to 21 billion. The share of intra-regional trade in Mercosur's total exports rose from 9% in 1990 to 25% in 1998. This implied a substantial growth in regional trade interdependence. Thus, Brazil accounted for one third of Argentina's exports by the end of the 1990s, 40% of Paraguay's exports and 35% of Uruguay's exports. In the automotive sector, Brazil accounted for 90% of Argentina's exports in 1997.

2.2. Divergent macroeconomic policies

Although Mercosur has successfully increased trade among its members, part of the trade flows within Mercosur were achieved by the economic policies of Brazil and Argentina, which were not primarily directed to trade integration but rather to macroeconomic stability. The period from the creation of Mercosur to the early 2000s can be divided into three phases, each of them related to different macroeconomic regimes in the two main Mercosur members (the introduction of Argentina's Convertibility Plan in 1991, of Brazil's Real Plan in 1994 and the devaluation of

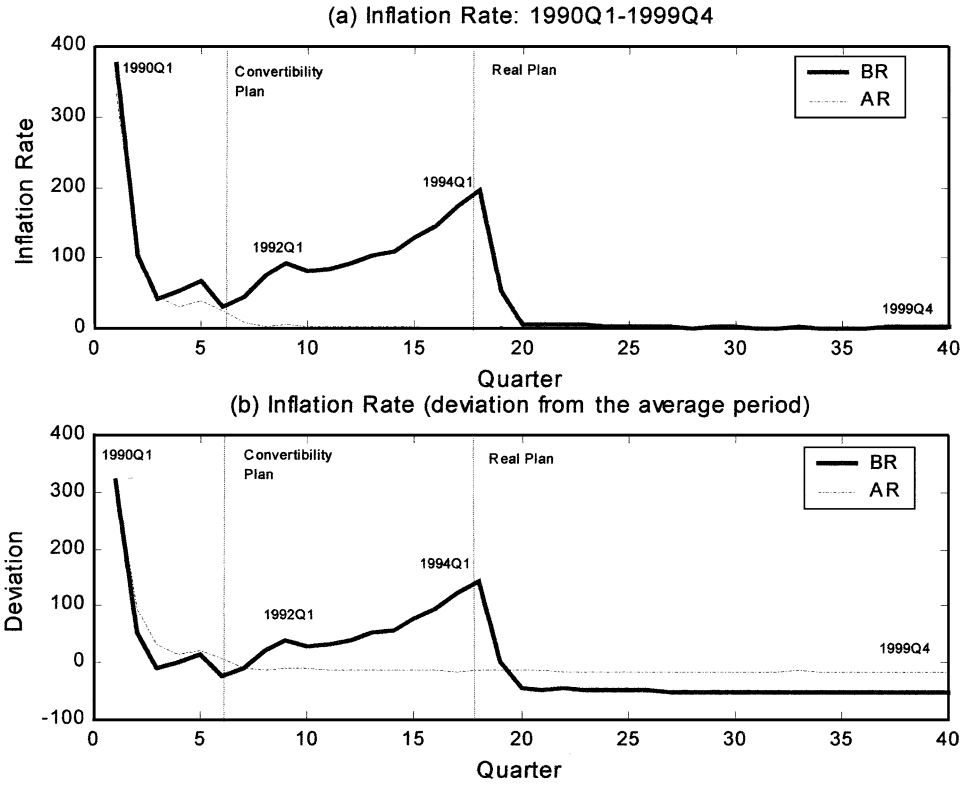

Fig. 2. Inflation rate (Brazil and Argentina): 1990Q1–1999Q4.

the Real in January 1999). Fig. 1a illustrates how each regime affected trade between Argentina and Brazil. One notes a positive trend in bilateral exports, though this declined in 1998 and 1999. Fig. 1b shows the behavior of the net trade (deficit/surplus) of Brazil with respect to Argentina during the three phases. As discussed below, this series is consistent with the exchange rate and macroeconomic policies adopted in each country.

The first period extends from the implementation of the Convertibility Plan in Argentina in 1991 to the implementation of the Real Plan in Brazil in 1994. With the implementation of the Convertibility plan, the Argentinean Peso was fixed by law at par with the US dollar and the Argentinean central bank could only issue new currency if backed by US dollars. Although the Convertibility plan caused a sharp reduction in the inflation rate (Fig. 2), prices in Argentina continued to rise at a higher rate than in the US, which caused an appreciation of Argentinean Peso vis-à-vis the US dollar (Fig. 3).

At the same time, Brazil continued to live under a high inflationary regime (Fig. 2), but with constant devaluations vis-à-vis the US dollar, hence, also vis-à-vis the Argentinean Peso (Fig. 3). The real appreciation of the peso vis-à-vis the Brazilian

