The University of Nottingham

research paper series

Theory and Methods

Research Paper 2007/27

MERCOSUR's role on the regional patterns of imports of its country members: a dynamic panel data approach

by

Pedro E. Moncarz and Marcel Vaillant

The Centre acknowledges financial support from The Leverhulme Trust under Programme Grant F114/BF

GEP Leverhulme Centre for Research on Globalisation and Economic Policy

The Authors

Pedro Moncarz is Professor of Economics at the National University of Cordoba (Argentina).

Marcel Vaillant is Professor of International Trade at University of the Republic (Uruguay).

Acknowledgements

We thank Marcelo Olarreaga for his comments and careful reading of a previous version of this paper. We also appreciate the comments of the participants at the 7th Arnoldsheim Seminar (Vienna University of Economics and Business Administration), Fall 2006 Midwest International Trade Conference (Purdue University), and seminars at the School of Economics (University of Nottingham) and Departamento de Economía (Universidad de la República). The usual disclaimer applies. Pedro Moncarz is grateful to The Leverhulme Trust for financial support under Programme Grant F114/BF. Financial support from the EULALIA Red under the ALFA II Programme of the European Union (contract N° AML/B7-311-97/0666/II-0058-FA) is also acknowledged.

MERCOSUR's role on the regional patterns of imports of its country members: a dynamic panel data approach

by

Pedro E. Moncarz and Marcel Vaillant*

Abstract

With the signature of the Asuncion Treaty by Argentina, Brazil, Paraguay and Uruguay in July 1991, the four countries implemented an ambitious program to reduce tariffs and non-tariff barriers on their reciprocal trade; a common policy toward third countries was implemented in 1995. As MERCOSUR deepened further, intra-zone trade increased its share in total trade. In most cases, increasing intra-zone trade meant an increasing participation of goods where MERCOSUR members did not have a RCA at the beginning of the integration process. Starting from Krugman (1980) monopolistic competitive model for international trade we derive an equation to explain regional patterns of imports. Making use of a recently detailed database on intra-MERCOSUR tariffs we estimate the effect of tariff preferences on the origin of imports of MERCOSUR members between 1991 and 2004. The results show tariff preferences affected imports patterns in the cases of Argentina and Uruguay, and to a less extent also those of Brazil and Paraguay. For the first two countries the results appear to sustain the hypothesis MERCOSUR may have induced a trade diversion effect, from which Brazil would have been the most benefited member.

JEL classification: F12, F13, F15

Keywords: regional integration, tariff preferences, trade patterns, monopolistic competition.

Outline

* Corresponding author: Pedro E. Moncarz, Facultad de Ciencias Económicas, Universidad Nacional de Córdoba, Av. Valparaíso s/n. Ciudad Universitaria, CP 5000. Córdoba (Argentina). e-mail: pedro.moncarz@gmail.com. Marcel Vaillant, Universidad de la República, José Enrique Rodó 1854, Montevideo, Uruguay, e-mail: marcel@decon.edu.uy.

Non-Technical Summary

In July 1991, Argentina, Brazil, Paraguay and Uruguay signed the Asuncion Treaty giving birth to the MERCOSUR. Under the MERCOSUR, the four countries implemented an automatic, and relatively fast, reduction of tariffs and non-tariff barriers within the zone. In 1995 a common external tariff policy on imports from third countries was adopted. In both cases, intra- and extra-zone trade barriers, countries have still some degree of freedom to implement their own policies, however this is quite limited. The homogenization of tariff barriers has gone much further than that of non-tariff barriers.

As MERCOSUR deepened further, intra-zone trade increased its share in total trade; this behaviour acquires more relevance if we take into account that during the same period both total exports and imports increased substantially. In most cases, increasing intra-zone trade meant an increasing participation of goods where MERCOSUR members did not have a revealed comparative advantage at the beginning of the integration process. In the case of exports to the ROW, the share of these kinds of good increased at a faster rate than intra-MERCOSUR exports. The opposite happened in the case of imports. When looking at the importance of these sectors across the four countries, there is not much difference in the case of imports from the ROW, while for intra-MERCOSUR imports the importance of these sectors is larger in the cases of Uruguay, Argentina and Paraguay, than for Brazil.

In order to measure to what extent the reduction of intra-zone barriers under the MERCOSUR affected the import patterns of its members, we derive in Section 3 an equation based on Krugman's monopolistic competitive model for international trade to explain, for a given country *z*, the ratio of imports of good *i* from any two countries *j* and *h*. The results from the empirical model in section 4 show that tariff preferences granted under the MERCOSUR had a significant effect on the import patterns of Argentina and Uruguay, and to a less extent in the cases of Brazil and Paraguay. Also, in the cases of Argentina and Uruguay, the results appears to sustain the hypothesis that the MERCOSUR may have induced a trade diversion effect, while no such effect arises for the other two countries.

1. Introduction

There exist an extensive empirical literature on the effects of regional integration on the patterns of trade and specialisation of countries engaged in such processes. A widely used approach involves estimating a "gravity equation" with trade between members of a regional agreement being identified by a dummy variable. Then, the magnitude and statistical significance of the dummy variable is a measure of the importance of the agreement under analysis. Previous empirical applications for the case of MERCOSUR have found a statistically significant effect (i.e. Frankel, 1997, and more recently Mayer and Zignago, 2004).

The possibility of distinguishing among different forces explaining the increase in the intensity of intra-regional trade, such as geographical factors, trade complementary, etc., versus those related to the evolution of tariff preferences is highly restricted by the availability of suitable data. The aim of the present paper, using a theoretical framework based on Dixit and Stiglitz (1977) and Krugman (1980) is to analyse 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 our case we make use of a recently developed database of intra-MERCOSUR tariff rates which is available at a great level of detail (MERCOSUR Secretariat, 2005).

The paper is composed of this introduction and four more sections. The second section presents a brief summary of the evolution of MERCOSUR's trade policy and trade patterns. In the first case we distinguish between the two phases of MERCOSUR, 1991-1994 when the agreement responded to the characteristics of a free-trade zone, and 1995-2004 when the four members adopted also a common trade policy toward third countries. The third section deals with theoretical and methodological issues. Based on Krugman (1980) model, later adapted by Mayer y Zignago (2004), we derive an estimable equation to explain the changes in the regional origin of imports. Section four presents and analyses the econometric results from the estimated equation. The last section summarises the main findings.

2. Trade Policy and Patterns of Trade

2.1. Trade Policy under the MERCOSUR: a brief summary[1]

Since its conception, with the signature of the Treaty of Asunción (TA[2]), the aim of the MERCOSUR was to set up a custom union. In the case of MERCOSUR, we can identify two phases. In a first phase, 1991-1994, the agreement responded to the characteristics of a free-trade zone, when each country retained the power to set its own trade policy with respect to non-members. The second phase started in 1995, when the four members adopted also a common trade policy toward third countries.

2.1.1. Period 1991-1994

The signature of the TA in 1991 constitutes the cornerstone which gave birth to the MERCOSUR. As just said, the main aim of the TA was to establish a common market including Argentina, Brazil, Paraguay and Uruguay. The TA established the timetable for the increase of tariff preferences among MERCOSUR's members, specific timetables were agreed for those goods already covered by previous preferential agreements, in any case, at the moment of the MERCOSUR being launched in July 1991, the minimum tariff preference was 47%, with December 1994 as the deadline to achieve a 100% tariff preference. In order to attend the particular situation of some sectors, an exemption regime was agreed. Finally, a sector left aside from the MERCOSUR agreements was the automotive industry, sector that was regulated by bilateral agreements[3].

2.1.2. Period 1995-2004

Intra-MERCOSUR trade

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 barriers; however this was not the case. In 1994, a new timetable was agreed for a limited number of goods, this

[1] Others aspects of the integration process, such as Rules of Origin and Safeguard clauses are not included into this brief summary.
[2] Latin American Integration Association's (LAIA) Partial Economic Complementation Agreement (ACE) Nº 18.
[3] The corresponding agreements are ACE-14 for Argentina-Brazil, ACE-1 and ACE-57 for Argentina-Uruguay, and ACE-2 for Brazil-Uruguay.

regime was known as RAM[4]. The RAM constituted a reissue of the exemption lists that were in force between 1991 and 1994. The RAM allowed each member to select a number of goods to be temporarily exempted from the requisite of 0% intra-zone tariff. By the beginning of the current decade all imports reached by MERCOSUR agreements were subject to a 0% tariff.[5] Like during the period 1991-1994, the automotive industry was left aside, being still subject to bilateral agreements. In general, the main guidelines ruling the sector are: (i) free trade but subject to a requisite of minimum content of local/regional production; (ii) limits to the possibility of unbalanced trade flows (this requirement has became more flexible over time, and it should not be in force after 2006)[6]; (iii) in some cases, when the requirement of local/regional production is not met or the minimum requirement is reduced, quota restrictions become applicable. Finally, another sector not reached by the MERCOSUR is the sugar industry[7]. Originally, the sector was supposed to be included into the MERCOSUR framework by December the 31st of 2000[8], this deadline was later postponed to the end of 2005, it has yet not been incorporated within the MERCOSUR framework.

Extra-MERCOSUR trade

In line with the objective of establishing a Common Market, in 1995 MERCOSUR members agreed on a common external policy through the implementation of a Common External Tariff (CET) to be applied on imports originated outside the MERCOSUR.

