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WHO WINS IN SOUTH-SOUTH TRADE AGREEMENTS? NEW EVIDENCE FOR MERCOSUR

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Using a detailed database on intra-MERCOSUR tariffs, we estimate the effect of tariff preferences on the origin of imports of MERCOSUR members. The results show tariff preferences affected imports patterns in the cases of Argentina and Uruguay, and to a less extent also those of Brazil. For the first two countries the results support the hypothesis that MERCOSUR has produced a diversion of trade, no similar evidence is found for Brazil and Paraguay.

JEL classification codes: F12, F13, F15
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I. Introduction

There exists an extensive empirical literature on the effects of regional integration on the patterns of trade and specialization of countries engaged in such processes. A

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widely used approach in this literature involves the estimation of a "gravity equation" where trade between members of a regional agreement is identified with a dummy variable. The magnitude and statistical significance of the estimated coefficient for this variable is a measure of the importance of the agreement under analysis. Previous studies found a statistically significant effect for the case of MERCOSUR (e.g., Frankel 1997, and more recently Mayer and Zignago 2004). Yeats (1998) finds that most dynamic products in MERCOSUR's intra-trade are generally capital-intensive goods in which members do not display a strong export performance in foreign markets; this suggests that MERCOSUR's own trade barriers may be responsible for trade changes in these sectors, which are also the sectors with Most Favoured Nations (MFN) tariff rates above average. These findings prompt the author to suggest the existence of a detrimental effect of MERCOSUR on country members as well as on third countries. However, the possibility to distinguish among various different forces behind the increase in the intensity of intra-regional trade, such as geographical factors, trade complementarity, etc., versus those related to the evolution of tariff preferences is highly restricted by the availability of suitable data.

The aim of this paper is to analyze the role of tariff preferences under the MERCOSUR on the pattern of imports of its country members -Argentina, Brazil, Paraguay and Uruguay- between 1991 and 2004. In order to do this, and within the theoretical framework of Dixit and Stiglitz (1977) and Krugman (1980), we use a recently developed database of intra-MERCOSUR tariffs which is available at a great level of detail (MERCOSUR Secretariat, 2005). The paper is structured as follows. Section II presents a brief summary of the evolution of MERCOSUR's trade policy and patterns of trade. In Section III we derive an estimable equation to explain the changes in the regional origin of imports. Section IV presents and analyses the econometric results from the estimated equation and some simulated exercises. Section V summarizes the main findings of the paper.

II. Trade policy and patterns of trade

A. Trade policy under the MERCOSUR: a brief summary[1]

The MERCOSUR was conceived to establish a custom union. In this process we can identify two phases. In the first phase, from 1991 to 1994, the agreement can

[1] Others aspects of the integration process, such as Rules of Origin and Safeguard clauses, are not included in this brief summary.

be characterized as a free-trade area, with each country retaining its power to establish its own trade policy with respect to non-members. The signing of the Treaty of Asunción (TA), in 1991, constitutes the cornerstone of MERCOSUR. The TA outlined the timetable for the gradual increase of tariff preferences among MERCOSUR's members, while specific timetables were agreed for goods already covered by previous preferential agreements. To attend the particular situation of some sectors, the TA included also a temporary exemption regime. Additionally, two sectors were not included into the MERCOSUR agreements: the automotive industry regulated by bilateral agreements; and the sugar sector.

The second phase started in 1995, when the members set forward a convergence process to a common trade policy toward third countries. According to the original timetable agreed in 1991, from January 1995 all trade among MERCOSUR's members was supposed to be free of any trade barrier; however, this was not the case. As with the TA, in 1994 a new timetable was agreed for a limited number of goods, with this regime known as the Adaptation Regime to MERCOSUR (ARM). The ARM constituted a reissue of the exemption lists that were in force between 1991 and 1994. The ARM allowed each member to select a number of goods to be temporarily exempted from the requisite of a 0% intra-zone tariff. By the beginning of the current decade all imports reached by MERCOSUR agreements were subject to a 0% tariff. In this second phase, however, both the automotive and the sugar sectors were deliberately left out from the universal trade liberalization program.[2]

In line with the objective of establishing a Common Market, in 1995 MERCOSUR members agreed on the implementation of a Common External Tariff (CET) to be applied on imports from outside MERCOSUR. The CET has a multi-tiered tariff structure, ranging from 0% to 20%, increasing by two percentage points. The general principle is that tariffs increase with the share of added value of the goods subject to the tariff. Other criteria have been also considered, such as the existence of local/regional production. In general, for those goods not included into the exemptions to the CET, the highest rates are applied to final consumption goods; in the other extreme we have intermediate goods; while semi-finished goods are subject to intermediate rates. At the end of 1997 there was a general increase of the CET by three percentage points, but in 2000, 2001 and 2002 it was subsequently reversed. Finally, like in the case of intra-MERCOSUR trade, temporary exemptions to the CET for five groups of goods can be identified: capital goods; telecommunication and informatics; sugar; automotive; and countries' lists.

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[2] These two sectors are still not within MERCOSUR framework.

B. Patterns of trade

In this section we present an analysis of the patterns of trade for the period 1993-2004 using Balassa's Index of Revealed Comparative Advantage (RCA). The RCA index for sector i in country j is defined as $RCA_i^j = \frac{X_i^j / \sum_i X_i^j}{X_i^W / \sum_i X_i^W}$, where X stands for exports, while the superscript W makes reference to world values. The RCA indices are calculated at 4 digits of the Harmonized System (HS) using data for the year 1993. We are interested in looking at the evolution of trade patterns within the MERCOSUR *vis-à-vis* trade with the rest of the world (ROW),[3] and comparing them with those existing at the beginning of the integration process. Due to the availability of data about how countries record their trade statistics, RCA indices are calculated using trade flows for the year 1993; the earliest year for which homogeneous world and MERCOSUR data exists.

According to the pattern of the RCA index for each member of MERCOSUR, the following 16 groups of sectors were identified:

(i) 4 groups where $RCA_i^j > 1$ for only one member of MERCOSUR (A, B, P, U);
(ii) 6 groups where $RCA_i^j > 1$ for two members of MERCOSUR (AB, AP, AU, BP, BU, PU);
(iii) 4 groups where $RCA_i^j > 1$ for three members of MERCOSUR (ABP, ABU, APU, BPU);
(iv) 1 group where $RCA_i^j > 1$ for the four members of MERCOSUR (ABPU);
(v) 1 group where $RCA_i^j > 1$ for neither of the member of MERCOSUR (NONE).

Table 1 presents the structure of trade with the ROW for the period 1993-2004 according to the 16 groups identified above. The main picture emerging from the data is that the patterns of trade specialization are coherently related with the patterns of the RCA index. Most of the exports are explained by sectors where countries had in 1993 a RCA, while most of the imports correspond to sectors where other MERCOSUR countries did not have a RCA.

Preferential agreements favor trade between members relative to trade with non-members. Table 2 presents the structure of intra-MERCOSUR trade according to the typology that emerges from the RCA indices. It is worth noting that the group where none of the four countries had a RCA explains an important share of intra-

[3] The ROW excludes MERCOSUR countries as well as members of the Latin American Integration Association (LAIA).