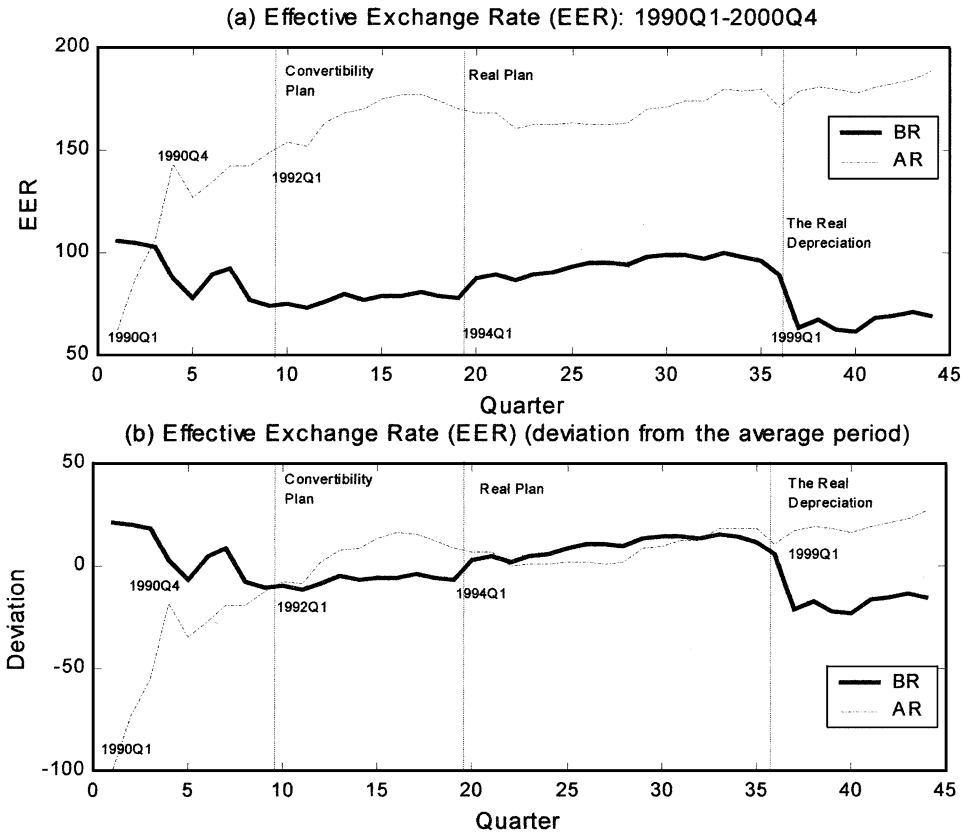

Fig. 3. Effective exchange rate (Brazil and Argentina): 1990Q1–2000Q4.

currency and the growth boom in Argentina due to the end of inflation, resulted in a change in the trade balance of Argentina with Brazil, from a surplus of US$853 million in 1990 to a deficit of US$1031 million in 1993 (see IMF, 1994).

As a consequence of the increasing trade deficit with Brazil, Argentina's government took a series of protectionist measures in 1992. It increased the 'statistical tax' levied on imports from 3% to 10%, including imports from Mercosur, and implemented safeguards and antidumping measures to protect its industry from foreign competition (see Valls Pereira, 1992, p. 99). Although this was viewed by Brazil as a move which was contrary to the goals of Mercosur, the ultimate reaction of Brazil was pragmatic. In order to help alleviate the bilateral deficit with Argentina, the Brazilian government decided to buy wheat and petroleum from Argentina in 1993 (see Bevilaqua, 1997, p. 14).

The second period ranges from the implementation of the Real Plan in Brazil in July of 1994 to the Brazilian external crisis of January of 1999. In the first semester of the implementation of the Real Plan (second half of 1994), the Brazilian currency

appreciated heavily vis-à-vis the US dollar, when one Real could buy more than one US dollar, and although the Brazilian inflation dropped sharply, it was still much higher than the US inflation rate.[5] Since the Argentinean Peso had a fixed parity with the dollar, the Real appreciated considerably relative to the peso (Fig. 3). As a consequence, the Brazilian trade balance with Argentina changed from a surplus of US$170 million in 1994 to a deficit of US$2250 million in 1996 (see IMF, 1997).

In response to the deterioration of its trade balance, Brazil took a series of protectionist measures. The tariff on vehicle imports[6] was increased, and quotas and restrictions on import credit were applied to selected products (including those produced in Mercosur) in 1995 (Padin and Gonzalez, 1997, p. 66). In 1997, Brazil imposed a system of discretional import licenses on selected products. The Mercosur Tribunal condemned the Brazilian system of discretional import licenses and ordered its suspension until the end of 1999. However, Brazil was allowed to postpone the removal of this protectionist measure until the end of 2000 (see Inter-American Development Bank, 2000, p. 49).

The third period ranges from the Brazilian external crisis of January of 1999 until mid-2001. In January of 1999 the Brazilian government had to give up its policy of periodic small devaluations of the Real vis-à-vis the US Dollar due to the accelerated loss of foreign reserves, resulting from a combination of capital outflows and trade deficits (Baer, 2001, Chapter 10). As a result the Real was allowed to undergo a drastic devaluation (of 40%) vis-à-vis the US dollar, and hence the Argentinean Peso (Fig. 3). As a consequence of the Real depreciation, the deficit in the trade balance of Brazil with Argentina decreased from US$1282 million in 1998 to US$448 million in 1999.[7]

The latest crisis in Argentina, in which GDP shrank by 0.5% in 2000 and is expected to stagnate in 2001, was 'another blow to Mercosur.'[8] Argentineans view that their economic recession has been worsened by Brazil's exchange floating system, in which the Real has lost over 40% of its value since its devaluation in 1999 (Fig. 2). Nevertheless, Argentina has regained part of its trade surplus with Brazil (Fig. 1). This was only possible through protective measures in which not only existing trade restrictions were maintained, but also new obstacles to free trade were created. For instance, Brazil and Argentina negotiated voluntary export restrictions on Brazilian shoe exports in order to contain the fast growth of Brazilian exports to Argentina in this sector.[9] Also, Argentina proposed a rise in Mercosur's

[5] For details of the Real Plan, see Baer (2001), Chapter 10.

[6] Brazil and Argentina have different regimes to protect and develop the auto industry and both regimes should converge to a free trade intra-Mercosur regime by 2006. See Inter-American Development Bank (2000, pp. 44–48).

[7] The Brazilian trade with Argentina reached a deficit of US$502 millions until the third semester of 2000. See IMF (2000).

[8] Latin America: Economy and Business, May 2001 (Latin American Newsletters).