The CET has a structure with 11 levels, with tariffs in the range 0%-20%. The general principle is that tariffs increases with the share of value added of the goods subject to the tariff. Others 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[9]. Some goods were exempted from the increase. Additionally, each country kept

[4] See Decision 5/94, Common Market Council (CMC), Régimen de Adecuación al MERCOSUR (Adaptation Regime to the MERCOSUR).
[5] See decision by the MERCOSUR's ad hoc tribunal (TAHM) of 28/04/1999, communiqués 37/1997 and 7/1998 of the Trade Operations Department (DECEX) of the Trade Secretariat (SECEX): application of restrictive measures on reciprocal trade, issue 1/99, MERCOSUR's Official Bulletin 9/1999 (page 227).
[6] Recently Argentina and Brazil agreed on a temporary new regime which still includes limits to trade unbalance.
[7] According to the MERCOSUR customs nomenclature, the sugar sector includes the items 1701.11.00, 1701.12.00, 1701.91.00, y 1701.99.00.
[8] See Decisions 07/94, 19/94 y 16/96 by the CMC.
[9] CMC's Decision 15/97

the right to choose the goods subject to the increase. Subsequently, in 2000, 2001 and 2002 the increase in the CET was partially reversed[10]. In 2004 the CET returned to its 1998 level. The general policy with respect to the CET is directed to its gradual reduction. Like in the case of intra-MERCOSUR trade, there are some exemptions to the CET, five groups of goods can be identified: capital goods; telecommunication and informatics; sugar; automotive; and countries' lists.

2.2. 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[11] (RCA). The RCA indices are calculated at 4 digits of the Harmonised System using data for the year 1995. According to the pattern of the RCA index for each member of MERCOSUR, 16 groups of sectors were identified:

i) 4 groups where $RCA_i>1$ for only one member of MERCOSUR (A, B, P, U);
ii) 6 groups where $RCA_i>1$ for two members of MERCOSUR (AB, AP, AU, BP, BU, PU);
iii) 4 groups where $RCA_i>1$ for three members of MERCOSUR (ABP, ABU, APU, BPU);
iv) 1 group where $RCA_i>1$ for the four members of MERCOSUR (ABPU);
v) 1 group where $RCA_i>1$ for none of the members of MERCOSUR (NONE).

Before looking at the results let us point out a few points about the use of RCA indices. By definition, RCA indices are calculated on actual trade flows, which are necessarily affected by each country trade policy, as well as by those of other countries. On the other hand, the concept of what we can call "natural comparative advantages" makes reference to the patterns of trade that would arise if trade distortions did not existed, in this case trade patterns are determined, among other reasons, by differences in technologies and factor endowments. To classify sectors according to the comparative advantages of each country would require a model explaining the patterns of trade in a non distorted economy. Besides the difficulties of having this kind of models, when they are available the level of aggregation allows just distinguishing among a small number of

[10] CMC's Decisions 67/00, 06/01 y 21/02.

[11] The RCA index for sector *i* in country *j* is defined as $RCA_i^j = \frac{X_i^j \Big/ \sum_i X_i^j}{X_i^W \Big/ \sum_i X_i^W}$, where *X* stands for exports, while the superscript W make reference to world values.

sectors. Because of this, we need to rely on a classification based on RCA indices. In the particular case at hand, our interest is to look at the evolution of trade patterns within the MERCOSUR *vis a vis* trade with the ROW[12], and compare them with those existing at the beginning of the integration process. However, due to problems about how countries record their trade statistics, RCA indices are calculated using trade flows for the year 1995, the earliest year for which we have homogeneous data for the whole world and the four MERCOSUR's members[13]. To obtain a better perspective about how trade patterns changed since the beginning of MERCOSUR, it would have been more appropriate to use data before MERCOSUR, without this implying trade patterns previous to MERCOSUR were an accurate reflection of the comparative advantages of each of its members, especially if we take into account the high level of protections prevailing at that time.

The main picture emerging from the data is that the patterns of trade specialisation are coherently related with the patterns of the RCA index. It is in the last group, the one where none of the MERCOSUR members have a RCA, where we can observe an import specialization, while the group where the four countries have a RCA shows an export specialization, mainly to extra-MERCOSUR countries.

Table 1 presents the structure of trade with the ROW for the period 1993-2004 according to the 16 groups above identified. In this case, and not surprisingly, most exports were explained by those sectors each country had in 1995 a RCA, while most of their imports corresponded to sectors other MERCOSUR countries did not have a RCA.

An important effect of any preferential agreement is that it favours trade between members of the agreement relative to trade with non-members countries. Table 2 presents the structure of intra-MERCOSUR trade according to the typology emerging for the countries' RCA indices. A notable result is that the group where none of the members had a RCA explains an important share of intra-zone imports, Uruguay 43.4%, Paraguay 42.8%, Argentina 40.7% and Brazil 29.5%. In all cases this group is the most important. With respect to intra-zone exports, goods included into the group for which none of the members had a RCA explain a large proportion in the cases of Argentina (32.5%) and Brazil (39.4%). If we consider altogether sectors Brazil had not a RCA, these explain 50.1% of exports to other MERCOSUR countries. In the case of Argentina the percentage of intra-MERCOSUR exports explained by sectors the country did not have a RCA in 1995 is 43.2%, in second place, with only 18%, we have those sectors Argentina is the only country with a RCA. In the cases of Paraguay and Uruguay there is less evidence of the MERCOSUR stimulating what we may refer as an "artificial" competitiveness, with the

[12] The ROW excludes MERCOSUR countries as well as members of the Latin American Integration Association (LAIA).
[13] World exports were provided by CEPII (Centre d'Etudies Prospectives et d'Informations Internationales).

share of exports by sectors the countries did not have a RCA being lower than for the other two countries, especially Paraguay with just 10.2%, while for Uruguay the figure is 30.8%. In the case of Paraguay, most of its intra-zone exports are explained by sectors where Paraguay as well as other members of MERCOSUR had a RCA, 65.8% corresponding to sectors Argentina, Brazil and Paraguay had a RCA. This phenomenon could be explained by the Mediterranean geography of Paraguay, such that extra-MERCOSUR exports need in a first step to be exported to some of the other three members. Finally, in the case of Uruguay, the distribution of intra-zone exports is mostly explained by sectors the country had a RCA in 1995, either alone or simultaneously with Argentina.

The data presented in Tables 1 and 2 refer to the period 1993-2004 as a whole, however, an important aspect to look at is if as integration under the MERCOSUR deepened, the pattern of trade of its members changed with respect to those prevailing at the beginning of the integration process, especially in the case of sectors countries did not have a RCA[14]. As shown in Tables 3.A, the relative importance of exports MERCOSUR countries did not have a RCA in 1995 is in all cases higher in the case of intra-MERCOSUR trade than when looking at trade with the ROW. Not surprisingly, the opposite scenario arises in the case of imports (Table 3.B). An interesting result is that for the four countries exports the countries did not have a RCA increased faster in the case of trade with the ROW than with other MERCOSUR members. This last result might be reflecting a "learning by doing" effect, increasing intra-zone exports of goods the countries did not have a RCA may have allowed also increasing exports of this kind of goods to the ROW. A more careful analysis is required here before drawing more precise conclusions. On the other hand, imports show a more heterogeneous scenario. For Argentina and Brazil, intra-zone imports of goods the other MERCOSUR countries did not have a RCA in 1995 increased faster than imports of similar goods from the ROW, for Paraguay the figures are quite similar, while in the case of Uruguay in both cases we observe a negative growth rate, however this is larger in the case of imports from the ROW, meaning that like for Argentina and Brazil, the other members of MERCOSUR increased their shares in the country's imports of this kind of goods.

[14] Without this implying trade patterns previous to MERCOSUR were an accurate reflection of the comparative advantages of each of its members.

Table 1
Typology of goods (HS 4 digit) by group of MERCOSUR countries with RCA in 1995, 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	12,4%	4,2%	2,9%	9,2%	0,4%	3,8%	0,9%	13,0%
B	2,2%	11,7%	31,4%	9,6%	1,5%	12,2%	1,8%	9,5%
P	0,5%	0,2%	0,3%	0,2%	2,4%	0,1%	3,1%	0,3%
U	1,3%	5,2%	0,8%	3,6%	0,5%	2,4%	8,1%	7,2%
b) Two countries have a RCA								
AB	6,2%	6,9%	10,3%	5,1%	0,1%	8,8%	0,2%	6,1%
AP	10,8%	0,2%	0,4%	0,1%	1,8%	0,1%	0,0%	0,2%
AU	9,4%	0,6%	0,4%	0,9%	0,0%	0,3%	27,5%	0,9%
BP	0,4%	0,3%	5,5%	0,1%	9,4%	0,1%	0,7%	0,1%
BU	0,5%	1,1%	4,6%	0,8%	0,3%	0,8%	2,4%	1,4%
PU	0,0%	0,1%	0,0%	0,0%	0,0%	1,0%	0,0%	0,1%
b) Three countries have a RCA								
ABP	31,8%	0,2%	19,1%	0,8%	64,6%	0,6%	1,1%	0,5%
ABU	2,1%	0,3%	3,4%	0,1%	0,2%	0,1%	13,4%	0,4%
APU	4,3%	0,0%	0,4%	0,2%	2,2%	0,0%	6,0%	0,2%
BPU	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
c) All countries have a RCA								
ABPU	7,9%	0,2%	3,4%	0,2%	14,8%	0,2%	30,8%	0,2%
c) No country has a RCA								
NONE	10,3%	69,0%	16,9%	69,0%	2,0%	69,6%	3,8%	59,9%
The country does not have a RCA	15,2%		22,2%		5,0%		11,7%	
None of the other 3 countries have a RCA		73,2%		78,6%		69,7%		67,1%
Trade 1993-2004 (thousand USD)	160,937,168	172,504,281	516,385,100	492,106,515	4,644,457	12,737,150	13,510,199	17,573,321

Source: own based on LAIA and CEPII.