Table 1. Typology of goods (HS 4 digit) by group of MERCOSUR countries with RCA in 1993. Structure of trade with ROW 1993-2004

GROUP	Argentina		Brazil		Paraguay		Uruguay	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
a) Only one country has a RCA								
A	15.4	4.5	2.5	10.2	1.8	3.4	0.6	13.0
B	2.2	11.9	25.6	8.1	2.3	16.3	0.5	10.2
P	0.3	0.2	1.4	0.2	7.9	0.1	0.7	0.2
U	0.8	4.4	0.7	3.1	0.4	3.4	7.8	5.2
b) Two countries have a RCA								
AB	12.1	8.2	13.5	9.8	0.1	6.5	1.4	5.8
AP	5.8	0.0	0.2	0.7	5.7	0.0	0.0	0.0
AU	9.7	0.4	0.3	0.7	0.0	0.1	24.1	1.0
BP	0.4	0.3	12.7	0.2	4.5	0.3	0.3	0.2
BU	0.6	2.3	4.9	1.7	0.3	3.3	2.4	2.9
PU	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.2
b) Three countries have a RCA								
ABP	31.6	0.3	14.6	0.2	57.9	0.6	0.9	0.7
ABU	2.6	0.2	3.4	0.1	0.2	0.1	14.4	0.4
APU	2.2	0.0	0.6	0.0	0.8	0.0	7.9	0.0
BPU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
c) All countries have a RCA								
ABPU	7.8	0.2	3.5	0.2	15.6	0.2	30.7	0.2
d) No country has a RCA								
NONE	8.6	67.1	16.1	64.7	2.5	65.6	7.9	60.0
The country does not have a RCA	12.8		21.8		7.6		12.2	
None of the other 3 countries have a RCA		71.6		72.9		65.7		65.2

Source: own calculations based on LAIA and COMTRADE.

Table 2. Typology of goods (HS 4 digit) by group of MERCOSUR countries with RCA in 1993. Structure of intra-MERCOSUR trade 1993-2004

GROUP	Argentina		Brazil		Paraguay		Uruguay	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
a) Only one country has a RCA								
A	28.6	2.7	2.9	27.7	6.5	5.4	1.5	7.9
B	10.5	28.6	29.4	9.3	1.2	20.2	5.6	14.9
P	0.2	0.9	0.7	0.4	5.7	0.5	0.1	1.2
U	4.1	5.2	4.6	5.5	2.2	6.1	27.9	7.6
b) Two countries have a RCA								
AB	13.6	11.6	11.4	10.9	0.6	18.8	4.8	12.4
AP	1.8	0.3	0.1	3.0	15.6	0.1	0.1	0.8
AU	6.7	0.7	0.6	9.7	0.6	1.8	26.5	2.3
BP	0.8	3.3	3.0	0.9	3.9	1.5	0.1	3.0
BU	2.6	4.6	6.1	2.0	0.4	8.5	4.0	4.3
PU	0.2	0.1	0.0	0.5	1.8	0.7	2.2	0.1
b) Three countries have a RCA								
ABP	1.4	1.3	0.9	3.6	50.5	1.8	0.1	2.0
ABU	0.3	0.6	0.7	0.4	0.2	0.6	1.5	0.7
APU	0.4	0.2	0.0	1.0	3.4	0.1	4.0	0.0
BPU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
c) All countries have a RCA								
ABPU	2.4	1.0	1.4	2.5	4.1	0.7	2.4	5.3
d) No country has a RCA								
NONE	26.3	39.1	38.2	22.6	3.3	33.1	19.0	37.3
The country does not have a RCA	44.9		47.1		15.0		31.4	
None of the other 3 countries have a RCA		41.8		32.0		33.6		44.9
Trade 1993-2004 (millions USD)	82,597	70,308	81,070	82,576	6,396	13,900	11,488	16,097
Intra-MERCOSUR (% of Total)	28.5	27.2	12.3	13.5	53.5	50.6	42.5	45.0

Source: own calculations based on LAIA and COMTRADE.

zone imports: Argentina 39.1%, Uruguay 37.3%, Paraguay 33.1%, and Brazil 22.6%. This group is the most important in the case of the first three countries, and the second most important for Brazil, after the group that has Argentina as the only country with a RCA, which accounts for 27.7% of Brazil intra-zone imports.

Similarly, goods included in the group where none of the members had a RCA in 1993 explain an important proportion of intra-zone exports in the cases of Argentina (26.3%) and Brazil (38.2%), being also the group with the highest share for Brazil and that with the second highest value for Argentina. If we consider together sectors Brazil did not have a RCA in 1993, they account for 47.1% of exports to other MERCOSUR countries, while for Argentina this percentage is 44.9%. On the other hand, there is less evidence of MERCOSUR stimulating what we may call as an "artificial" competitiveness in the cases of Paraguay and Uruguay, where the share of exports by sectors the countries did not have a RCA is lower than for the other two countries, especially in the case of Paraguay with just 15%; for Uruguay it is 31.4%. Most of Paraguay's intra-zone exports are explained by sectors the country as well as fellow MERCOSUR members had a RCA in 1993. In the case of Uruguay, the distribution of intra-zone exports is mostly explained by sectors the country had a RCA in 1993, either alone (27.9%) or simultaneously with Argentina (26.5%).

III. Theoretical and methodological issues: relative import flows

As barriers to international trade are dismantled among members of a regional trade agreement, we might expect changes in the structure of trade with other members of the agreement *vis-à-vis* the ROW. More specifically, we can expect an increase in intra-regional trade at the expense of trade with countries that are not benefited with a preferential treatment.

Given that a country's trade performance depends on a wide set of interrelated forces, it is not an easy endeavor to model the effects of trade integration on the patterns of trade of countries involved in such processes. Some authors have suggested different modeling approaches. Mayer and Zignago (2004) define a border effect measure estimating a model that explains the ratio between imports and domestic consumption. The micro-foundations behind the regression equation recall the well known model of monopolistic competition applied to international trade (Krugman 1980). Mayer and Zignago (2004) use domestic sales to normalize imports from foreign markets. This requires the same level of product aggregation for production and trade statistics; however this is hardly the case, since the latter are usually available to a much greater detail than production data. In this paper we apply this

model to derive a regression equation of regional imports relative to imports from the ROW. Our objective is to estimate the effect of regional tariff preferences over the structure of import expenditure from different origins. In particular, following Krugman (1980) we derive an equation to explain, for a given country z, the ratio of imports of good i from any two countries j and h.

Let us assume a world economy with J countries. In each country j ($j \in J$) there are I industries or sectors, with each industry i ($i \in I$) producing a set of different varieties. In each country there is a representative consumer with the following utility function:

$$U^z = \prod_{i \in I} \left(u_i^z\right)^{\theta_i^z}, \text{ with } 0 < \theta_i^z < 1 \text{ and } \sum_{i \in I} \theta_i^z = 1, \tag{1}$$

where u_i^z is a composite of all sector i's varieties equal to:

$$u_i^z = \left(\sum_{j \in J} \sum_{n \in N_i^j} \left(c\left(n\right)_i^{z,j} \right)^{\frac{(\sigma-1)}{\sigma}} \right)^{\frac{\sigma}{(\sigma-1)}}, \tag{2}$$

and $c\left(n\right)_i^{z,j}$ is the quantity consumed in country z of variety n produced by a firm of industry i located in country j; N_i^j is the number of varieties produced by sector i in country j; and $\sigma > 1$ is the elasticity of substitution. Utility maximization subject to the consumer's budget constraint means (for a matter of simplicity we obviate from now on the use of the index n):

$$c_i^{z,j} = \frac{\left(p_i^{z,j}\right)^{-\sigma}}{(P_i^z)^{1-\sigma}} \theta_i^z Y^z = \frac{\left(\tau_i^{z,j} p_i^j\right)^{-\sigma}}{(P_i^z)^{1-\sigma}} \theta_i^z Y^z, \tag{3}$$

where: $p_i^{z,j}\left(p_i^j\right)$ is the consumer (producer) price in country z (j) of every variety produced by sector i; $\tau_i^{zj} > 1$ are Samuelson's iceberg transaction costs to go from j to z; θ_i^z is the share of country z income (Y^z) expended in the consumption of varieties of sector i; P_i^z is the price index in country z of all varieties (imported and locally produced) of sector i.