[9] Other examples of new voluntary export restrictions are textiles and meat. A good example of quotes and minimum prices is steel products. See: Inter-American Development Bank (2000, pp. 36–49). Other sources are Valls Pereira (2000) and Baumann (2001, pp. 51–54).

tariff on consumer goods from 14% to 35% in order to contribute to the economic recovery.[10]

What are the effects of these un-coordinated policies on the trade integration in Mercosur (Argentina and Brazil)? The next section addresses this issue.

3. Divergent macroeconomic policies and trade in Mercosur

Unco-ordinated macroeconomic policies give rise to excessive price and exchange rate fluctuations which impact international trade through two different channels.[11] The first channel (direct effect) is through the impact on domestic producers' exports, due to an increase in the variability of the exchange rate. Exchange rate volatility affects risk and may lead risk-averse importers and exporters to reduce their demand and supply of traded goods. The second channel (indirect effect) is through the emergence of lobbies for protection of import competing sectors.

3.1. Exchange rate variability and trade flows in Mercosur

The effect of exchange rate variability on international trade has long been a major concern for policy-makers. This is also the case in Mercosur. To characterize Brazil's floating exchange rate system, Argentina's ex-economy minister, Domingo Cavallo, for instance, posited that '*those who devalue their currency are stealing their neighbors' house*.'[12] This is an important observation, since studies have shown that regional integration, in general, reduces the impact of exchange rate volatility on trade (see, for instance, Frankel and Wei, 1993) by implementing policies to promote macro co-ordination. One of the stated purposes of the European Union, for instance, was to reduce exchange rate uncertainty and to avoid exchange rate misalignment among European countries to promote intra-trade and investments (see Dell'Ariccia, 1999).

In this section, we investigate the direct effects of exchange rate volatility on intra-trade between the two major Mercosur's members. This implicitly gives a measure of the gains in bilateral trade from coordination of exchange rate policies. Theoretical models[13] on the relation of exchange rate variability and international trade indicate an ambiguous effect of changes of the former on the latter. Since countries within Mercosur present a total lack of macroeconomic co-ordination, the study of the effects of exchange rate variability on trade among its members may add new insights to the empirical literature on the determinants of trade.

[10] The Economist (March 31st, 2001).

[11] Bevilaqua (1997), Eichengreen (1988) explain this idea very well.

[12] VEJA (March 30th, 2001).

[13] Caballero and Corbo (1989) shows that increases in the volatility of the real exchange rate may decrease exports and imports depending on the level of risk averseness of individuals. Their model shows that since export firms have the profit function convex on prices, firms tend to increase exports and imports given an increase in exchange rate volatility. However, individuals are risk-averse and an increase in real exchange rate volatility decrease their savings, and therefore the export firms' capital. Then, we have an ambiguous result.

We use the following export supply equation to measure the impact of changes in risk on trade between Brazil and Argentina.[14]

$$\log(X_{it}) = \beta_0 + \beta_1 \log(\mathrm{BRER}_{it}) + \beta_3 \mathrm{VOL}_{it} + \beta_4 \log(\mathrm{Y}^*_{it}) + \alpha_i + \mu_{it},\ i = \mathrm{AR},\ \mathrm{BR} \qquad (1)$$

where X_{it} represents the exports of Argentina (Brazil) to Brazil (Argentina) at period t; BRER_{it} is the bilateral real exchange rate of Argentina (Brazil) with respect to Brazil (Argentina);[15] VOL_{it} is our measure of exchange rate variability of Argentina (Brazil) at time t (see below the method we used to calculate it); Y^*_{it} is a measure of the trade partner level of activity (GDP); α_i is a time invariant country specific error; and μ_{it} is the remaining disturbance. In all regressions we include a trend and a set of seasonal dummies.

The theory suggests that an increase in the BRER reflects a decrease in the relative cost of producing tradable goods, therefore we expect that exports depend positively on BRER. We also expect that exports depend negatively on the variability of the bilateral exchange rate (VOL), and positively on the level of foreign activity (Y^*). We use quarterly data from 1990I to 2000IV.

To compute the bilateral exchange rate variability we use the traditional approach (see Kenen and Rodrick, 1986; Gonzaga and Terra, 1997) and calculate the standard deviation of the monthly bilateral effective exchange rate changes, in which the standard deviation is taken over the 12 months preceding the observation. Fig. 4 displays our measure of exchange rate volatility from 1990M12 to 1999M12. Notice that this variability follows a different pattern for the three phases identified previously. In particular, Fig. 4 shows that stabilization plans are an important source of real effective exchange rate volatility in the two countries, which is consistent with the findings of the literature (for instance, see Gonzaga and Terra, 1997). Finally, notice that exchange rate volatility is higher in Brazil than in Argentina, reflecting the more flexible Brazilian exchange rate regime.

What are the effects of the volatility displayed in Fig. 4 on the export flows between Brazil and Argentina? The regression results shown on Table 3, shed some light on this question. First, let us discuss some technical issues. In order to identify the country-specific differences, we first estimate the export equation for each country separately. The Durbin–Watson statistic for the Brazilian and Argentinean export equations (columns 1 and 4) suggests that we cannot accept the null hypothesis of absence of serial correlation. We use the standard Cochrane–Orcutt method to deal with the presence of serial correlation in the errors (columns 2, 3, 5 and 6). To estimate the pooled export equation we use the fixed-effects method (columns 7 and 8),[16] that allows for country-specific disturbances and assumes the

[14] See Gonzaga and Terra (1997), Bevilaqua (1997), Sauer and Bohara (2001). The generalized export supply equation can be found in Bergstrand (1989).