Table 2
Typology of goods (HS 4 digit) by group of MERCOSUR countries with RCA
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	18,0%	3,5%	4,1%	15,6%	0,3%	7,3%	1,5%	10,1%
B	5,9%	25,7%	26,6%	5,1%	1,5%	19,9%	4,3%	12,2%
P	0,2%	0,3%	0,4%	0,1%	0,9%	0,6%	0,3%	0,6%
U	3,0%	4,8%	4,8%	4,1%	1,9%	8,0%	23,6%	5,8%
b) Two countries have a RCA								
AB	12,8%	14,9%	14,3%	11,6%	0,7%	7,9%	4,9%	9,6%
AP	2,1%	0,2%	0,2%	2,2%	5,0%	0,6%	0,1%	1,5%
AU	8,0%	1,1%	0,8%	11,2%	0,7%	3,0%	31,7%	3,2%
BP	0,2%	2,1%	1,6%	0,4%	6,7%	0,4%	0,0%	1,3%
BU	1,4%	3,0%	3,9%	1,2%	0,2%	4,6%	3,1%	2,3%
PU	0,0%	0,1%	0,4%	0,0%	0,2%	0,5%	0,4%	0,1%
b) Three countries have a RCA								
ABP	2,4%	1,7%	1,4%	6,1%	65,8%	1,9%	0,1%	3,4%
ABU	0,3%	0,7%	0,8%	0,4%	0,2%	0,6%	1,6%	0,7%
APU	10,9%	0,2%	0,0%	10,2%	7,5%	1,4%	6,5%	0,7%
BPU	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
c) All countries have a RCA								
ABPU	2,2%	1,0%	1,4%	2,3%	3,8%	0,6%	2,3%	5,1%
c) No country has a RCA								
NONE	32,5%	40,7%	39,4%	29,5%	4,7%	42,8%	19,5%	43,4%
The country does not have a RCA	43,2%		50,1%		10,2%		30,8%	
None of the other 3 countries have a RCA		44,2%		34,6%		43,4%		49,2%
Trade 1993-2004 (thousand USD)	82,597,074	70,308,168	81,070,233	82,576,166	6,395,793	13,899,833	11,488,382	16,097,411
INTRA-MERCOSUR (% of TOTAL)	28.5%	27.2%	12.3%	13.5%	53.5%	50.6%	42.5%	45.0%

Source: own based on LAIA and CEPII.

Table 3

(A) Exports by destiny: share of exports where the exporter country did not have a RCA in 1995

	ARGENTINA		BRASIL		PARAGUAY		URUGUAY	
	Mercosur	**ROW**	**Mercosur**	**ROW**	**Mercosur**	**ROW**	**Mercosur**	**ROW**
1993	31,7	13,0	48,8	16,3	7,6	1,6	29,0	4,6
1994	28,2	13,4	45,9	14,7	9,6	2,1	30,2	4,1
1995	28,6	8,6	44,1	12,3	2,3	1,1	20,9	4,0
1996	35,8	8,2	45,7	13,2	10,2	2,9	22,1	4,6
1997	42,8	8,4	46,6	13,2	11,7	2,3	23,5	5,7
1998	43,8	12,1	45,2	16,7	11,3	3,7	27,7	7,6
1999	43,6	15,5	50,6	19,0	14,6	6,4	34,5	7,5
2000	43,8	17,7	56,1	26,3	12,8	9,3	40,3	8,3
2001	51,2	18,1	56,0	30,4	13,3	6,6	40,4	8,5
2002	51,4	19,4	53,2	30,7	9,3	9,9	38,2	21,6
2003	53,5	19,6	54,7	28,6	8,3	8,1	33,3	22,7
2004	57,6	19,8	56,3	27,9	11,0	6,4	41,6	25,1
Growth rate (*)	**6,4**	**7,1**	**2,1**	**8,6**	**5,1**	**18,1**	**4,9**	**17,5**

(B) Imports by origin: share of imports where the other three MERCOSUR countries did not have a RCA in 1995

	ARGENTINA		BRASIL		PARAGUAY		URUGUAY	
	Mercosur	**ROW**	**Mercosur**	**ROW**	**Mercosur**	**ROW**	**Mercosur**	**ROW**
1993	41,5	74,9	33,5	75,8	50,2	67,6	59,7	74,5
1994	35,8	75,7	28,4	76,9	46,7	67,2	57,8	77,8
1995	37,7	74,8	30,4	78,4	37,9	66,1	45,1	72,3
1996	38,9	73,2	30,2	76,6	40,4	68,5	45,3	70,3
1997	41,8	71,2	32,6	79,6	39,7	67,7	48,3	70,4
1998	40,2	72,2	34,3	81,0	36,4	69,8	45,2	69,0
1999	43,8	74,2	32,2	82,1	45,8	71,7	51,2	70,7
2000	50,5	74,3	32,8	82,7	47,1	75,8	48,4	64,4
2001	50,0	73,8	40,5	81,5	46,1	75,1	46,8	68,3
2002	46,8	69,5	37,7	78,3	44,4	77,2	47,6	66,1
2003	48,7	70,4	38,6	76,2	46,3	70,1	46,1	52,7
2004	50,8	72,0	44,9	73,2	47,5	67,9	51,0	47,6
Growth rate (*)	**2,9**	**-0,5**	**3,1**	**0,0**	**0,6**	**0,8**	**-1,1**	**-3,3**

(*) Based on the regression: $\ln(Y_t) = a + b.t$

Source: own based on LAIA and CEPII.

3. Theoretical and Methodological aspects

As barriers on international trade between members of a regional agreement are dismantled, we might expect changes in the structure of trade with other members of the agreement *vis a vis* the ROW. In this case, we can expect intra-regional trade having an increasing weight at the expense of trade with countries that are not benefited by a preferential treatment.

Considering that a country's trade performance depends on a wide set of influences, many of which are interdependent, it is not an easy task to try to model the effects of trade integration on the patterns of trade of countries involved in such processes. In what follows, and based on Krugman (1980) monopolistic competition model of international trade, we derive an equation explaining, for a given country *z*, the ratio of imports of good *i* from any two countries *j* and *h*.

3.1. The theory of the preferential liberalization

The classical theory of preferential trade liberalisation is based on the concepts of trade creation and trade diversion. The aim is trying to identify if the reallocation of resources, both in consumption and production, produced by the substitution of suppliers that a discriminatory trade liberalisation produces, increases or reduces the aggregate level of welfare. To be able to determine which of the two effects, trade diversion or trade creation, will prevail it becomes necessary to establish a typology of the protection regimes that will follow after a discriminatory trade liberalisation. With this aim in mind, two aspects need to be taken into account, the relative sizes of the importer and exporter countries, and the efficiency of production of the exporter country relative to that of the rest of the world. Table 1 summarises the different alternatives. The first regime is when the exporter country within the regional agreement (country B) is not large enough to satisfy the demand of the importer country (country A). In this case the exporter country (B) wins since it captures the tariff revenues lost by the importer country (A), while the zone as a whole receives a lower welfare. Country B benefits from the protection granted by country A, increasing its production. Country A benefits when it liberalises its trade with a country B whose producers are efficient enough, and the country is large enough to maintain its own low prices after the agreement takes place, in this case the demand from A is not large enough given the supply by country B. Under these conditions, country B is indifferent, while the zone as a whole receives a larger welfare. In all other cases country B always wins as well as the two countries together, the situation of country A is

ambiguous, depending on the magnitudes of the trade creation and trade diversion effects.

The most frequent case is when the exporter country sells its production in A at the high domestic price prevailing in this country (because of the tariffs on imports from the ROW), while it supplies its own market with cheap imports from the ROW.

Table 1
Welfare effect of a preferential trade policy

	Enhanced protection		Intermediate case		Reduced protection	
Country	B efficient	B non efficient	B efficient	B non efficient	B efficient	B non efficient
A	-	-	+ / -	+ / -	+	+ / -
B	+	+	+	+	0	+
Zone	-	-	+	+	+	+

In order to evaluate the welfare effects of any given agreement it is necessary to look at the markets where the members of the agreement show an import or export regional specialisation. The model developed below assumes product differentiation *à la* Dixit-Stiglitz. Under this framework it is necessary to adapt the concepts of trade diversion and trade creation as originally proposed by Viner (1950) for the case of homogeneous goods in a model with 3 countries and 2 goods. There are many potential cases to look at when trying to analyse the welfare effects of a discriminatory trade liberalisation. An important case is the 3x3 model by Meade (1955) and later extended by Vanek (1965) and Lipsey (1970), which allows looking at the effects of trade modification[15]. The welfare effects will depend on the quality of the substitutes and complementary goods that are traded inside and outside the union. If the goods traded within the union are close substitutes with those traded with the ROW, we might expect a contraction of trade flows with countries that a not member of the trade agreement. On the other hand, if the two groups of goods are complementary we can expect an increase in trade with the ROW. The net welfare effect will then depend on the balance of three effects: trade creation, trade diversion and trade modification.

Let us assume a model with 3 countries (A, B and C), 3 goods (1, 2, and 3), where each country produces only one good: A produces good 1, B produces good 2, and C produces good 3. Countries A and B are the two members of the union, C plays the role of the ROW. The integration between countries A and B implies the elimination of tariffs on their reciprocal trade, this means that in the case of country A the domestic price of good 2 falls. The assumption that each good is produced only by one country ensures that there

[15] 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 (see Ethier and Horn, 1984).

is no trade diversion. Then, in the case of good 2 country A has a net welfare gain (the increases in the consumer surplus exceeds the loss of tariff revenues). The effect on the market of good 3 (which is only produced by the ROW) depends on if this good is substitute or complement of good 2. If goods produced inside and outside the union are substitutes, there is a reduction in the demand of good 3 in country A, this means a loss of tariff revenues as well as a reduction of the consumer surplus. On the other hand, if the two goods are complement, there is an increase in the demand of good 3 by country A, which raises the tariff collection and also increases the consumer surplus. In summary, the aggregate effect on country A's welfare depends on what happens in the markets of goods 2 and 3.

Vousden (1990) analyses the effect of marginal tariff reductions, he derives the complementary and substitutability conditions among goods traded inside and outside the union such that a net welfare gain is secured after the union. The members of the union would more likely to benefit from it when: the closer substitutes are the goods traded within the union and the less is the substitutability between goods traded within the union and those imported from the ROW. From these conditions we have that a successful integration agreement requires the countries involved in it to be as similar as possible (they produce close substitutes) and as dissimilar as possible to the ROW (a low substitutability among the goods produced by the members of the union and those produced by the ROW).