From equations (1), (2) and (3) we have that the value of imports, including the proportion that melts in transit, by country z of varieties produced by sector i in country j are equal to:

$$M_i^{z,j} = N_i^j (p_i^j)^{1-\sigma} (\tau_i^{z,j})^{1-\sigma} \theta_i^z Y^z (P_i^z)^{\sigma-1}, \tag{4}$$

Using (4) we have that for any country z and sector i, the ratio between imports from any two countries j and h is given by:

$$\frac{M_i^{z,j}}{M_i^{z,h}} = \frac{N_i^j}{N_i^h}\left(\frac{p_i^j}{p_i^h}\right)^{1-\sigma}\left(\frac{\tau_i^{z,j}}{\tau_i^{z,h}}\right)^{1-\sigma}, \quad \text{for } j,h \in J \text{ and } j \neq h. \tag{5}$$

For any country j the value of production by sector i is equal to:

$$V_i^j = p_i^j q_i^j N_i^j, \tag{6}$$

where q_i^j is the scale of production of a sector i's firm located in country j. Following Krugman (1991) and assuming all countries have access to the same technology, it is possible to show that the scale of production for each firm is identical in all countries $\left(q_i^j = q_i^h = q_i,\ j,h \in J \text{ and } j \neq h\right)$. Using this result and (6) we have:

$$\frac{N_i^j}{N_i^h} = \frac{p_i^h V_i^j}{p_i^j V_i^h}, \quad \text{for } j,h \in J \text{ and } j \neq h. \tag{7}$$

Transactions costs (τ_i^{zj}) depend on the distance between markets, tariffs, and others non-tariff barriers. Transaction costs take the following form:

$$\tau_i^{z,j} = \delta^{z,j}\left(1 + \hat{T}_i^{z,j}\right)\left(1 + ntb_i^z\right), \tag{8}$$

where $\delta^{z,j}$ is a general function of the distance between countries z and j, $\hat{T}_i^{z,j}$ is the import tariff imposed by country z on imports of goods produced by sector i in country j, ntb_i^z is the *ad-valorem* equivalent of non-tariff barriers on import of goods produced by sector i. Non-tariff barriers (NTBs) are assumed to be set in a non-discriminatory way.[4] Using (8) we have:

$$\frac{\tau_i^{z,j}}{\tau_i^{z,h}} = \frac{\delta^{z,j}}{\delta^{z,h}}\left(\frac{1+T_i^{z,j}}{1+T_i^{z,h}}\right), \quad \text{for } j,h \in J \text{ and } j \neq h. \tag{9}$$

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[4] This assumption is made just for convenience since it is very difficult to obtain data on *ad-valorem* equivalents of NTBs by country partners, especially at the level of detail used in the empirical application. This lack of data is even more relevant in sectors such as the automotive industry, where an intricate set of rules regulate trade among MERCOSUR's members.

Substituting equations (7) and (9) into equation (5), the ratio of imports by country z of goods produced by sector i in countries j and h is equal to:

$$\frac{M_i^{z,j}}{M_i^{z,h}} = \frac{V_i^j}{V_i^h}\left(\frac{p_i^{z,j}}{p_i^{z,h}}\right)^{-\sigma}\left(\frac{\delta^{z,j}}{\delta^{z,h}}\left(\frac{1+T_i^{z,j}}{1+T_i^{z,h}}\right)\right)^{1-\sigma}, \quad \text{for } j,h \in J \text{ and } j \neq h. \tag{10}$$

IV. Empirical specification

Based on the model presented in the previous section, the ratio between imports by country z of goods produced by sector i from any two countries j and h is expressed as follows:

$$\ln\left(m_{i,t}^z\right) = \sum_{l=1}^{L}\beta_l \ln\left(m_{i,t-l}^z\right) + \phi_1 \ln\left(rer_{i,t}^z\right) + \phi_2 \ln\left(\text{T\_Pref}_{i,t}^z\right) + \lambda_t + \varepsilon_{i,t}^z, \tag{11}$$

where: z is the importer country member of the regional agreement; i is the 4-digit code sector according to the Harmonized System Classification; t is time;[5] $m_{i,t}^z$ is the country z's imports in year t of goods produced by sector i originated in other members of MERCOSUR (MCS(-1)) divided by country z's imports in year t of goods produced by sector i originated in ROW[6]; *rer* is the real exchange rates between country z and the other members of the regional agreement divided by the real exchange rate between country z and the ROW. The real exchange rate between z and the other members of the regional agreement is an import-weighted average of the real exchange rates between z and each member of the regional agreement. The real exchange rate between country z and the ROW is measured by the real exchange rate between country z local currency and the US dollar. *T_Pref* is the tariff preference granted to other MERCOSUR countries measured as $\left(\left(1+T_i^{z,MCS}\right)\right.$ $\left./\left(1+T_i^{z,MFN}\right)\right)$ where $T_i^{z,MCS}$ is the tariff rate imposed by country z on imports of good i originated within the MERCOSUR, while $T_i^{z,MFN}$ is the Most Favored Nation rate levied on the same good i by country z; λ_t is a time effect; $\varepsilon_{i,t}^z$ is an error term with the following structure $\varepsilon_{i,t}^z = \eta_i^z + \nu_{i,t}^z$, where η_i^z is an unobserved sector-level effect.

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[5] Argentina: 1992-2004; Brazil and Paraguay: 1991-2004; Uruguay: 1993-2004.

[6] MCS(-1): other countries but country z that are members of the regional agreement. ROW: rest of the world (includes all countries which do not benefit from a preferential treatment by country z).

Since there is no production data with the level of detail we require here, we proxy V_i^j / V_i^h with lagged values of the dependent variable. This could also be justified due to the existence of fixed costs in developing a trade relationship, such that changing the origins of imports is not costless. We estimate equation (11) separately for each MERCOSUR country.

The way equation (11) is specified resembles closely the well known gravity equation that has been widely used to study the impact of trade agreements on trade flows. However, it is important to highlight some differences. First, unlike most previous analysis looking at the effect of trade agreements on trade flows, we are not interested on how trade flows are affected in terms of their value, but instead relative to a country/partner of reference (the ROW in our case). Second, because the numerator of our dependant variable adds up imports from the other three partners we manage to avoid the long-lasting debate about finding the best way to model for pair-specific factors that has proven to be a crucial aspect of the standard gravity equation (Mátyás 1997 and 1998; Egger 2000), since we do not distinguish among imports from each MERCOSUR partner.[7] To proceed in this way has the disadvantage that we cannot control for factors that could be just specific to some bilateral relationships. Also, as we show later, the way we construct our dependent variable means that the numerator may be highly affected by imports from the largest partner within the agreement.