[15] We follow Edwards (1989) to calculate the bilateral effective exchange rate. It is measured as the relative price of tradable to non-tradable goods: $\mathrm{BEER} = (e \cdot \mathrm{PPI}^*)/\mathrm{CPI}$, where e is the domestic currency price of foreign exchange, PPI* is the trading partner's producer price index, and CPI is the domestic country's consumer price index. PPI* and CPI are the proxies for the price of tradable and non-tradable goods, respectively (see Edwards, 1989 for more details).

[16] Hausman (1978) specification test confirms the appropriateness of the fixed-effects estimator.

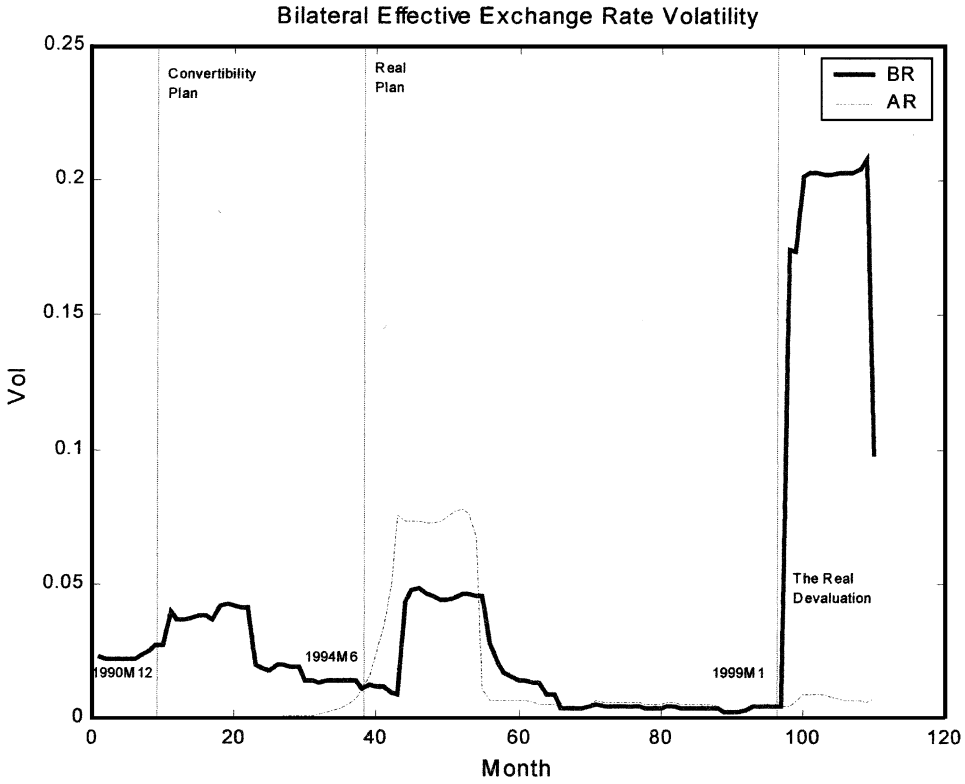

Fig. 4. Monthly bilateral (Argentina and Brazil) exchange rate volatility.

presence of correlation of the regressors with the country-specific errors.[17] However, in order to deal with both cross-sectional and serial correlation, we use feasible generalized least square (FGLS) method (columns 9 and 10).

Notice that in some regressions (columns 3, 6, 8 and 10) we also added exchange rate variability of the trade partner to investigate how the exchange rate policies in the trade partner affect domestic exports. The sign of the estimated coefficients for all regression models are in accordance to what we postulated previously. If GDP in Brazil increases by 1%, the estimates from Cochrane–Orcutt and FGLS suggest that Argentinean exports will increase from 1.21 to 2.12%. The effect of Argentinean GDP on Brazilian exports is stronger (1.21 to 4.53%). In addition, exchange rate variability has a negative (statistically significant—except in columns 5 and 6) impact on bilateral exports for Brazil and Argentina, and the effects are stronger for

[17] See Johnston and DiNardo (1997). In addition, when the time period is larger than the number of observations the fixed effects model yields consistent and asymptotically efficient estimates (see Hsiao, 1986).

Table 3
Regression results—export equations

	Argentina			Brazil			Pooling regression			
	1	2	3	4	5	6	7	8	9	10
BEER	0.044 (0.009)[b]	0.071 (0.016)[b]	0.061 (0.011)[b]	0.418 (0.152)[b]	0.147 (0.288)	0.124 (0.272)	0.026 (0.006)[b]	0.027 (0.005)[b]	0.056 (0.013)[b]	0.056 (0.012)[b]
VOL	−2.04 (0.623)[b]	−1.164 (0.678)[b]	−1.52 (0.605)[b]	−1.862 (0.683)[b]	−0.824 (0.858)	−0.677 (0.709)	−0.759 (0.293)[b]	−0.777 (0.277)[b]	−0.915 (0.393)[b]	−0.667 (0.389)[a]
Vol[c]			−0.615 (0.233)[b]			−0.639 (1.264)		−0.845 (0.276)[b]		−0.508 (0.233)[b]
Y[c]	3.146 (0.828)[b]	1.125 (0.875)	2.127 (0.830)[b]	2.458 (1.739)	3.908 (1.858)[b]	4.538 (0.954)[b]	4.829 (0.314)[b]	4.947 (0.298)[b]	1.21 (0.623)[b]	1.416 (0.597)[b]
N	37	36	36	37	36	36	74	74	74	74
Adj-R^2	0.926	0.624	0.816	0.836	0.488	0.491	0.776	0.885		
DW	0.771	2.003	2.274	0.927	1.752	1.773				

[a] Significance at the 10% level.
[b] Significance at the 5% level.
[c] Bilateral exchange rate variability of the trade partner.
Figures in parenthesis are standard errors.

the Argentinean equation.[18] The average volatility for the pooled data was 0.025. If this volatility increases by 10%, estimates based on FGLS method suggest that exports will decrease by approximately 1%. Therefore, changes in exchange rate policies, such as when the Real lost almost 50% of its value in 1999, can indeed hamper commercial integration in the region. This in turn, can be reinforced by the formation of lobby groups demanding the introduction of trade barriers (when the level of import penetration increases) to protect domestic industry from external competition. Moreover, once protection is granted, it is not easy to remove it (see Trefler, 1993).