Panagariya (2000) points out that in the model with product differentiation *à la* Krugman (1980), the effects of a preferential trade agreements can be considered as an special case of the Meade-Vanek-Lipsey model, where the terms of trade with the ROW are not fixed (as a consequence of the product differentiation). In this sense, the introduction of product differentiation recovers a traditional result from Mundell (1964), which showed that when import demands for all goods show gross substitutability and initial tariffs are low, a discriminatory tariff reduction by one country increases the terms of trade of the country benefiting from the reduction with respect to both the country reducing the tariffs and the ROW, on the other hand, the terms of trade of the country reducing the tariffs might rise or fall with respect to countries outside the union.

As Venables (2003 and 2005) shows using a conventional trade model (HOS), the costs of trade diversion could be unevenly distributed across members of a regional integration agreement (RIA). In particular, in a RIA between developing countries (South), 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, which magnifies initial income disparities. MERCOSUR could be an example of South-

South agreement with an uneven distribution of trade diversion costs. Comparative advantages are more associated with the size and economic complexity of each country than with their level of development. The argument is based on the comparative advantage of member countries relative to each other and to the ROW. Following Venables (2003) let us assume three countries (1, 2 and ROW) and two goods (A and M). Let us also assume the ROW has a comparative advantage on good M, while country 1 has a comparative advantage in good A, with country 2 between 1 and the ROW. Then, a CU between countries 1 and 2 means that country 1's imports of M are diverted from the ROW and replaced, at least partially, with imports from country 2. The response to this outcome, according to Venables, is the liberalization of trade with the ROW.

An additional reason for observing an increase in the weight of intra-MERCOSUR imports *vis a vis* imports from the ROW is based on the prediction of the New Economic Geography models, 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). Then, a CU between countries of different sizes, may induce a further concentration of the production of manufactures in the larger partner, at least until some point, after which further integration will induce a more evenly distribution of IRS activities. However, in this case, the increase in the ratio of imports from within the block to imports from the ROW is not due to a change in the origin of imports, but by the substitution of local production with imports originated in other countries members of the agreement.

3.2. Preferences and trade flows

Zignago y Mayer (2004) defines a border effect measure estimating a model that explains the import ratio between the foreign and domestic markets. The micro-foundations of the estimable form employs the well know model of monopolistic competition applied to the international market (Krugman, 1980). They used domestic sales to normalize import from foreign markets, this requires the same level of product aggregation for production and trade statistics, however, the latter are usually available to a much greater detail, with production statistics being usually available with a too high level of aggregation. In the present paper we apply this model to derive an estimable equation of regional imports relative to imports from the rest of the world. The objective is to estimate the effect of regional tariff preferences over the structure of foreign expenditure from different origins.

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

$$U^z = \prod_{i \in I} \left(u_i^z\right)^{\theta_i^z} \qquad 0 < \theta_i^z < 1, \quad \sum_{i \in I} \theta_i^z = 1 \tag{3.1}$$

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

$$u_i^Z = \left(\sum_{j \in J} \sum_{n \in N_i^j} \left(c\left(n\right)_i^{z,j} \right)^{\frac{(\sigma-1)}{\sigma}} \right)^{\frac{\sigma}{(\sigma-1)}} \tag{3.2}$$

where $c\left(n\right)_i^{z,j}$ is the quantity consumed in country *z* of variety *n* produced by a firm in industry *i* located in country *j*[16]; $\sigma > 1$ is the elasticity of substitution. Utility maximisation subject to the consumer's budget constraint means:

$$c_i^{z,j} = \frac{\left(p_i^{z,j}\right)^{-\sigma}}{(P_i^z)^{1-\sigma}} \theta_i^z Y^z = \frac{\left(\tau_i^{z,j} p_i^j\right)^{-\sigma}}{(P_i^z)^{1-\sigma}} \theta_i^z Y^z \tag{3.3}$$

where: $p_i^{z,j}\left(p_i^j\right)$ is the consumer (producer) price in country z $\left(j\right)$ of every variety produced by sector *i*; $\tau_i^{zj} > 1$ are Samuelson's iceberg transport costs to go from *j* to *z*; θ_i^z is the share of country *z* income $\left(Y^z\right)$ 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 (3.1), (3.2) and (3.3) we have that total imports, including the proportion that melts in transit, by country z of varieties produced by sector *i* in country *j* are equal to:

$$M_i^{z,j} = N_i^j (p_i^j)^{1-\sigma} (\tau_i^{z,j})^{1-\sigma} \theta_i^z Y^z (P_i^z)^{\sigma-1} \tag{3.4}$$

where N_i^j is the number of varieties produced by sector *i* in country *j*;

Using (3.4) we have that for any country *z* and sector *i*, the ratio between imports from any two countries *j* and *h* is given by:

$$\frac{M_i^{z,j}}{M_i^{z,h}} = \frac{N_i^j}{N_i^h} \left(\frac{p_i^j}{p_i^h} \right)^{1-\sigma} \left(\frac{\tau_i^{z,j}}{\tau_i^{z,h}} \right)^{1-\sigma} \qquad j,h \in J \text{ and } j \neq h \tag{3.5}$$

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

$$V_i^j = p_i^j q_i^j N_i^j \tag{3.6}$$

[16] For a matter of simplicity we will obviate the use of the index *n*.

Under the usual assumptions of the Dixit-Stiglitz monopolistic competitive model, and assuming all countries have access to the same technology, is possible to show that the scale of production for each firm is identical across countries $\left(q_i^j = q_i^h = q_i,\ \ j,h \in J \text{ and } j \neq h\right)$. Using this result and (3.6) we have:

$$\frac{N_i^j}{N_i^h} = \frac{p_i^h V_i^j}{p_i^j V_i^h} \qquad j,h \in J \text{ and } j \neq h \tag{3.7}$$

With respect to transactions costs (τ_i^{zj}), they depends on the distance between markets through a general function $\delta^{z,j}$, tariffs $\left(T_i^{z,j}\right)$, and others non-tariff barriers (ntb_i^z) which are assumed to be applied in a non discriminatory way[17]. More specifically, transports costs are assumed to take the following form:

$$\tau_i^{z,j} = \delta^{z,j}\left(1 + T_i^{z,j}\right)\left(1 + ntb_i^z\right) \tag{3.8}$$

where $T_i^{z,j}$ is the import tariff imposed by country *z* on imports of goods produced by sector *i* in country *j*. Using (3.8) we have:

$$\frac{\tau_i^{z,j}}{\tau_i^{z,h}} = \frac{\delta^{z,j}}{\delta^{z,h}}\left(\frac{1 + T_i^{z,j}}{1 + T_i^{z,h}}\right) \ \ j,h \in J \text{ and } j \neq h \tag{3.9}$$

Substituting equations (3.7) and (3.9) into equation (3.5), the ratio of imports by country *z* of goods produced by sector *i* in countries *j* and *h* is equal to:

$$\frac{M_i^{z,j}}{M_i^{z,h}} = \frac{V_i^j}{V_i^h}\left(\frac{p_i^{z,j}}{p_i^{z,h}}\right)^{-\sigma}\left(\frac{\delta^{z,j}}{\delta^{z,h}}\frac{1 + T_i^{z,j}}{1 + T_i^{z,h}}\right)^{1-\sigma} \tag{3.10}$$

4. Empirical specification

As pointed out in the Introduction, the aim of our research is to evaluate the role of tariff preferences under the MERCOSUR on the regional patterns of imports of its country members.

Based on the model of the former 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:

$$\ln\left(m_{i,t}^z\right) = \alpha_0 + \sum_{l=1}^{L}\beta_l \ln\left(m_{i,t-l}^z\right) + \phi_1 \ln\left(rer_{i,t}^z\right) + \phi_2 \ln\left(T\_Pref_{i,t}^z\right) + \varepsilon_{i,t}^z \tag{4.1}$$

[17] 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 acquires more importance in sectors such as the automotive industry, where an intricate set of rules regulate trade among MERCOSUR's members.

where:

- *z*: importer country member of the regional agreement.
- *i*: 4-digit code sector according to the Harmonised System Classification.
- *t:* time.
- $m_{i,t}^{z}$: country *z*'s imports in year *t* of goods produced by sector *i* originated in MCS(-1) divided by country *z*'s imports in year *t* of goods produced by sector *i* originated in ROW.[18]
- *rer*: 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* and the US dollar.
- *T_Pref*: tariff preference granted to other MERCOSUR countries measured as $\left(\left(1+T_i^{Z,MCS}\right)/\left(1+T_i^{Z,MFN}\right)\right)$ 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 Favoured Nation rate levied on the same good *i* by country *Z*.
- $\varepsilon_{i,t}^{z}$: error term which is assumed to have the following structure $\varepsilon_{i,t}^{z} = \lambda_t^z + \eta_i^z + \nu_{i,t}^z$, where λ_t^z and η_i^z are, respectively, a time and sector specific effect.

One way to test if the MERCOSUR affected the import patterns of its members, would be through the estimation of equation 4.1 for before and after MERCOSUR was signed, and test if the coefficient ϕ_2 is the same for both periods. To follow this approach would require data on both imports and tariff preferences before the MERCOSUR was launched. However, data availability prevents us following this strategy. Firstly, statistics on tariff preferences are not easily available for before the MERCOSUR. Considering the limited scope of the integration process during pre-MERCOSUR times, one alternative would be to assume that pre-MERCOSUR preferences were constant at their values immediately before the MERCOSUR started. A second, and more difficult, problem to overcome is that countries good classifications used before the implementation of the Harmonised System Classification (HS) at the beginning of the nineties do not allow us to homogenize statistics for before and after MERCOSUR, at least at the level of detail used here. Because of these restrictions, the results reported below must not be understood as measuring the change in the role of tariff preferences due to the MERCOSUR, but just the effect of tariff preferences since the launching of MERCOSUR.