One way to test whether the MERCOSUR had an effect on the import patterns of its members would be through a difference-in-difference approach, estimating equation (11) for the periods before and after MERCOSUR was signed, and to test whether the coefficient ϕ_2 is the same for both periods. However, the lack of suitable data prevents us following this strategy. First, statistics on tariff preferences are not readily available for pre-MERCOSUR years. Considering the limited scope of the integration process previous to MERCOSUR, one alternative would be to assume that pre-MERCOSUR preferences were constant at their values immediately before the agreement started. A second and more difficult problem to deal with is that good classifications used before the implementation of the Harmonized System Classification (HS) at the beginning of the nineties do not allow us to homogenize the data for the years before and after MERCOSUR. Because of these restrictions, the results reported below must not be interpreted as measuring the change in the role of tariff preferences due to the MERCOSUR, but just the effect of changes in tariff preferences since the launching of MERCOSUR.

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[7] We thank an anonymous referee for bringing this point to our attention.

An important element when gauging the effects of preferential trade agreements is the presence of trade diversion. Within our stylized theoretical framework, where goods are differentiated across sectors and countries such that each variety is produced by a single producer, trade diversion is absent, at least in the usual sense of the concept: the shift in domestic consumption from a low-cost source (the ROW) to a higher-cost source (a partner of the regional agreement). However, we can still expect a partial substitution of varieties produced in the ROW by varieties produced within the agreement, which would imply the existence of what Ethier and Horn (1984) have referred to as trade modification. Trade modification is defined as the change in trade with outside countries due to the elimination of tariffs on goods traded only within the union. Furthermore, since we carry out the empirical application with some level of aggregation (four digits of the HS), we might expect the existence of some kind of trade diversion because goods sharing some common characteristics, which we may view as close substitutes, are grouped together. In order to account for the presence of trade diversion, the variable *T_Pref* is interacted with a set of dummies that have been constructed considering the existence of trade complementarities between MERCOSUR members and the ROW. Using Balassa's RCA index, a country *j* is said to have a comparative advantage in the production of sector *i* if its RCA index for that sector is larger than one; on the other hand, if the RCA index for sector *i* is equal or lower than one the country is said to have a comparative disadvantage. Table 3 describes how we construct the dummies.

In the case of the interaction between *T_Pref* and the dummy dg_1 we do not have any strong expectation on the sign of the coefficient, since the two exporter regions have either a comparative advantage or a comparative disadvantage in the goods included into this group. On the other hand, when *T_Pref* is interacted with the

Table 3. d_g^z dummies

Dummy	Exporter *j*: MCS(-1)	Exporter *h*: ROW
	sign(RCA)	
dg_1=1	-	-
	+	+
dg_2=1	+	-
dg_3=1	-	+

Notes: MCS(-1) makes reference to the other three MERCOSUR members than country *z*, e.g., when country z is Argentina, MCS(-1) refers to Brazil, Paraguay and Uruguay. A + symbol means that the exporter countries, jointly considered, have a RCA in a given good. A - symbol means that the exporter countries, jointly considered, do not have a RCA in a given good.

dummy dg_2 we effectively expect the coefficient to be negative, since for goods included into this group the other members of MERCOSUR have a comparative advantage while the ROW has a comparative disadvantage. Finally, the dummy dg_3 includes goods for which the other three members of MERCOSUR have a comparative disadvantage, while the ROW has a comparative advantage. In this case, if the coefficient for the interaction between *T_Pref* and dg_3 is negative and significant, we interpret this as evidence of trade diversion.

The dynamics involved in equation (11) means Least Square Dummy Variable (LSDV) estimators are inconsistent[8] so we follow standard fare in this area and estimate equation (11) by GMM, more specifically we use the Blundell-Bond GMM estimator.[9,10]

A. Results

When working at a relatively disaggregated level, it is not unlikely to find sectors for which import values are both very small and highly volatile from one year to another; for this reason we run equation (11) using a sample that includes those 4-digit HS codes that represented a 0.05% of the country total imports at least in ten years over the whole period. This leaves us with sectors that represent, approximately, 85% of the countries' imports. We present different results depending on whether the real exchange rate and tariff preference variables are considered exogenous, predetermined or endogenous. Following Estevadeordal et al. (2008), we also instrument *T_Pref* using preferences granted by the other three countries.[11]

Table 4 reports the results when *T_Pref* is not interacted with the group dummies. In all cases the estimated coefficients have the expected negative sign, however, they are mostly not statistically significant in the cases of Paraguay and Brazil, while they always remain statistically significant for Argentina and Uruguay. This

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[8] See Anderson and Hsiao (1981, 1982), Arellano and Bond (1991), Blundell and Bond (1998), Bruno (2005a, 2005b, 2005c), Bun and Kiviet (2003), Kiviet (1995, 1999), and Nickell (1981).

[9] All estimations were carried out using Stata's routine *xtabond2* (Roodman, 2005, 2009a).

[10] As pointed out by an anonymous referee, other alternatives are Fixed Effects in two steps where time-invariant regressors are included only in the second step, and the Hausman-Taylor estimator for heterogeneous panels applied in Serlenga and Shin (2007). However, to pursue this route would require to change the specification of equation (11), distinguishing among the origin of imports within MERCOSUR. For reasons of space we do not explore these options.

[11] We thank one of the referees for suggesting this approach.

result means that in the cases of Argentina and Uruguay, an increase in the tariff preference in sector i, measured by a reduction in $\left(1+T_i^{z,MCS}\right)/\left(1+T_i^{z,MFN}\right)$, is followed by an increase in the value of imports from other MERCOSUR countries relative to imports from countries which do not benefit from a preferential treatment. This effect appears to be slightly larger in the case of Uruguay.

A well known problem with GMM estimators is the proliferation of instruments, which affects the power of tests assessing their validity, such as the Sargan/Hansen type tests. Roodman (2009a and 2009b) casts doubts on tests with high p-values such that we do not reject the null hypothesis that the instruments are jointly valid, a result which may be influenced by the proliferation of instruments, to avoid this issue we limit to just one lag the past values used as instruments. On the other hand, he argues that one should not to be satisfied with ordinarily standard p-values, such as the 10% threshold. Following this suggestion, we find that the instruments behave poorly in the cases of Argentina and Brazil when the real exchange rate and preferences variables are both considered to be exogenous or predetermined. The null hypothesis that the instruments are valid would be rejected in almost all specifications in the cases of Paraguay and Uruguay.

When allowing for the interaction of *T_Pref* with the dummy variables (see Table 5), the estimated coefficients are statistically significant in all cases for Argentina, and all but two cases for Uruguay. For Brazil, the interactions with dg_1 and dg_2 are always significant, while for the interaction with dg_3, only in half cases we obtain a significant estimate. In the case of Paraguay all estimates are not statistically significant. The Hansen tests give the expected results when the real exchange and preference variables are not considered simultaneously to be exogenous or predetermined. However, following Roodman's advice, in the case of Uruguay some of the p-values are suspiciously high, while for Brazil the opposite is true.

For Argentina, the estimated coefficients for the interaction of preferences with the dummy variables are larger for dg_1 and dg_2; the same is true for Uruguay, although in the case of goods for which $dg_1 = 1$ the sign of the coefficient changes from negative to positive as the real exchange and preference variables are not longer considered exogenous or predetermined. For Brazil, the largest coefficient is for the interaction with the dummy dg_2; this is, the one that includes the potentially trade creating sectors.