3.2. Exchange rate variability and trade protection

3.2.1. Description of the problem

The swings of real exchange rates generated by un-coordinated macroeconomic policies have an indirect impact on trade volumes through their stimulus on lobbying activities for protection. For a given level of protection, prolonged real exchange movements may increase import penetration ratios. According to the literature on the political economy of trade policy,[19] changes in import penetration ratios will increase the demand for protectionist measures in order to decrease the adjustment costs of the loss of competitiveness.[20] Once protection is given, it is not easy to reduce it even if there is a reversal in the real exchange rate.

The approach adopted to explain the existence of trade barriers between Brazil and Argentina is that explanatory variables of protection are determined by a bargain between sectorial lobbies (demand side) and the politicians (supply side). In this approach lobbies are able to take action to obtain protection from the politicians that supply protection trying to maximize their self-interest objectives.[21] For instance, although politicians may care about the efficiency in the economy,[22] knowing that protection decreases the aggregate welfare of the economy, they also want to be re-elected (see Grossman and Helpman, 1994, as an example) or elected (see Magee

[18] The results here are in accordance with Sauer and Bohara (2001) who found that exchange rate volatility has a negative impact on exports for Latin American and African countries.

[19] A good example of the effects of changes in import penetration in trade policy can be found in Lael and Verdier (1994). A review on political economy of trade policy can be found on Rodrik (1995).

[20] Trefler (1993) is a good example of empirical study that presents evidence that an increase in import penetration ratio results in greater protection.

[21] There are other possible choices. For instance, we could have used the median voter approach or the political support function approach. Both approaches use the fact that the objective function maximized by the policymaker shows some preference for certain distributional outcomes (Rodrik, 1995, pp. 1464–1465). An example of empirical work using ideas contained on these approaches is Esfahani and Leaphart (2000).

[22] In this scenario we need constant returns to scale and perfect competition so that strategic trade policy is excluded as an option to increase welfare. Also note that since we are analyzing two countries that are trying to implement in full a free trade area, we will not study any gain in protection regarding changes in the terms of trade. This point would be important when studying the formation of Mercosur's common external tariff. A good empirical study about the common external tariff of Mercosur is Olarreaga et al. (1999). See also Olarreaga and Soloaga (1998), Flôres et al. (2000).

et al., 1989, as an example) and therefore need the money of the lobbies to spend in their campaigns.

This approach was chosen since the literature considers it to be the most useful (see Esfahani and Leaphart, 2000, p. 2, and Maggi and Goldberg, 1999) and because there exists evidence that lobbies were important players in Argentina (see Inter-American Development Bank, 2000, pp. 36–49) when the Brazilian currency crisis of 1999 took place. For instance, the association of rice and footwear producers (lobbies) negotiated voluntary export restrictions between Brazil and Argentina after pressing their governments for protection.[23]

We test whether increases in the import penetration ratio are significant and have the predicted positive sign in explaining protectionist measures affecting trade between Brazil and Argentina. If they are significant and have the predicted sign, we can conclude that coordination of macroeconomic policies is important since this reduces real exchange rate misalignments and, as a consequence, reduces increases in protection resulting from changes in the import penetration ratios.

We use a trade barrier equation (as examples the reader can see Trefler, 1993; Olarreaga and Soloaga, 1998; Esfahani and Leaphart, 2000) to test if variations in the import penetration ratio are important in explaining higher levels of protection and have the positive predicted sign. The data used in this equation applies to 1995 Argentinean and Brazilian primary and manufacturing sectors found in the GTAP (Global Trade Analysis Project) database.[24] Data for 1992, obtained from the GTAP database, was used to elaborate the variation of import penetration variable for each sector. Part of the political economy variables data is the same as that used by Olarreaga and Soloaga (1998).[25]

The trade barrier equation explains bilateral (Brazil and Argentina) sectorial import tax[26] through some variables proposed in the literature that represent costs and benefits of lobbying for protection, and also variables important to the supply of trade protection according to the political economy of trade policy. Therefore, we examine if at a specific point in time variations in import penetration ratios are important on average to explain higher levels of protection between Brazil and Argentina. We can write our equation as follows:

$$T_{ki} = \beta_0 + \beta_1 M_{ki} + \beta_2 \Delta M_{ki} + \beta_3 IS_{ki} + \beta_4 C_{ki} + \beta_6 U_{ki} + \beta_8 IT_{ki} + \alpha_i + \varepsilon_{ki} \text{ for } i = \text{AR, BR} \quad (2)$$

[23] One of the forms of pressure included using provincial (or state) courts to get special protection against imports. Obviously when the association of producers get some type of trade protection in a provincial (or state) court, the governments start to incentive a negotiation between the producers in order to avoid a possible trade war between Brazil and Argentina. Note that the literature does not mention a consumers association of any kind.

[24] See Hertel (1997) for details on the GTAP database.

[25] The variables are the concentration, union and intraindustry trade indices.