An important element when evaluating any preferential trade agreement is the presence of trade diversion. Within the stylized theoretical framework of section three, where goods are differenced across sectors and countries, such that each variety is

[18] 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).

produced just by a single producer, there is no place for the presence of trade diversion, at least in the usual sense of the concept, that is the shift in domestic consumption from a low-cost source (the ROW) to a higher-cost source (a partner of the regional agreement). However, since the empirical application is carried out with some level of aggregation (four digits of the HS), we might expect the existence of some kind of trade diversion effect since goods sharing some common characteristics, which we may assume are 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 group dummies, with the dummies being constructed taking into account 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 2 describes how the dummies are constructed[19].

Table 2: d_g^Z dummies

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

(+) The country/region has a RCA, (-) The country/region does not have a RCA. MCS(-1) makes reference to the other three MERCOSUR members than country *Z*.

In the case of the interaction between the tariff preference variable and the dummy dg_1 there is not a priori any strong expectation with respect to the sign of the coefficient, since in this case 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 tariff preferences are interacted with the dummy dg_2 we expect the estimated coefficient to be negative and statistically significant, since it is for goods included into this group that the other members of MERCOSUR have a comparative advantage, while the ROW has a comparative disadvantage. Finally, goods included into the group corresponding to the dummy dg_3 are those for which the other three members of the MERCOSUR have a comparative disadvantage, while the ROW has a comparative advantage, in this case we may expect the estimated coefficient to be not statistically significant. If this is not the

[19] We thank Marcelo Olarreaga for suggesting this classification.

case, and the estimated coefficients are negative and significant, we might understand this finding as evidence in favour of a trade diversion effect.

4.1. Econometric issues

A problem with the estimation of equation 4.1 is produced by the presence on the RHS of the dependent variable lagged one or more periods, which by definition are correlated with the error term. This correlation between some of the explanatory variables and the error term means that the results obtained from applying the Least Square Dummy Variable (LSDV) estimator are inconsistent.[20] Anderson and Hsiao (1981) suggested, for the case of an AR(1) model (i.e. $y_{i,t} = \alpha y_{i,t-1} + \eta_i + \nu_{i,t}$), a two-step procedure for the equation in first-difference such that it eliminates the specific effect η_i, and with the lagged first difference of the dependent variable $\left(\Delta y_{i,t-1}\right)$ on the RHS being instrumented with $y_{i,t-2}$. If $y_{i,1}$ is uncorrelated with the subsequent disturbances $\nu_{i,t}$ for *t=2,3,…,T* , and the error term $\nu_{i,t}$ is not serially correlated, the Anderson-Hsiao estimator produces consistent estimations when *N* (the number of cross section units) is large and *T* (the number of time periods) is fixed. Anderson and Hsiao (1982) extend the analysis to the case with exogenous variables on the RHS. Arellano and Bond (1991) proposed a GMM procedure to obtain additional instruments using all available lags of the dependent variable. Additionally, if like in the case of equation 4.1, other explanatory variables appear in the RHS (i.e. $y_{i,t} = \alpha y_{i,t-1} + \beta x_{i,t} + \eta_i + \nu_{i,t}$,) three cases need to be considered (Bond, 2002): Firstly, if $x_{i,t}$ is assumed to be endogenous, it is correlated with contemporaneous $\left(\nu_{i,t}\right)$ and past $\left(\nu_{i,t-1}, \nu_{i,t-2}, ..., \nu_{i,t-n},\right)$ shocks, but uncorrelated with subsequent shocks $\left(\nu_{i,t+1}, \nu_{i,t+2}, ..., \nu_{i,t+n},\right)$, they are treated in the same way as the dependent variable, with $x_{i,t-2}$, $x_{i,t-3}$ and longer lags being valid instruments for the equation in first difference. Secondly, if $x_{i,t}$ is assumed to be predetermined in the sense that it is uncorrelated with the contemporaneous error $\nu_{i,t}$, $x_{i,t-1}$ can be also used as instrument. Finally, under the strongest assumption that $x_{i,t}$ is exogenous, it is also uncorrelated with past shocks, the whole series $x_{i,1}$, $x_{i,2}, ..., x_{i,T}$ can be used as instruments.

[20] As reported by Judson and Owen (1999) through the use of Monte Carlo simulations, the estimation bias is more severe in the case of the coefficients for the lagged dependent variable than for the other variables included in the RHS of the equation. Bun and Kiviet (2003) obtain similar results.

A potential problem with Arellano and Bond (1991) estimator is that lagged levels might be poor instruments for first differences, causing large sample bias when time series are persistent and *T* is small (Blundell and Bond, 1998). Under these circumstances, Blundell and Bond (1998) proposed a GMM estimator for the levels equations, with lagged first-differences and lagged levels of the dependent variable used as instruments. If other regressors $x_{i,t}$ are included, and we assume they are uncorrelated with the cross-section specific effects η_i, lagged values of $x_{i,t}$ can be used as instruments in the levels equations . If $x_{i,t}$ is correlated with the specific effects η_i, but its first-difference is not, $\Delta x_{i,t}$ and $\Delta y_{i,t}$ can be used as instruments in the levels equations (Bond, 2002).

As said before, the problem with the LSDV estimator is that it produces inconsistent results because of the correlation between the cross-section specific effects η_i and the lags of the dependent variable, the bias approaches zero as *T* approaches infinity. Nickell (1981) analyses the case of a balanced AR(1) model when N approaches infinity, while Kiviet (1995) and Kiviet (1999) concentrate on the case when N is small. Bruno (2005a) obtains an expression for the bias in the case of unbalanced panels. Applications of the corrected LSDV estimator (LSDVC) are, among others, Judson and Owen (1999), Léger (2006) and Bruno (2005b). Using Monte Carlo simulations, Judson and Owen (1999) find out that when the time dimension of the panel is small, the LSDVC estimator is preferred. Bruno (2005b) also finds out that LSDVC performs better than the Anderson-Hsiao estimator, as well as than Arellano-Bond and Blundell-Bond GMM estimators, in the case of unbalanced panels where the cross-section dimension is small. A problem with the LSDVC estimator is that it assumes all other regressors are exogenous. Below we report the results obtained from the application of the Blundell-Bond (BB) estimator. [21]

Finally, in order to check for the robustness of the results, equation 4.1 is estimated using alternative samples according to two criteria: sectors and coverage in time and import shares (Table 3).

[21] All estimations were carried out using Stata's routine xtabond2 (Roodman, 2005).

Table 3: Alternatives Samples for estimation

Sectors	Other Criteria	
	None	Sector *i* represent at least 0.05% of total imports at least in 10 years
All	Sample A.1	Sample A.2
Manufactures (*)	Sample M.1	Sample M.2

(*) HS codes 2800 to 9618.

4.2. Results

In this section we present the results for alternative specifications of equation 4.1 for each of the four members of MEROSUR. We run two regressions, in column 1 all available lags were used as instruments, while in column 2 the first available lag was not included into the set of instruments. In all cases the real exchange rate and tariff preference variables are considered as predetermined. Tables 4 and 5 present the result using sample A.2.[22]

Table 4 reports the results when the tariff preference variable is not interacted with the group dummies. As shown there in all cases the estimated coefficients have the expected sign, however, they are not statistically significant in the case of Brazil. This result means that in the cases of Argentina, Paraguay and Uruguay, an increase in the tariff preference in sector *i*, measured by a reduction in $\left(1+T_i^{Z,MCS}\right)/\left(1+T_i^{Z,MFN}\right)$, induces to an increase in the value of imports from other MERCOSUR countries relative to imports from countries which do not benefit from a preferential treatment. Because the presence of lags of the dependent variable on the RHS of equation 4.1, the coefficient for the tariff preference variable measures the short run effect on the ratio between intra-MERCOSUR imports and imports from the ROW. From the results in Table 4, this effect is more important in the case of Uruguay, with Paraguay at the other extreme. However, in this last case the coefficients are significant only at 10%, while for Argentina and Uruguay they are at 1%. As expected, in all cases the tests on the residuals reject the null of no first order serial correlation in first differences (AR(1)), while the null of no second order serial correlation in second differences (AR(2)) is not rejected in all cases. Finally, the Sargan Test on whether the instruments, as a group, appear exogenous is not rejected in all cases; for Argentina this is true at 7.6% and 6.8% level of significance.

When the tariff preference variable is interacted with the dummy variables (Table 5) we obtain that the estimated coefficients are statistically significant in all cases for Argentina and Uruguay, for Brazil the same applies to the interaction with dg_1 and dg_2,

[22] Results for samples A.1, M.1 and M.2 are reported in the Appendix.

whilst for Paraguay the coefficient is statistically significant in the case of the interaction with the dummy dg_2[23]. As in the previous case, the autocorrelation and Sargan tests give the expected results. With respect to the magnitude of the effects across sectors, we obtain that, as could be expected, this is larger in the case of sectors included into dg_2, those corresponding to sectors where others MERCOSUR members have a RCA while the ROW does not, the exception is Uruguay where the coefficient for the interaction between *T_Pref* and dg_1 is the largest but pretty similar to the one for the interaction with dg_2. If we look at the differences across countries no clear pattern arises, depending on the case we look at.

An important point to look at is the coefficient corresponding to the interaction with the dummy variable dg_3. As explained before, this dummy corresponds to sectors for which the other three members of the MERCOSUR have a comparative disadvantage, while the ROW has a comparative advantage, such that a negative and significant coefficient may be understood as evidence pointing out to a trade diversion effect. As shown in Table 5, this is indeed the case for Argentina and Uruguay; however the estimated coefficients are lower than those for the other two groups, especially for Uruguay.