Finally, it is of particular relevance to look at the coefficient corresponding to the interaction of *T_Pref* with the dummy dg_3. As explained before, this dummy corresponds to sectors in which the remaining three members of MERCOSUR have a comparative disadvantage and the ROW has a comparative advantage, such that

Table 4. Results from equation (11)

	(1)	(2)	(3)	(4)	(5)	(6)
rer	exogenous	predetermined	predetermined	endogenous	predetermined	endogenous
T_Pref	exogenous	predetermined	endogenous	endogenous	endogenous	endogenous
Partners' preferences as instruments	no	no	no	no	yes	yes
Argentina						
m(t-1)	0.7065***	0.7034***	0.7221***	0.7276***	0.7183***	0.7173***
	(0.0589)	(0.0587)	(0.0474)	(0.0406)	(0.0428)	(0.0393)
m(t-2)	0.1332**	0.1392**	0.1479***	0.1990***	0.1539***	0.1887***
	(0.0655)	(0.0645)	(0.0542)	(0.0453)	(0.0471)	(0.0447)
rer	-2.4548**	-0.3804	0.0384	-0.6778	-0.2398	-0.5752
	(1.0867)	(0.8712)	(0.7007)	(0.7016)	(0.6555)	(0.7352)
T_Pref	-2.0362***	-2.0720***	-2.5871***	-1.6424***	-2.1104***	-1.6128***
	(0.6233)	(0.7293)	(0.7529)	(0.6047)	(0.5470)	(0.4105)
Hansen test p-value(+)	0.068	0.059	0.313	0.124	0.339	0.157
AR(2) p-value (++)	0.849	0.855	0.882	0.699	0.946	0.755
Brazil						
m(t-1)	0.6818***	0.6818***	0.7428***	0.7104***	0.7306***	0.7093***
	(0.0611)	(0.0605)	(0.0495)	(0.0477)	(0.0462)	(0.0454)
m(t-2)	0.1082**	0.1082**	0.1771***	0.1625***	0.1743***	0.1631***
	(0.0501)	(0.0501)	(0.0432)	(0.0434)	(0.0430)	(0.0432)
rer	0.5206	0.3515	0.3503	0.6862	0.3178	0.6777
	(0.9011)	(0.8332)	(0.7484)	(0.8340)	(0.7631)	(0.8320)
T_Pref	-0.7367	-0.7809	-1.3502	-1.4594*	-0.9163	-1.2512**
	(0.8136)	(0.9280)	(0.8189)	(0.8795)	(0.6529)	(0.6334)
Hansen test p-value(+)	0.137	0.136	0.264	0.169	0.272	0.196
AR(2) p-value (++)	0.513	0.512	0.782	0.743	0.779	0.748

Table 4 (continued). Results from equation (11)

	(1)	(2)	(3)	(4)	(5)	(6)
rer	exogenous	predetermined	predetermined	endogenous	predetermined	endogenous
T_Pref	exogenous	predetermined	endogenous	endogenous	endogenous	endogenous
Partners' preferences as instruments	no	no	no	no	yes	yes
Paraguay						
m(t-1)	0.5436***	0.5493***	0.6097***	0.5821***	0.6226***	0.6022***
	(0.0846)	(0.0880)	(0.0707)	(0.0513)	(0.0653)	(0.0487)
m(t-2)	-0.0116	0.0136	0.1228	0.1031	0.1325	0.1343
	(0.2362)	(0.2459)	(0.1650)	(0.1039)	(0.1562)	(0.0998)
m(t-3)	0.4108	0.3673	0.2334	0.2084	0.2494	0.2117
	(0.3976)	(0.4097)	(0.2300)	(0.1457)	(0.2164)	(0.1385)
rer	-0.4386	-0.4565	-0.5765	-0.2711	-0.4767	-0.2257
	(0.6228)	(0.5257)	(0.5208)	(0.4961)	(0.4682)	(0.4605)
T_Pref	-0.7650	-0.8046	-2.2196*	-2.1728*	-1.0735**	-0.8054
	(0.5938)	(0.6228)	(1.2774)	(1.2571)	(0.4988)	(0.6238)
Hansen test p-value(+)	0.031	0.027	0.042	0.037	0.093	0.050
AR(2) p-value (++)	0.514	0.592	0.732	0.615	0.709	0.682
Uruguay						
m(t-1)	0.6358***	0.6337***	0.7258***	0.7424***	0.8086***	0.8043***
	(0.0972)	(0.0967)	(0.0725)	(0.0660)	(0.0428)	(0.0433)
m(t-2)	0.0548	0.0534	0.1616***	0.1699***	0.2212***	0.2112***
	(0.0687)	(0.0679)	(0.0476)	(0.0429)	(0.0372)	(0.0350)

Table 4 (continued). Results from equation (11)

	(1)	(2)	(3)	(4)	(5)	(6)
rer	exogenous	predetermined	predetermined	endogenous	predetermined	endogenous
T_Pref	exogenous	predetermined	endogenous	endogenous	endogenous	endogenous
Partners' preferences as instruments	no	no	no	no	yes	yes
Uruguay						
rer	-0.2768	-0.5281	-0.4437	-0.4090	-0.1288	-0.0657
	(0.3230)	(0.4100)	(0.3144)	(0.3472)	(0.2268)	(0.2907)
T_Pref	-2.6471**	-2.7193**	-4.2816***	-3.8787***	-0.7391	-0.9766*
	(1.0822)	(1.1227)	(1.4924)	(1.2604)	(0.5462)	(0.5481)
Hansen test p-value(+)	0.009	0.010	0.016	0.118	0.054	0.198
AR(2) p-value (++)	0.621	0.619	0.469	0.415	0.180	0.221

Notes: (+) Hansen test for the validity of the set of instruments (Ho: the instruments are jointly valid). (++): Arellano-Bond test for second order serial correlation in first differences (Ho: no autocorrelation). Robust standard errors between parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include time dummies.

a negative and significant coefficient can be interpreted as evidence in favor of trade diversion. As shown in Table 5, this is always the case for Argentina and Uruguay; however the estimated coefficients are lower than for the other two interactions, especially in the case of Uruguay. For Brazil, the estimated coefficient is negative and statistically significant only in half of the cases, at 5% (one case) and 10% (two cases), the point estimates are lower than those obtained for Argentina and Uruguay.

B. The influence of MERCOSUR: some counterfactual exercises

The presence of lags of the dependent variable on the right-hand side of equation (11) means that the coefficient for *T_Pref* measures the short-run effect of a change in preferences. To obtain a clearer and more intuitive picture of which could have been the effect of MERCOSUR we run some counterfactual exercises, under the working assumption that MERCOSUR did not take place.

Tariff preferences among MERCOSUR countries take the form of a percentage of countries' MFN rates. The adoption of this formula means that for any good i, and ignoring for the sake of ease the use of superscript z, the tariff rate on imports from within the MERCOSUR $\left(T_i^{MCS}\right)$ is equal to $T_i^{MCS} = T_i^{MFN}\left(1 - Pref_i\right)$. The TA established the timetable for the gradual increase of these preferences. During the convergence period (1991-1994), and to avoid that changes in MFN rates would result in higher T_i^{MCS} rates, Article 4 of the TA established that when MFN rates were increased, the percentage preference would be calculated with reference to the MFN rate in force by January 1, 1991, such that for any good i imported from within the MERCOSUR the tariff rates was given by $T_{i,t}^{MCS} = \min\left\{T_{i,t}^{MFN}\left(1 - Pref_{i,t}\right), T_{i,1991}^{MFN}\left(1 - Pref_{i,t}\right)\right\}$ for $t \leq 1994$. Thus, if we measure the advantage granted by tariff preferences as the percentage points difference between MFN and intra-MERCOSUR rates, $\left(T_i^{MFN} - T_i^{MCS}\right)$, the way T_i^{MCS} is calculated means that a rise in $Pref_i$ will not necessarily result in an increase in the advantage of access granted to other MERCOSUR partners if T_i^{MFN} is simultaneously reduced.