[26] Import taxes mean net import tariffs, i.e. we are taking into consideration not only import tariffs but also import subsidies. A positive point of this measure of protection is that we may have negative values, since import subsidies may be larger than import tariffs. Therefore, we do not need to worry about bias in our econometric estimate originated by censored data. For information on the import tariff data see Hertel (1997, pp. 87–104).

where T_k is bilateral (Brazil–Argentina) import tax in sector k; M_k is bilateral import penetration ratio in sector k; ΔM_k is variation (between 1995 and 1992) of bilateral import penetration ratio in sector k; IS_k is the input sale index of sector k; C_k is the firms concentration index[27] for seller firms in sector k; U_k is the labor unionization index of sector k; IT_k is the bilateral intra-industry trade index of sector k. The disturbance ε_{ki} is considered to be normally distributed.

3.2.2. Description of the data and estimation procedure

The GTAP database for 1992 presents 37 sectors in the 1992 version and 50 sectors in its version for 1995. Therefore, we aggregated the data for the primary and secondary sectors from the 1995 database to the correspondent sectors contained in the 1992 database.[28] Sectorial output was used as weight when one sector from the 1992 version corresponded to more than one sector in the 1995 version. Data for sectorial concentration, unionization and bilateral intra-industry was aggregated from secondary sectors of ISIC level 3 to the secondary sectors of GTAP database for 1995 and then aggregated to the correspondent sectors of GTAP database for 1992.[29]

The sectorial bilateral import penetration ratio was calculated as the division of imports by the sum of output and net imports for each sector.[30] The literature predicts an ambiguous impact of the level of import penetration ratio over sectorial protection. In a model with trade taxes but without quantitative restrictions on imports and exports, and where obtaining public funds does not distort consumption allocation, the standard prediction[31] is that the greater are imports relative to the domestic consumption, the greater is the loss of welfare from protection (see Grossman and Helpman, 1994, p. 842). However, if the model includes quantitative restrictions (like quotas or VERs) on imports and exports and where a receipt of public funds distort consumption allocation, the standard prediction does not hold in many cases.[32]

The industrial concentration index is calculated as the number of firms in one sector divided by the total number of firms in the economy. Since more concentrated firms have lower opportunity costs of lobbying by the reduction of the free rider problem in the coordination of the lobby, we expect that the concentration index coefficient be negative (see Rodrik, 1987).

The input sale index is calculated as the sectorial sale used as inputs by other sectors scaled by the total sectorial output. We expect that the input sale index has a negative impact on protection since other industry lobbies would try to counter-

[27] This index is the one used by Olarreaga and Soloaga (1998) and measures the concentration of firm establishments.

[28] The total number of primary and secondary sectors in the 1995 version is 42 and 31 in the 1992 version.

[29] See the GTAP database manual (Chapter 8, pp. 15–17) for the secondary sectors aggregation from ISIC level 3 to GTAP database version 4 (1995). For details on protection data see Chapters 4 and 13 of this manual.

[30] Same procedure was used in Trefler (1993).

[31] In the sense found in Maggi and Rodriguez-Clare (2000).

[32] This point can be found in Maggi and Rodriguez-Clare (2000).

lobby any increase in protection of the sector from which they buy many intermediate goods. In the case of the union and intra-industry trade variables, we calculated in the same way and used the same data as in Olarreaga and Soloaga (1998). In both cases we expect the coefficient for both variables to have a positive effect on sectorial protection, which is the consensus in most of the literature on the political economy of trade (see Olarreaga and Soloaga, 1998; Trefler, 1993).

Eq. (2) constitutes a panel model since we have two countries and individual effects for each sector. The estimation procedure adopted should take into consideration the nature of the individual effects, i.e. if they are randomly generated or are fixed but unknown constants differing among sectors. Besides, both the theoretical and empirical literature[33] indicate that the import penetration ratio is endogenous in Eq. (2). We need to test if correlation between the regressors and individual effects and an endogeneity problem in the level of import penetration variable exist in the model described by Eq. (2). The Hausman (1978)[34] test is an adequate tool to handle this task.

In this paper the null hypothesis would be the non-existence of endogeneity problems caused by the correlation of individual effects with the regressors and the presence of orthogonality of the import penetration ratio with respect to the remaining disturbance. The alternative hypothesis that will be used present correlation of the regressors with respect to individual effects and correlation of the import penetration ratio with respect to the equation disturbance.

Using this null and alternative hypothesis, the efficient and consistent estimator under the null is the random effect estimator (see Hausman, 1978, p. 1263, and Hausman and Taylor, 1981, pp. 1382–1387) and the consistent estimator under both hypothesis is a fixed effect model using instrumental variables[35] (FEIV) to deal with the endogeneity problem of the import penetration ratio. One also notes that a fixed effect model automatically deals with the endogeneity problem between the regressors and individual effects.

The question of which instruments[36] to use to control the endogeneity of the import penetration ratio and calculate Eq. (2) by fixed effects, still remains. Most analysts usually consider the sectorial factor shares as correlated with the import penetration ratio, but not with the trade protection.[37] The argument is that factor

[33] Using a system of equations to capture the impact of trade barriers on US imports, taking into account that protectionist measures are endogenous, i.e. trade protection is partially explained by imports and vice-versa, Trefler (1993) estimated that the impact of non-tariff barriers have a 10 times larger impact than previous estimates that did not considered protection endogeneity.

[34] See Hausman (1978, pp. 1252–1253). The basic idea of the Hausman test is to compare two estimators, which under the null hypothesis are both consistent, one of them, is the fully efficient estimator, and under the alternative hypothesis just the less efficient estimator under the null hypothesis remains consistent.

[35] It should be highlighted that IV estimators provide consistent estimators that in general are biased. See Davidson and MacKinnon (1993, p. 217).

[36] Using a large number of instruments may provide asymptotic more efficient estimators in large samples. However, in finite samples the more instruments used the more biased is the IV estimator. See Johnston and DiNardo (1997, p. 157).

[37] See Maggi and Goldberg (1999, p. 1143), and Esfahani and Leaphart (2000, pp. 9–10).

shares are correlated with the import penetration ratio since they indicate how well an industry matches with the country's comparative advantage and therefore how well it can compete against imports.