As said above, the presence of lags of the dependent variable on the RHS of equation 4.1. means that the coefficient for *T_Pref* measures the short-run effect of a change in preferences granted under the MERCOSUR. Table 6 presents the long-run effects, which are given by $\phi_2 \Big/ \left(1 - \sum_{l=1}^{L} \beta_l \right)$. As shown there, in the case of no interaction with the dummy variables, the effect of tariff preferences granted under the MERCOSUR has been more important for Argentina, followed by Paraguay and Uruguay, in this last case the estimated effect is a half or even less than the obtained for he other two countries. When we allow the effect of the variable *T_Pref* to vary across sectors two cases deserve a close attention. In the case of the interaction with the dummy dg_2, which might reflect the presence of trade creation, since this dummy includes sectors for which the other members of MERCOSUR have a comparative advantage, while the ROW has a comparative disadvantage, the largest effects correspond to Brazil and Argentina, with Paraguay, and especially Uruguay, showing a lower impact. On the other hand, for the interaction with dg_3, which as pointed out before gives an indication of the presence of trade diversion, Argentina shows values twice as large as the obtained for Uruguay. For the other two countries no significant effect was found.

[23] In the case of Paraguay we do not include sectors corresponding to the dummy group 1 since only two sectors falls into this category making unreliable estimating a single coefficient for just these two sectors.

The results just presented are in line with the argument suggested by Venables (2003 and 2005) and outlined above at the end of section 3.1. As mentioned there, Venables argues that from the countries involved in RIAs, the most vulnerable to trade diversion are the countries with more extreme comparative advantages. Then, is no 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 the results showed, this is not the case for Paraguay. Two concurrent elements may help to explain this outcome. Firstly, due in part to its geographical situation, 87.9% of its international boundaries is shared with Brazil and Argentina, imports from other MERCOSUR members already represented at the beginning of the integration process a very high proportion of the country's imports, especially those of manufactures. Secondly, footloose activities such as manufactures represent a relatively small proportion of Paraguay's economy such that there was not a priori much scope for location effects taking 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, part of the industrial sector that emerged under the protection of the import substitution policy[24] was not in condition to compete with Brazil's manufacturing sector once intra-MERCOSUR tariffs were reduced; additionally the larger Brazilian domestic market may have acted as a strong centripetal force, with Argentinean producers moving part of their production to Brazil. For instance, even in the food industry, a sector Argentina has an important comparative advantage; some of the largest domestic firms made important direct investments in Brazil.

[24] Using values at 1993 prices, the share of manufactures in Argentina's GDP felt 15.7% between 1993 and 2002. In despite of the reversion of this tendency in recent years, in 2006 the figure is still 8.8% lower than in 1993.

Table 4

Results from equation 4.1[(a)]

	ARGENTINA		BRAZIL		PARAGUAY		URUGUAY	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Imports(-1)	0.6916***	0.6269***	0.6404***	0.4478***	0.6233***	0.5593***	0.6759***	0.5792***
	(0.0427)	(0.0925)	(0.0375)	(0.1383)	(0.0395)	(0.0976)	(0.0356)	(0.1713)
Imports(-2)	0.2253***	0.2726***	0.1534***	0.2686***	0.1626***	0.2106***	0.0761**	0.1140
	(0.0403)	(0.0771)	(0.0483)	(0.1002)	(0.0376)	(0.0668)	(0.0319)	(0.1389)
Imports(-3)					0.1253***	0.1452***		
					(0.0365)	(0.0470)		
Rer	-0.6591	-0.3728	0.4457	0.1559	-0.2462	-0.0054	-0.5280*	-0.5613*
	(0.6118)	(0.7040)	(0.7513)	(0.8809)	(0.4221)	(0.4477)	(0.3187)	(0.3366)
Preference	-1.4064***	-1.6483***	-0.8454	-1.1375	-0.9939*	-0.9791*	-1.8699***	-1.9891***
	(0.3645)	(0.4445)	(0.7481)	(0.9492)	(0.5673)	(0.5920)	(0.6164)	(0.7044)
Observations	2972	2972	2520	2520	2070	2070	2319	2319
N. Cross Sections	272	272	215	215	192	192	233	233
Sargan Test (+)	103.2	90.7	103.4	91.3	118.1	104.8	83.8	72.7
Sargan Test - P. value	0.076	0.068	0.336	0.302	0.163	0.171	0.142	0.126
AR(1) (++)	-4.2	-3.2	-3.8	-2.3	-5.3	-3.8	-5.7	-2.3
AR(1) - P. value	0.000	0.001	0.000	0.021	0.000	0.000	0.000	0.019
AR(2) (+++)	-0.7	-1.1	0.3	-0.7	0.1	-0.4	0.3	-0.2
AR(2) - P. value	0.460	0.293	0.772	0.475	0.915	0.713	0.741	0.857

Notes: (a) using sample A.2 (see Table 3). (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5

Results from equation 4.1[(a)]

	ARGENTINA		BRAZIL		PARAGUAY		URUGUAY	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Imports(-1)	0.6837***	0.6052***	0.6331***	0.4380***	0.6144***	0.5410***	0.6723***	0.5265***
	(0.0439)	(0.0949)	(0.0369)	(0.1363)	(0.0401)	(0.0943)	(0.0327)	(0.1589)
Imports(-2)	0.2190***	0.2751***	0.1480***	0.2573***	0.1544***	0.2048***	0.0721**	0.1465
	(0.0404)	(0.0767)	(0.0479)	(0.0959)	(0.0370)	(0.0646)	(0.0309)	(0.1272)
Imports(-3)					0.1239***	0.1362***		
					(0.0352)	(0.0459)		
Rer	-0.9597	-0.6420	0.0540	-0.4592	-0.2440	0.0208	-0.6231*	-0.6866*
	(0.6507)	(0.7313)	(0.6910)	(0.8273)	(0.4406)	(0.4680)	(0.3250)	(0.3499)
Preference x dg_1	-1.3585***	-1.7509***	-2.1548**	-3.0166**			-4.9711***	-5.7887***
	(0.4212)	(0.4981)	(0.9582)	(1.1661)			(1.3698)	(1.5105)
Preference x dg_2	-2.7406***	-3.2045***	-6.1841***	-8.8221***	-2.3039***	-2.2539**	-4.2454***	-4.6833***
	(0.6420)	(0.7858)	(1.8979)	(2.7355)	(0.8111)	(1.0678)	(0.9463)	(1.0919)
Preference x dg_3	-1.3246***	-1.5365***	0.1191	0.1426	-0.6856	-0.8368	-1.5678***	-1.6295**
	(0.3482)	(0.4064)	(0.9178)	(1.1467)	(0.6105)	(0.6491)	(0.5737)	(0.6784)
Observations	2972	2972	2520	2520	2070	2070	2319	2319
N. Cross Sections	272	272	215	215	192	192	233	233
Sargan Test (+)	101.9	88.3	101.6	87.7	119.0	104.0	83.1	71.4
Sargan Test - P. value	0.089	0.093	0.381	0.399	0.149	0.184	0.155	0.149
AR(1) (++)	-4.2	-3.2	-3.8	-2.4	-5.4	-3.9	-5.7	-2.3
AR(1) - P. value	0.000	0.002	0.000	0.019	0.000	0.000	0.000	0.019
AR(2) (+++)	-0.7	-1.1	0.3	-0.7	0.2	-0.4	0.4	-0.4
AR(2) - P. value	0.477	0.260	0.747	0.496	0.879	0.667	0.701	0.656

Notes: (a) using sample A.2 (see Table 3). (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Long Run Effects of Tariff Preferences

$$\phi_2 \Big/ \left(1 - \sum_{l=1}^{L} \beta_l\right)$$

Variable	Country	(1)	(2)
Preference	Argentina	-16.92	-16.40
	Brazil	-4.10	-4.01
	Paraguay	-11.19	-11.53
	Uruguay	-7.54	-6.48

Variable	Country	(1)	(2)
Preference x dg_1	Argentina	-13.96	-14.63
	Brazil	-9.84	-9.90
	Paraguay		
	Uruguay	-19.45	-17.70
Preference x dg_2	Argentina	-28.17	-26.77
	Brazil	-28.25	-28.95
	Paraguay	-21.47	-19.10
	Uruguay	-16.61	-14.32
Preference x dg_3	Argentina	-13.61	-12.84
	Brazil	0.54	0.47
	Paraguay	-6.39	-7.09
	Uruguay	-6.13	-4.98

Notes: (1): using all available lags as instruments. (2): first available lag not used as instrument.

5. Summary and Conclusions

In July 1991, Argentina, Brazil, Paraguay and Uruguay signed the Asuncion Treaty giving birth to the MERCOSUR. Under the MERCOSUR, the four countries implemented an automatic, and relatively fast, reduction of tariffs and non-tariff barriers within the zone. In 1995 a common external tariff policy on imports from third countries was adopted. In both cases, intra- and extra-zone trade barriers, countries have still some degree of freedom to implement their own policies, however this is quite limited. The homogenization of tariff barriers has gone much further than that of non-tariff barriers.

As MERCOSUR deepened further, intra-zone trade increased its share in total trade[25]; this behaviour acquires more relevance if we take into account that during the same period both total exports and imports increased substantially. In most cases, increasing intra-zone trade meant an increasing participation of goods where MERCOSUR members did not have a revealed comparative advantage at the beginning of the integration process. In the case of exports to the ROW, the share of these kinds of

[25] There has been in most cases a reversion of this tendency since the late nineties.

good increased at a faster rate than intra-MERCOSUR exports. The opposite happened in the case of imports. When looking at the importance of these sectors across the four countries, there is not much difference in the case of imports from the ROW, while for intra-MERCOSUR imports the importance of these sectors is larger in the cases of Uruguay, Argentina and Paraguay, than for Brazil.

In order to measure to what extent the reduction of intra-zone barriers under the MERCOSUR affected the import patterns of its members, in section 3 we derived an equation based on Krugman (1980) monopolistic competitive model for international trade to explain, for a given country *z*, the ratio of imports of good *i* from any two countries *j* and *h*. The results from the empirical model in section 4 show that tariff preferences granted under the MERCOSUR had a significant effect on the import patterns of Argentina and Uruguay, and to a less extent in the cases of Brazil and Paraguay. Also, in the cases of Argentina and Uruguay, the results appears to sustain the hypothesis that the MERCOSUR may have induced a trade diversion effect, while no such effect arises for the other two countries.