Since there is no adequate way to know with certainty what policies MERCOSUR countries would have followed if MERCOSUR did not exist, we simulate three counterfactual scenarios. In the first scenario we assume countries maintained their original T_i^{MFN} and T_i^{MCS} rates unchanged to their pre-MERCOSUR levels. In the second scenario countries followed the same policies as they did with regard to MFN rates, while keeping at the same levels the percentage preferences ($Pref_i$) granted to the other three countries. Finally, we assume countries kept their original

Table 5. Results from equation (11)

	(1)	(2)	(3)	(4)	(5)	(6)
rer	exogenous	predetermined	predetermined	endogenous	predetermined	endogenous
T_Pref	exogenous	predetermined	endogenous	endogenous	endogenous	endogenous
Partners' preferences as instruments	no	no	no	no	yes	yes
Argentina						
m(t-1)	0.6924***	0.6880***	0.6988***	0.7167***	0.6872***	0.7080***
	(0.0623)	(0.0614)	(0.0496)	(0.0417)	(0.0464)	(0.0414)
m(t-2)	0.1218*	0.1260**	0.1745***	0.2162***	0.1683***	0.2041***
	(0.0653)	(0.0638)	(0.0583)	(0.0493)	(0.0560)	(0.0488)
rer	-2.7253***	-0.9221	-0.6566	-0.7513	-0.7189	-0.7217
	(1.0345)	(0.8422)	(0.6907)	(0.7596)	(0.7026)	(0.8038)
T_Pref * dg_1	-2.7247***	-2.6574***	-3.5880***	-2.3162**	-3.3393***	-2.2458**
	(0.8596)	(0.9621)	(0.9939)	(0.9800)	(0.9390)	(0.9164)
T_Pref * dg_2	-3.8700**	-3.9285**	-3.6791**	-2.1200**	-3.6324***	-2.2254**
	(1.5171)	(1.6533)	(1.4341)	(0.9779)	(1.3731)	(0.9356)
T_Pref * dg_3	-1.7709***	-1.8826***	-2.4542***	-1.6894**	-2.1453***	-1.5495***
	(0.5108)	(0.6026)	(0.6820)	(0.6571)	(0.5352)	(0.4651)
Hansen test p-value(+)	0.056	0.048	0.618	0.395	0.663	0.447
AR(2) p-value (++)	0.785	0.786	0.847	0.567	0.870	0.632

Table 5 (continued). Results from equation (11)

	(1)	(2)	(3)	(4)	(5)	(6)
rer	exogenous	predetermined	predetermined	endogenous	predetermined	endogenous
T_Pref	exogenous	predetermined	endogenous	endogenous	endogenous	endogenous
Partners' preferences as instruments	no	no	no	no	yes	yes
Brazil						
m(t-1)	0.6652***	0.6655***	0.6584***	0.6631***	0.6603***	0.6633***
	(0.0609)	(0.0599)	(0.0583)	(0.0514)	(0.0563)	(0.0510)
m(t-2)	0.0942*	0.0947*	0.1451***	0.1553***	0.1438***	0.1542***
	(0.0487)	(0.0487)	(0.0467)	(0.0499)	(0.0474)	(0.0501)
rer	0.3703	0.0514	0.2122	0.8630	0.2104	0.8597
	(0.8935)	(0.8006)	(0.8538)	(0.8274)	(0.8497)	(0.8333)
T_Pref * dg_1	-3.4587***	-3.6712***	-4.1537***	-4.2927***	-3.7187***	-3.9091***
	(1.2640)	(1.3812)	(0.9375)	(0.9444)	(0.9748)	(0.9400)
T_Pref * dg_2	-7.0596**	-7.4342**	-9.3891***	-8.4458***	-8.7845***	-7.9714***
	(2.9542)	(3.1399)	(2.3125)	(1.9048)	(2.3936)	(2.0258)
T_Pref * dg_3	-0.3771	-0.5210	-1.3220*	-1.5682**	-0.9844	-1.2398*
	(0.7512)	(0.8372)	(0.7667)	(0.7908)	(0.6408)	(0.6413)
Hansen test p-value(+)	0.114	0.116	0.107	0.150	0.126	0.184
AR(2) p-value (++)	0.463	0.463	0.698	0.755	0.692	0.750

Table 5 (continued). Results from equation (11)

	(1)	(2)	(3)	(4)	(5)	(6)
rer	exogenous	predetermined	predetermined	endogenous	predetermined	endogenous
T_Pref	exogenous	predetermined	endogenous	endogenous	endogenous	endogenous
Partners' preferences as instruments	no	no	no	no	yes	yes
Paraguay						
m(t-1)	0.5416***	0.5459***	0.6336***	0.5961***	0.6381***	0.6009***
	(0.0846)	(0.0879)	(0.0585)	(0.0482)	(0.0579)	(0.0475)
m(t-2)	-0.0223	0.0027	0.1890*	0.1113	0.2010*	0.1241
	(0.2272)	(0.2388)	(0.1133)	(0.0910)	(0.1120)	(0.0864)
m(t-3)	0.4413	0.3931	0.1376	0.2040	0.1392	0.2146*
	(0.3968)	(0.4143)	(0.1633)	(0.1257)	(0.1583)	(0.1170)
rer	-0.4848	-0.5156	-0.3400	-0.4208	-0.2419	-0.3630
	(0.5879)	(0.5357)	(0.4747)	(0.4523)	(0.4444)	(0.4231)
T_Pref * dg_1	-1.2287	-1.1932	8.9105	2.6321	1.9512	1.5936
	(1.0145)	(1.0194)	(12.3637)	(10.7238)	(8.5534)	(7.3219)
T_Pref * dg_2	-1.0718	-1.4192	-1.1541	-1.9355	-0.8828	-1.1102
	(2.5430)	(2.6049)	(1.6888)	(1.6363)	(1.0001)	(1.0122)
T_Pref * dg_3	-0.6011	-0.5593	-0.7677	-0.8548	-0.6510	-0.3611
	(0.5037)	(0.5271)	(1.0628)	(1.0977)	(0.5522)	(0.6555)
Hansen test p-value(+)	0.029	0.024	0.497	0.494	0.546	0.567
AR(2) p-value (++)	0.471	0.557	0.983	0.601	0.952	0.600

Table 5 (continued). Results from equation (11)