The GTAP database provides data about primary factor (labor, capital, land and natural resources) earnings by sector. Following the usual procedure[38], we estimated factor shares as the total earning of the factor in a sector divided by total output of the sector. Then, in order to eliminate the endogeneity problem of the import penetration ratio, we ran by OLS, using pooled data for Brazil and Argentina, the following equations[39]:

$$M_k = \alpha_1 NR_k + \alpha_2 T_k + \alpha_3 L_k + \alpha_4 Ke_k + \mu \quad (3)$$

where L_k is labor share in sector k; K_k is capital share in sector k; NR_k is natural resource in sector k; T_k is land share in sector k. It is also assumed that disturbances in both equations are normally distributed.

Estimating Eq. (3), we obtain an estimate of the import penetration ratio without endogeneity problems that can be used to estimate Eq. (2).[40] Eq. (3) can be called a 'first stage'[41] to estimate Eq. (2) without the possible endogeneity problem of the import penetration ratio. Using the estimated sectorial import penetration ratio from Eq. (3), we apply a fixed-effect (FEIV) model to estimate the Hausman test statistic described above. This test statistic achieved a value of 70.56 and therefore we reject the null hypothesis[42], i.e. the FEIV model is the one that should be used. The estimates of Eq. (2) using the FEIV model can be seen in Tables 3 and 4.

Table 4 shows the estimation of Eq. (2) with different sets of explanatory variables. One observes that whatever the set of variables, the coefficient for the variation of import penetration variable is positive and significant. It clearly indicates that the large swings in real exchange rate produced by divergent macroeconomic policies of Brazil and Argentina cause the appearance or intensification of protective measures through the lobbying of sectors that lose market-share to imports.[43]

One also notes that the input sales variable is significant and has the expected sign. The concentration index variable also has the expected effect on sectorial protection, but is not significant. In the case of the import penetration variable, its

[38] For instance see Trefler (1993, pp. 148 and 157).

[39] Another option would be to estimate a system of equations like Eqs. (2) and (3) but adding trade barrier proxy (in our case import taxes) in Eq. (3). See Trefler (1993). However, we are not interested in estimating the impact of protection on the import penetration ratio. Then, we chose this easier method.

[40] By the description of our method we are using a particular method by which IV estimates can be computed. See Davidson and MacKinnon (1993, p. 220).

[41] In analogy to the 2SLS estimator.

[42] Comparing with the critical value provided by a Chi-square distribution with six degrees of freedom.

[43] We ran the same regressions using a country dummy variable and dummy variables for the automotive and sugar sectors. Since none of these dummies were significant, we decided not to report the coefficients of these regressions.

Table 4
Internal trade and political economy in Mercosur

Variables	1	2	3	4
Import penetration (estimated)	−0.12	5.02[a]	4.68[a]	4.68[a]
	(1.74)	(1.97)	(2.04)	(2.16)
Variation in import penetration	1.77[a]	2.7[a]	2.75[a]	2.74[a]
	(0.85)	(1.26)	(1.28)	(1.37)
Input sales	0.04	−0.26[b]	−0.27[b]	−0.27[b]
	(0.09)	(0.08)	(0.08)	(0.09)
Union		−2.78	−2.62[b]	−2.65[a]
		(0.66)	(0.69)	(1.02)
Intraindustry				0.05
				(1.28)
Concentration			−0.4	−0.37
			(0.46)	(0.77)
Number of observations	62	30	30	30
F-Test	1.52	6.49[b]	5.2[a]	3.90[a]

[a] Significant at 95%.
[b] Significant at 99%.
Note: Standard errors are in parenthesis and *F*-test designated to test if all variables are different than zero.

positive value has been found in other studies[44] and, as we have already said, theory's prediction of the coefficient of this variable is ambiguous.

However, the union index variable is significant, but do not have the expected effect on protection. This result might be due to the lack of better data to elaborate the index. For instance, in studies of protection in the United States, much use is made of campaign contributions to elaborate the unionization index (see Maggi and Goldberg, 1999; Trefler, 1993). Unfortunately, these kind of data are not available for Brazil and Argentina.

4. Conclusions and policy implications

In this paper we have shown that the lack of macroeconomic and exchange rate coordination policies in Mercosur have been an impediment to bringing the full potential trade benefits of a common market to the region. It has caused substantial amounts of price and exchange rate fluctuations. In the second section of this work we showed data regarding trade integration among the major economies in Mercosur and also described how different their macroeconomic policies are since the creation of Mercosur through the Asuncion Treaty.

In Section 3 we analyzed the impacts on trade of the lack of macroeconomic coordination between Brazil and Argentina. The divergent macroeconomic policies of

[44] For instance, see Olarreaga and Soloaga (1998, pg. 305 and 314). One reason for the unexpected sign of the coefficient for import penetration could be the use of this variable and the union index in an additive form in the set of explanatory variables. It might be better use an interactive form between these variables. See Maggi and Goldberg (1999, p. 3).

these economies have had negative effects on bilateral trade due to the risk averseness of exporters and importers, and due to the protectionist forces they have brought forth. Using econometric tools this work showed that an increase of 10% in the bilateral effective exchange rate volatility, which was the measure of risk used in this paper, between Brazil and Argentina decreases in 1% of bilateral exports for these economies.

In the same section we also analyzed the impact of the lack of macroeconomic coordination on trade through the existence of protectionist forces brought forth by lobbies. Dealing with the endogeneity problem between trade barriers and the import penetration ratio, we use a fixed-effects panel data regression to show that the variation of the import penetration ratio has a positive and significant effect on average to the existence of higher bilateral trade barriers for Brazil and Argentina. Thus, it shows that in the case of Mercosur the large swings in bilateral effective exchange rate indirectly cause the creation of trade barriers within the trade block.