References

Anderson, T. W. and C. Hsiao (1981). "Estimation of Dynamic Models with Error Components". Journal of the American Statistical Association, 76, 598-606.
Anderson, T. W. and C. Hsiao (1982). "Formulation and Estimation of Dynamic Models Using Panel Data". Journal of Econometrics, 18, 47–82.
Arellano, M. and S. Bond (1991). "Some Tests of Specification for Panel Data, Monte Carlo Evidence and an Application to Employment Equations". Review of Economics Studies, 28, 277-297.
Blundell, R. and S. Bond (1998). "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models". Journal of Econometrics 87, 115–143.
Bond, S. (2002). "Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice". Institute for Fiscal Studies, Centre for Micro Data methods and Practice, WP CWP09/02.
Bruno, G. S. F. (2005a). "Approximating the Bias of the LSDV Estimator for Dynamic Unbalanced Panel Data Models". Economics Letters, 87(3), 361-366.
Bruno, G. S. F. (2005b). "Estimation and Inference in Dynamic Unbalanced Panel Data Models with a Samll Number of Individuals". Centro di Ricerca sui Processi di Innovazione e Internazionalizzazione, WP 165.
Bruno, G. S. F. (2005c). "XTLSDVC: Stata module to estimate bias corrected LSDV dynamic panel data models". http://ideas.repec.org/c/boc/bocode/s450101.html
Bun, M. J. G. and J. F. Kiviet (2003). "On the diminishing returns of higher order terms in asymptotic expansions of bias". Economics Letters 79: 145–152.
Dixit, A. and J. E. Stiglitz (1977). "Monopolistic competition and optimum product diversity". American Economic Review, 67, 297-308.
Ethier, W. and H. Horn (1984), "A New Look at Economic Integration", in Monopolistic Competition and International Trade, H. Kierzkowski (ed.), Oxford: Clarendon Press, 207-229.
Frankel, J. (1997). "Regional Trading Blocs in the world economic system", Institute of International Economics, Washington.

Judson, R. A. and A. L. Owen (1999). "Estimating dynamic panel data models: a guide for macroeconomists". Economics Letters, 65, 9–15.
Kiviet, J. F. (1995). "On bias, inconsistency, and efficiency of various estimators in dynamic panel data models". Journal of Econometrics 68, 53–78.
Kiviet, J. F. (1999). "Expectation of Expansions for Estimators in a Dynamic Panel Data Model: Some Results for Weakly Exogenous Regressors". In Analysis of Panels and Limited Dependent Variable Models, eds. L-F. L.C. Hsiao, K. Lahiri and M. H. Pesaran, 199–225. Cambridge: Cambridge University Press.
Krugman, P. (1980). "Scale economics, product differentiation, and the pattern of trade", American Economic Review, 70, 950-959.
Léger, A. (2006). "Intellectual Property Rights and Innovation in Developing Countries: Evidence from Panel Data". Paper presented at the International J.A. Schumpeter Society 11th ISS Conference: "Innovation, Competition and Growth: Schumpeterian Perspectives", Nice–Sophia-Antipolis, 21-24 June, 2006.
Lipsey, R. G. (1970). "The theory of customs unions: a general equilibrium analysis". London: Weidenfeld and Nicolson.
Mayer, T. and S. Zignago (2004). "Market access in global and regional trade", Working Paper CEPII No 14.
Meade, J. F. (1955). "The theory of customs unions". Amsterdam: North Holland.
MERCOSUR Secretariat (2005). "Evolución de las preferencia arancelarias en el comercio intrazona 1991-2004". Reporte Técnico 007/05, Consultaría Económica del Sector de Asesoría Técnica del MERCOSUR.
Mundell, R (1964). Tariff preferences and the terms of trade", Manchester School of Economics Social Studies.
Nickell, S. J. (1981). "Biases in Dynamic Models with Fixed Effects". Econometrica, 49, 1417–1426.
Panagariya A. (2000). "Preferential trade liberalization: the traditional theory and new developments". Journal of Economic Literature, 38, 287-331.
Roodman, D. (2005). "xtabond2: Stata module to extend xtabond dynamic panel data estimator". Center for Global Development, Washington.
http://econpapers.repec.org/software/bocbocode/s435901.htm
Vanek, J. (1965). "General equilibrium of international discrimination: the case of customs unions". Cambridge, Mass.: Harvard University Press.
Venable, A. J. (2003). "Winners and losers from regional integration agreements". The Economic Journal, 113 (October), 747–761.
Venables, J. A. (2005). "Regional disparities in regional blocs: theory and policy". Paper prepared for the Inter-American Development Bank project on 'Deeper integration of Mercosur; dealing with disparities'.
Viner, J. (1950). "The Customs Unions Issue". New York: Carnegie Endowment for International Peace.
Vousden, N. (1990). "The Economics of Trade Protection", Cambridge University Press, USA.
Yeats, A. (1997). "Does MERCOSUR´s Trade performance raise concerns about the effect of regional trade arrangements", Policy Research Working Paper 1729, World Bank.

Appendix

Country	**ARG**	**ARG**	**ARG**	**ARG**	**ARG**	**ARG**	**ARG**	**ARG**
Estimator	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**
Sample	**A1**	**A1**	**A2**	**A2**	**M1**	**M1**	**M2**	**M2**
Imports(-1)	0.5577***	0.5319***	0.6916***	0.6269***	0.6033***	0.5936***	0.6700***	0.5873***
	(0.0268)	(0.1012)	(0.0427)	(0.0925)	(0.0259)	(0.0967)	(0.0468)	(0.0888)
Imports(-2)	0.1078***	0.1599***	0.2253***	0.2726***	0.1648***	0.1953***	0.2394***	0.3121***
	(0.0270)	(0.0606)	(0.0403)	(0.0771)	(0.0276)	(0.0627)	(0.0435)	(0.0787)
Rer	-0.9458*	-0.9860**	-0.6591	-0.3728	-0.8065	-0.7539	-0.3659	-0.4218
	(0.5117)	(0.4721)	(0.6118)	(0.7040)	(0.4898)	(0.4611)	(0.6552)	(0.7253)
Preference	-1.7880***	-1.8347***	-1.4064***	-1.6483***	-1.8426***	-1.8938***	-1.4535***	-1.5717***
	(0.4361)	(0.4326)	(0.3645)	(0.4445)	(0.3815)	(0.4310)	(0.3794)	(0.4148)
Observations	9539	9539	2972	2972	8000	8000	2757	2757
N. Cross Sections	1032	1032	272	272	839	839	252	252
Sargan Test (+)	136.7	116.6	103.2	90.7	131.0	106.7	108.8	82.9
Sargan Test - P. value	0.000	0.001	0.076	0.068	0.001	0.005	0.036	0.178
AR(1) (++)	-11.3	-4.6	-4.2	-3.2	-10.0	-4.8	-4.0	-3.1
AR(1) - P. value	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002
AR(2) (+++)	1.1	-0.2	-0.7	-1.1	0.2	-0.3	-0.7	-1.3
AR(2) - P. value	0.257	0.868	0.460	0.293	0.877	0.779	0.495	0.211

Notes: (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Country	**ARG**	**ARG**	**ARG**	**ARG**	**ARG**	**ARG**	**ARG**	**ARG**
Estimator	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**
Sample	**A1**	**A1**	**A2**	**A2**	**M1**	**M1**	**M2**	**M2**
Imports(-1)	0.5599***	0.5389***	0.6837***	0.6052***	0.6003***	0.5817***	0.6611***	0.5672***
	(0.0270)	(0.0991)	(0.0439)	(0.0949)	(0.0260)	(0.0966)	(0.0479)	(0.0906)
Imports(-2)	0.1112***	0.1605***	0.2190***	0.2751***	0.1641***	0.2006***	0.2336***	0.3130***
	(0.0268)	(0.0599)	(0.0404)	(0.0767)	(0.0273)	(0.0618)	(0.0433)	(0.0782)
Rer	-0.8697*	-0.9174**	-0.9597	-0.6420	-0.8058*	-0.7353	-0.6413	-0.6911
	(0.4825)	(0.4542)	(0.6507)	(0.7313)	(0.4740)	(0.4536)	(0.7002)	(0.7779)
Preference x dg_1	-2.6783***	-2.5148***	-1.3585***	-1.7509***	-2.5959***	-2.6279***	-1.4375***	-1.7102***
	(0.6844)	(0.6771)	(0.4212)	(0.4981)	(0.6345)	(0.6985)	(0.4732)	(0.5188)
Preference x dg_2	-5.1042***	-4.8999***	-2.7406***	-3.2045***	-4.2567***	-4.0415***	-2.8782***	-3.1127***
	(0.6943)	(0.8965)	(0.6420)	(0.7858)	(0.6565)	(0.8702)	(0.6837)	(0.7155)
Preference x dg_3	-1.2296***	-1.3208***	-1.3246***	-1.5365***	-1.4904***	-1.5938***	-1.3907***	-1.4860***
	(0.4169)	(0.3913)	(0.3482)	(0.4064)	(0.3599)	(0.3954)	(0.3660)	(0.4039)
Observations	9539	9539	2972	2972	8000	8000	2757	2757
N. Cross Sections	1032	1032	272	272	839	839	252	252
Sargan Test (+)	141.7	119.6	101.9	88.3	133.2	109.0	108.2	81.3
Sargan Test - P. value	0.000	0.000	0.089	0.093	0.001	0.003	0.039	0.213
AR(1) (++)	-11.3	-4.7	-4.2	-3.2	-10.0	-4.8	-4.0	-3.0
AR(1) - P. value	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.003
AR(2) (+++)	1.1	-0.1	-0.7	-1.1	0.2	-0.4	-0.7	-1.3
AR(2) - P. value	0.280	0.882	0.477	0.260	0.871	0.710	0.506	0.189