	(1)	(2)	(3)	(4)	(5)	(6)
rer	exogenous	predetermined	predetermined	endogenous	predetermined	endogenous
T_Pref	exogenous	predetermined	endogenous	endogenous	endogenous	endogenous
Partners' preferences as instruments	no	no	no	no	yes	yes
Uruguay						
m(t-1)	0.6072***	0.6040***	0.7060***	0.7221***	0.7569***	0.7551***
	(0.0935)	(0.0923)	(0.0499)	(0.0454)	(0.0397)	(0.0397)
m(t-2)	0.0361	0.0339	0.1352***	0.1576***	0.1670***	0.1784***
	(0.0639)	(0.0630)	(0.0405)	(0.0399)	(0.0398)	(0.0380)
rer	-0.5279	-0.9431*	-0.3628	-0.3493	-0.1739	-0.2058
	(0.3619)	(0.4934)	(0.2729)	(0.3115)	(0.2321)	(0.2900)
T_Pref * dg_1	-5.4340*	-5.5523*	4.3378	3.1379	8.2428**	6.1972*
	(2.9518)	(2.9781)	(7.2577)	(6.6255)	(4.1574)	(3.7035)
T_Pref * dg_2	-6.1257***	-6.4096***	-5.4869***	-4.3248***	-2.4877**	-2.1323**
	(2.1936)	(2.2557)	(1.5193)	(1.3738)	(0.9929)	(0.9585)
T_Pref * dg_3	-2.2644**	-2.3325**	-3.8683***	-3.1624***	-1.7015***	-1.5902***
	(0.9437)	(0.9672)	(1.0490)	(0.9104)	(0.5167)	(0.4894)
Hansen test p-value(+)	0.024	0.032	0.614	0.764	0.673	0.809
AR(2) p-value (++)	0.495	0.490	0.684	0.493	0.467	0.377

Notes: (+) Hansen test for the validity of the set of instruments (Ho: the instruments are jointly valid). (++): Arellano-Bond test for second order serial correlation in first differences (Ho: no autocorrelation). Robust standard errors between parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include time dummies.

MFN rates unchanged but adopted the observed changes of $Pref_i$. Data availability means that pre-MERCOSUR levels are 1992 for Argentina, and 1991 for the other three countries.

Table 6 shows the changes in the average preference, measured as $\left(T_i^{MFN} - T_i^{MCS}\right)$, under the three scenarios, as well as the observed changes between the beginning of MERCOSUR and the year 2004. As reported in the first column, average preferences granted by Argentina and Brazil were actually lower in 2004 than they were at the beginning of the integration process; the opposite happened in the cases of preferences granted by Paraguay and Uruguay. This difference in the evolution of average preferences is explained by the higher MFN rates that were in place in Argentina and Brazil at the beginning of MERCOSUR. Under scenario 1 we obtain

Table 6. Average preferences: percentage point changes from beginning of MERCOSUR to 2004*

	Observed	Scenario 1	Scenario 2	Scenario 3
Argentina				
All goods	-1.9	0.0	-6.0	6.4
Group 1	-0.4	0.0	-5.0	7.3
Group 2	-0.4	0.0	-5.3	6.8
Group 3	-2.5	0.0	-6.3	6.2
Brazil				
All goods	-2.8	0.0	-8.0	11.6
Group 1	-1.1	0.0	-7.0	11.3
Group 2	-0.2	0.0	-4.4	7.5
Group 3	-3.5	0.0	-8.8	12.3
Paraguay				
All goods	7.0	0.0	-0.1	7.6
Group 1	10.4	0.0	0.9	8.1
Group 2	7.5	0.0	0.3	7.8
Group 3	6.8	0.0	-0.3	7.5
Uruguay				
All goods	3.7	0.0	-3.9	14.4
Group 1	9.3	0.0	-1.8	19.5
Group 2	3.5	0.0	-3.6	14.7
Group 3	3.7	0.0	-4.0	14.1

Notes: Scenario 1: countries kept their MFN and intra-MERCOSUR rates unchanged. Scenario 2: MFN rates followed the observed behaviour, whilst intra-MERCOSUR preferences (% of MFN rates) did not change. Scenario 3: Intra-MERCOSUR preferences (% of MFN rates) followed the observed behaviour, whilst MFN rates did not change. * Argentina: 1992 Brazil, Paraguay and Uruguay: 1991. Source: own calculations based on MERCOSUR and LAIA.

the obvious result of no change in preferences, since we assume that both T_i^{MFN} and T_i^{MCS} remained unchanged. Scenario 2 is the least discriminatory against imports from the ROW, the four countries (especially Argentina and Brazil) would have granted lower preference in 2004 than they did at the beginning of the period. On the other hand, scenario 3 is the more protective of the regional market; in this case the four countries (especially Uruguay and Brazil) would have granted much larger preferences in 2004 than they did in the early nineties. An interesting result is that average preferences granted by Paraguay under scenario 3 are very similar to those actually observed; this finding means that from a comparative perspective, Paraguay has granted a higher protection to its partners' exports than the other three countries did.

Using the share of MERCOSUR into each country total imports as a measure of how deep the integration process has advanced, Table 7 shows that not surprisingly the importance of MERCOSUR as a source of imports is much larger for the smallest members (Paraguay and Uruguay) than for the largest member (Brazil); Argentina is somewhat in the middle. Moreover, this share is larger for goods included into groups 1 and 2, than for goods included into group 3 (where the potential for trade diversion is stronger). This difference is much clearer in the case of Brazil, where the significance of MERCOSUR in total imports of Group 3 goods is 60% of the overall importance of MERCOSUR in the country's total imports (6.5% for Group 3 goods compared with 11.2% for all goods). On the other hand, the figures for the share of Group 3 goods for the other three countries are at least as high as 80% of the share of total imports.

The difference between observed shares and those obtained under the three alternative scenarios hints as to what could have been the effect of MERCOSUR.[12] Despite the fact that it is almost impossible to know what path preferences and

Table 7. Intra-MERCOSUR share in countries' total imports: 2001-2004

Good group	Argentina	Brazil	Paraguay	Uruguay
1	56.0	20.9	70.1	86.3
2	48.5	26.9	63.6	68.4
3	28.6	6.5	44.4	41.3
Total	34.9	11.2	52.6	51.1

Source: own calculations based on LAIA.

[12] Since under our no-MERCOSUR scenarios the only variables we can control for are MFN and preferences rates, our simulations should be understood as a partial equilibrium exercise.

MFN rates would have followed if the agreement had not existed, the worldwide tendency toward the reduction of tariff barriers that occurred during the nineties, and considering that one would be hard-pressed to think of countries following a policy increasing preferences as much as they did under the MERCOSUR, we may argue that our scenario 2 could be taken as a good approximation, so we concentrate our analysis on this scenario. The outcomes for the other two scenarios are also reported.

As Table 8 shows, in the cases of Argentina, Brazil and Uruguay, the existence of MERCOSUR meant an overall increase in the share of imports with origin within the boundaries of the regional agreement relatively to what would have been if MERCOSUR had not existed. Still, there are significant differences in the effects across the three countries: the increase for Brazil is about half the size the ones for Argentina and Uruguay, but it represents a higher percentage change relative to the actual figures. More importantly, the differential effects across the three countries are amplified in the case of potentially trade diverting sectors (Group 3): for Brazil MERCOSUR meant an increase of just 1.7 percentage points, for Argentina the figure is 10 points, while for Uruguay is even higher at 24.7 points. In this case,

Table 8. Intra-MERCOSUR import shares during 2001-2004: percentage point changes due to the existence of MERCOSUR [a]

Scenario	Good group	Argentina	Brazil	Paraguay	Uruguay
1	1	-9.1	6.1	-16.5	-12.6
	2	5.8	-30.3	-6.5	-11.5
	3	5.9	0.6	-1.1	14.4
	Total	5.2	-7.3	-4.7	-7.1
2	1	8.3	14.7	-16.1	-12.6
	2	15.2	18.3	-6.4	17.7
	3	10.0	1.7	-1.1	24.7
	Total	11.8	5.9	-4.6	13.3
3	1	-20.0	-51.7	-2.6	25.9
	2	-12.9	-64.0	-10.1	-29.7
	3	-5.6	-2.8	-4.0	-29.8
	Total	-9.7	-50.0	-8.1	-42.0

Notes: Scenario 1: countries kept their MFN and intra-MERCOSUR rates unchanged. Scenario 2: MFN rates followed the observed behaviour, whilst intra-MERCOSUR preferences (% of MFN rates) did not change. Scenario 3: Intra-MERCOSUR preferences (% of MFN rates) followed the observed behaviour, whilst MFN rates did not change. [a] Observed share minus predicted share. Predicted shares are obtained using results from Table 5: column 6 for Argentina, Brazil and Paraguay, and column 3 for Uruguay.
Source: own calculations.

the change relative to the actual figures is also lower for Brazil than for Argentina and Uruguay. The opposite outcome happens for goods included intro Groups 1 and 2, where the effect of MERCOSUR has been more important in the case of Brazil, either in absolute or relative terms. In the case of Uruguay, MERCOSUR had a negative impact on imports from within the block.