Although not analyzed in this paper, but worth mentioning in the context Mercosur, is that during the nineties there occurred a major increase of foreign direct investment (FDI) flows to the region (Table 5), mainly to Argentina and Brazil, which was a consequence of the liberalization policies[45] adopted in the region. Not only is the size of FDI net inflows similar in the two main economies of Mercosur, but they also present similarities in the strategies of multinational firms investing in these countries. The service sector was the most important destination of FDI, mainly connected with the privatization of public utilities.[46] The substantial share of FDI inflows into services, which are mostly non-tradables, raises questions about possible future problems in the balance of payments of both countries. These activities generate few inflows of foreign exchange, but raise profit remittances.

Following Bevilaqua, Catena and Talvi (2001) the swings of bilateral real exchange rate between Brazil and Argentina can generate confrontations between these economies regarding the allocation of FDI in sectors whose output is composed of regional goods, i.e. goods that are mostly traded within a preferential trade agreement like Mercosur. Although FDI in privatized Argentinean and Brazilian public utilities did not generate bilateral problems since their outputs are mostly traded domestically, changes of real effective exchange rates could prove problematical. This may be the case of privatized companies when they purchase equipment for maintenance and expansion, since these are often regional goods, such as generators for power plants. In addition, FDI inflows directed to the manufacturing sectors whose output are composed by regional goods have also been an issue

[45] By the liberalization process we mean the decrease of restrictions to foreign capital in many sectors and the implementation of the privatization processes with minor restrictions to the participation of foreign capital. It also included guarantees to foreign capital against opportunistic behavior. See Urbiztondo (1998, pp. 465–466).

[46] In 1998 they accounted for 74% in Argentina and in 1999 for 73% in Brazil (Baer and Miles, 2001).

Table 5
Latin America and Mercosur: net inflows of foreign direct investment, 1990–2000 (millions of dollars)

	1990–1994[a]	1995	1996	1997	1998	1999	2000[b]
Latin American Integration Association (LAIA)	14 249	27 789	41 301	61 125	66 025	85 571	67 191
Brazil	1703	4859	11 200	19 650	31 913	32 659	30 250
Argentina	2982	5315	6522	8755	6670	23 579	11 975
Mexico	5430	9526	9186	12 831	11 312	11 786	12 950

Source: Economic Commission for Latin America and Caribbean (2000), p. 3.
[a] Annual average.
[b] Estimatives.

causing confrontations between Brazil and Argentina, since these flows have been influenced by the swings in the bilateral real exchange rate.[47]

It is thus clear that without policy coordination and a gradual unification of exchange rate policies, Mercosur's chances of success will be substantially diminished. In fact, our findings would sustain Barry Eichengreen's conclusion that 'If…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' (Eichengreen, 1988, p. 33).

Although the complete implementation of a monetary union between Brazil and Argentina seems at least a decade away (Giambiagi, 2001), and even taking into account that the ex-ante qualifications of the two countries to form an optimal currency area are debatable (Giambiagi and Rigolon, 1998, p. 17), the idea to create a common currency for the two main countries of South America is gaining popularity in the agenda of politicians.

If the creation of a common currency for Brazil and Argentina is essential to the deepening of the integration process in Mercosur in the long run, macroeconomic co-ordination (Giambiagi, 2001, p. 150) in the short-run is important to achieve this long run objective. As shown above, the differences in the macroeconomic policies of Brazil and Argentina result in trade and investment strains incompatible with the formation of a true common market in South America.

As well described in the literature a monetary union has advantages and disadvantages. Among the former are: (1) increased efficiency resulting from an expanded market; (2) the elimination of the uncertainties associated with exchange rate volatility; and (3) the creation of a supra-national central bank with a clear mandate to keep inflation low and thus eliminate the risks of investing in the region and by keeping interest rates low, increase the investment levels within the region. The main cost of monetary unification would be a reduction of sovereignty over monetary and exchange rate policies (Giambiagi, 2001, pp. 123–124).

The increase of macroeconomic co-ordination between Brazil and Argentina in the short-run affects the costs and benefits of a monetary union involving these countries. Since economic policy coordination could promote trade between these

[47] For instance, the automobile industry is the most important sector in the trade and investment relations between Argentina and Brazil, representing one third of trade between the countries. In the case of Mercosur, automobiles are clearly a regional good, given that 90% of Argentinean exports of cars have as their destination the Brazilian market. As we mentioned, no new investments were made in Argentina's automobile sector after the devaluation of the *real* in January 1999. It was reported that Argentinean executives feared that the parent offices of multinationals would continue to transfer operations to Brazil, where production costs were 25–30% lower than in Argentina. Also, a number of components producers were closing down in Argentina, transferring their operations to Brazil. The Argentinean government reacted by demanding that assembly plants located in Argentina increase their purchases of components produced in Argentina and that component producers located in Brazil set up production facilities in Argentina. See: 'Montadoras abandonam Argentina,' in VALOR, 27th, 28th and 29th July 2001, p. B1; and 'Setor representa um terço de comercio entra Brasil e Argentina,' in O Estado de São Paulo, 17th August 2000.

countries, it would induce higher efficiency gains with the monetary union since these two economies would be more integrated. It is also worth noticing that economies with higher and similar levels of fiscal and monetary performance would attract higher levels of investment due to the reduction of investment risks.

Thus, macroeconomic co-ordination between Brazil and Argentina is a key not only in the strengthening of the economic relations between these two countries, but also in strengthening Mercosur. If not by its short-run effects, policy co-ordination between the two main economies in Mercosur would help to build the road to economic prosperity in the long run.

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