It is important to note that our results show that for Paraguay the overall importance of intra-MERCOSUR imports would have been higher without the integration process. The same result emerges when considering separately the three groups of goods, particularly in the case of Group 1 goods where the existence of MERCOSUR meant a reduction of 16.1 percentage points with respect to the predicted figure if MERCOSUR had not existed. In the case of potentially trade diverting sectors (Group 3), the share of imports with origin in other members of the agreement is very similar to the actual observed value.

As mentioned before, the way we measure the numerator of our dependent variable, where for each country we bundle together all imports from MERCOSUR partners, means their values may be strongly influenced by imports from the largest partner inside MERCOSUR. During the period between 1992 and 2004, imports from Brazil explained 90% of Argentina's intra-MERCOSUR imports. In the case of Brazil the main source of intra-MERCOSUR imports is Argentina with 84% of total imports from MERCOSUR partners. On the contrary, for Paraguay and Uruguay the importance of Argentina and Brazil as a source of imports are relatively similar, 39% and 56% for Paraguay, and 50% and 49% in the case of Uruguay. Due to this asymmetry in the source of imports for the two largest MERCOSUR partners, we estimate equation (11) for Argentina and Brazil, but in each case without considering imports from each other. Table 9 reports the estimated changes in the shares of Argentina and Brazil imports from Paraguay and Uruguay as a percentage of each country total imports (excluding imports from each other).[13] Even when MERCOSUR has meant an increase in imports from within the agreement, not surprisingly, the fact that MERCOSUR has existed played just a small role in the import patterns of Argentina and Brazil from the two smallest members of the agreement. However, we need to look at this finding from the right perspective, since when we take into account that Paraguay and Uruguay represent both a small proportion of Argentina and Brazil's imports, the changes reported in Table 9 are not necessarily negligible.

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[13] Due to space reasons, we do not report here the econometric results. These are available from the authors upon request.

Table 9. Intra-MERCOSUR import shares during 2001-2004: percentage point changes due to the existence of MERCOSUR when trade with Argentina and Brazil is excluded [a]

Scenario	Good group	Argentina	Brazil
1	1	1.0	0.7
	2	0.8	0.3
	3	1.2	0.7
	Total	1.1	0.7
2	1	1.5	0.7
	2	1.0	0.4
	3	1.5	1.0
	Total	1.5	0.9
3	1	-0.7	0.2
	2	0.2	0.1
	3	0.1	-0.2
	Total	-0.1	-0.1

Notes: Scenario 1: countries kept their MFN and intra-MERCOSUR rates unchanged. Scenario 2: MFN rates followed the observed behaviour, whilst intra-MERCOSUR preferences (% of MFN rates) did not change. Scenario 3: Intra-MERCOSUR preferences (% of MFN rates) followed the observed behaviour, whilst MFN rates did not change. [a] Observed share minus predicted share. Source: own calculations.

The results just presented are in line with the argument suggested by Venables (2003, 2005). Venables argues that for countries involved in Regional Integration Agreements, those with more extreme comparative advantages are the most likely to pay the costs of trade diversion. Then, it is not a surprise that in the case of Brazil, a large and diversified economy, we did not find evidence of trade diversion. On the other extreme, we may have expected Paraguay and Uruguay to be the countries most negatively affected. However, as our results show, this is not the case for Paraguay. Two concurrent elements may help to explain this outcome. First, partly due to its geographical location, nearly 90% of its international boundary is shared with Brazil and Argentina, imports coming from other MERCOSUR members already represented at the beginning of the integration process a very high proportion of the country's total imports, especially those of manufactures. Second, footloose activities such as manufactures represent a relatively small proportion of Paraguay's GDP such that there was not much scope for location effects to take place. For the case of Argentina, two elements may help to explain, at least to some extent, the results here obtained. On the one hand, Argentina, like Uruguay, is a country with strong comparative advantages in the production of agricultural commodities and manufactures that use intensively

these commodities. On the other hand, some industrial sectors that emerged as a result of the protection provided by a long-lasting policy of import substitution were not in condition to compete with Brazil's manufactures once intra-MERCOSUR tariffs were eliminated. Additionally, the larger Brazilian domestic market may have acted as a centripetal force, with Argentinean producers moving part of their production to Brazil.[14]

Finally, another plausible explanation for our results can be found on the endogenous trade policy literature. As suggested by Grossman and Helpman (1995) and later confirmed by Olarreaga and Soloaga (1998), temporary deviations from internal free trade as allowed by the TA and later by the ARM were biased toward trade creating sectors. Out of the MERCOSUR countries, Brazil was the less reliant on this policy, therefore, it might have maximized the benefits of potential trade creation, relative to the other three countries. Another reason, suggested by Cadot, de Melo and Olarreaga (1999), and also shown in Olarreaga and Soloaga (1998), is that the design of MERCOSUR's common external tariff is heavily affected by the interests of Brazilian producers, such that most trade diversion would likely benefit this country.

V. Summary and conclusions

The costs of trade diversion could be unequally distributed across members of a Regional Integration Agreement. In particular, in agreements between developing countries (South-South agreements), the poorest countries (or rather the least capital abundant, which is probably more relevant for the case of MERCOSUR) are the ones that bear the costs of trade diversion. This paper gives evidence in the direction that MERCOSUR could be an example of a South-South agreement with an uneven distribution of the costs of trade diversion.

As MERCOSUR deepened further, intra-zone trade increased its share in total trade; this behavior acquires more relevance if we take into account that during the same period both total exports and imports increased substantially. In most cases,

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[14] In this case, the increase in the weight of intra-MERCOSUR imports *vis-à-vis* imports from the ROW would be explained by the predictions of the New Economic Geography, which show that for positive but not prohibitive trade costs, the larger region has a more than proportional share of the production of goods exhibiting IRS (i.e. manufactures), being a net exporter of these goods and a net importer of goods produced under CRS (Venables 2003). However, in this case, the increase in the ratio of imports from within the block to imports from the ROW is not mainly because of changes in the origin of imports, but because of the substitution of local production with imports originated in other countries of the agreement.

increasing intra-zone trade has meant an increase in the share of goods where MERCOSUR members did not have a revealed comparative advantage at the beginning of the integration process.

In order to measure to what extent the reduction of intra-zone barriers under the MERCOSUR affected the import patterns of its members, we derived an equation based on Krugman's model of monopolistic competition for international trade. The results show that tariff preferences had a significant effect on the import patterns of Argentina and Uruguay, and to a less extent in the case of Brazil. For Paraguay, we found no significant effect. Also, for Argentina and Uruguay the results support the hypothesis that MERCOSUR has produced a diversion of trade, while no such outcome arises for the other two partners.

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