Notes: (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Country	**BRA**	**BRA**	**BRA**	**BRA**	**BRA**	**BRA**	**BRA**	**BRA**
Estimator	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**
Sample	**A1**	**A1**	**A2**	**A2**	**M1**	**M1**	**M2**	**M2**
Imports(-1)	0.5931***	0.8064***	0.6404***	0.4478***	0.5978***	0.6427***	0.6459***	0.4768***
	(0.0274)	(0.1181)	(0.0375)	(0.1383)	(0.0271)	(0.1225)	(0.0492)	(0.1414)
Imports(-2)	0.0549***	-0.0874	0.1534***	0.2686***	0.0455**	0.0105	0.1696***	0.2626**
	(0.0205)	(0.0745)	(0.0483)	(0.1002)	(0.0211)	(0.0754)	(0.0620)	(0.1068)
rer	1.8024***	1.5332***	0.4457	0.1559	1.4671**	1.3628**	0.1707	-0.0127
	(0.5302)	(0.5616)	(0.7513)	(0.8809)	(0.5981)	(0.6457)	(0.7534)	(0.8112)
Preference	1.5319**	1.2871**	-0.8454	-1.1375	0.5235	0.3697	-1.1557	-1.0377
	(0.6151)	(0.5491)	(0.7481)	(0.9492)	(0.6909)	(0.6554)	(0.7022)	(0.9830)
Observations	8641	8641	2520	2520	6990	6990	2246	2246
N. Cross Sections	962	962	215	215	767	767	192	192
Sargan Test (+)	178.2	147.7	103.4	91.3	159.3	138.3	102.0	91.0
Sargan Test - P. value	0.000	0.000	0.336	0.302	0.000	0.000	0.370	0.309
AR(1) (++)	-11.3	-5.2	-3.8	-2.3	-9.8	-4.2	-3.5	-2.3
AR(1) - P. value	0.000	0.000	0.000	0.021	0.000	0.000	0.001	0.023
AR(2) (+++)	-0.2	1.6	0.3	-0.7	0.3	0.5	0.5	-0.4
AR(2) - P. value	0.845	0.111	0.772	0.475	0.786	0.594	0.631	0.720

Notes: (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Country	**BRA**	**BRA**	**BRA**	**BRA**	**BRA**	**BRA**	**BRA**	**BRA**
Estimator	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**
Sample	**A1**	**A1**	**A2**	**A2**	**M1**	**M1**	**M2**	**M2**
Imports(-1)	0.5899***	0.7816***	0.6331***	0.4380***	0.6013***	0.6463***	0.6406***	0.4582***
	(0.0274)	(0.1160)	(0.0369)	(0.1363)	(0.0268)	(0.1189)	(0.0494)	(0.1380)
Imports(-2)	0.0506**	-0.0773	0.1480***	0.2573***	0.0462**	0.0081	0.1679***	0.2594**
	(0.0206)	(0.0732)	(0.0479)	(0.0959)	(0.0210)	(0.0741)	(0.0612)	(0.1022)
rer	1.5901***	1.3810**	0.0540	-0.4592	1.3201**	1.2058*	0.0699	-0.2748
	(0.5175)	(0.5404)	(0.6910)	(0.8273)	(0.5823)	(0.6228)	(0.7108)	(0.7747)
Preference x dg_1	-0.3438	-0.1701	-2.1548**	-3.0166**	-1.2288*	-1.2158*	-2.5998***	-3.4619***
	(0.7021)	(0.5923)	(0.9582)	(1.1661)	(0.7384)	(0.7230)	(0.8771)	(1.1807)
Preference x dg_2	-5.5442***	-4.8097***	-6.1841***	-8.8221***	-5.1165***	-5.2301***	-4.4457***	-6.7131***
	(0.9983)	(1.0722)	(1.8979)	(2.7355)	(0.9698)	(1.1396)	(1.2615)	(2.0833)
Preference x dg_3	2.4193***	1.9676***	0.1191	0.1426	1.1068*	0.9499	-0.4603	-0.2711
	(0.6195)	(0.6071)	(0.9178)	(1.1467)	(0.6360)	(0.6310)	(0.7484)	(0.9675)
Observations	8641	8641	2520	2520	6990	6990	2246	2246
N. Cross Sections	962	962	215	215	767	767	192	192
Sargan Test (+)	179.8	147.8	101.6	87.7	161.6	139.4	102.6	87.8
Sargan Test - P. value	0.000	0.000	0.381	0.399	0.000	0.000	0.355	0.395
AR(1) (++)	-11.3	-5.2	-3.8	-2.4	-9.7	-4.3	-3.5	-2.3
AR(1) - P. value	0.000	0.000	0.000	0.019	0.000	0.000	0.001	0.022
AR(2) (+++)	-0.1	1.5	0.3	-0.7	0.3	0.6	0.5	-0.4
AR(2) - P. value	0.919	0.138	0.747	0.496	0.789	0.568	0.624	0.705

Notes: (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Country	**PAR**	**PAR**	**PAR**	**PAR**	**PAR**	**PAR**	**PAR**	**PAR**
Estimator	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**
Sample	**A1**	**A1**	**A2**	**A2**	**M1**	**M1**	**M2**	**M2**
Imports(-1)	0.4313***	0.5264***	0.6233***	0.5593***	0.4182***	0.4963***	0.6355***	0.6751***
	(0.0280)	(0.0950)	(0.0395)	(0.0976)	(0.0298)	(0.1051)	(0.0354)	(0.1434)
Imports(-2)	0.1513***	0.1172***	0.1626***	0.2106***	0.1367***	0.1066**	0.1256***	0.0913
	(0.0231)	(0.0432)	(0.0376)	(0.0668)	(0.0234)	(0.0444)	(0.0363)	(0.0891)
Imports(-3)	0.1072***	0.1064***	0.1253***	0.1452***	0.1145***	0.0997***	0.1593***	0.1293***
	(0.0235)	(0.0271)	(0.0365)	(0.0470)	(0.0239)	(0.0272)	(0.0383)	(0.0464)
rer	0.2060	0.1544	-0.2462	-0.0054	0.7969*	0.6014	0.5319	0.6338
	(0.3674)	(0.3403)	(0.4221)	(0.4477)	(0.4313)	(0.4507)	(0.3907)	(0.4873)
Preference	-0.8827	-0.9294*	-0.9939*	-0.9791*	-0.5880	-0.8158	-0.2915	-0.3965
	(0.5667)	(0.5496)	(0.5673)	(0.5920)	(0.6399)	(0.6690)	(0.4947)	(0.5636)
Observations	6297	6297	2070	2070	5672	5672	1846	1846
N. Cross Sections	746	746	192	192	647	647	170	170
Sargan Test (+)	156.7	127.2	118.1	104.8	144.3	117.3	111.9	95.2
Sargan Test - P. value	0.001	0.009	0.163	0.171	0.006	0.039	0.281	0.388
AR(1) (++)	-11.8	-5.9	-5.3	-3.8	-11.2	-5.4	-5.4	-3.3
AR(1) - P. value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
AR(2) (+++)	0.3	1.2	0.1	-0.4	0.6	1.0	0.2	0.3
AR(2) - P. value	0.730	0.232	0.915	0.713	0.572	0.332	0.854	0.753

Notes: (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Country	**PAR**	**PAR**	**PAR**	**PAR**	**PAR**	**PAR**	**PAR**	**PAR**
Estimator	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**
Sample	**A1**	**A1**	**A2**	**A2**	**M1**	**M1**	**M2**	**M2**
Imports(-1)	0.4248***	0.5044***	0.6144***	0.5410***	0.4120***	0.4683***	0.6310***	0.6378***
	(0.0287)	(0.0957)	(0.0401)	(0.0943)	(0.0300)	(0.1064)	(0.0348)	(0.1444)
Imports(-2)	0.1450***	0.1182***	0.1544***	0.2048***	0.1285***	0.1109**	0.1211***	0.0978
	(0.0232)	(0.0429)	(0.0370)	(0.0646)	(0.0233)	(0.0444)	(0.0359)	(0.0864)
Imports(-3)	0.1047***	0.1055***	0.1239***	0.1362***	0.1094***	0.0976***	0.1534***	0.1204***
	(0.0235)	(0.0271)	(0.0352)	(0.0459)	(0.0240)	(0.0271)	(0.0309)	(0.0452)
rer	0.1814	0.1380	-0.2440	0.0208	0.6853	0.5280	0.4780	0.6921
	(0.3628)	(0.3399)	(0.4406)	(0.4680)	(0.4276)	(0.4472)	(0.4068)	(0.5004)
Preference x dg_1								
Preference x dg_2	-3.7622***	-3.2947***	-2.3039***	-2.2539**	-3.4307***	-3.2717***	-1.2144	-1.7129
	(0.8362)	(0.9294)	(0.8111)	(1.0678)	(0.9456)	(1.0937)	(0.7396)	(1.3118)
Preference x dg_3	-0.3245	-0.4993	-0.6856	-0.8368	-0.1877	-0.4355	-0.1793	-0.3278
	(0.5745)	(0.5450)	(0.6105)	(0.6491)	(0.6542)	(0.6787)	(0.5391)	(0.6417)
Observations	6297	6297	2070	2070	5672	5672	1846	1846
N. Cross Sections	746	746	192	192	647	647	170	170
Sargan Test (+)	156.6	126.5	119.0	104.0	142.3	116.8	111.9	95.3
Sargan Test - P. value	0.001	0.010	0.149	0.184	0.008	0.041	0.281	0.387
AR(1) (++)	-11.8	-5.8	-5.4	-3.9	-11.3	-5.2	-5.4	-3.3
AR(1) - P. value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
AR(2) (+++)	0.4	1.0	0.2	-0.4	0.6	0.7	0.2	0.2
AR(2) - P. value	0.697	0.295	0.879	0.667	0.546	0.464	0.865	0.867

Notes: (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Country	**URU**	**URU**	**URU**	**URU**	**URU**	**URU**	**URU**	**URU**
Estimator	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**
Sample	**A1**	**A1**	**A2**	**A2**	**M1**	**M1**	**M2**	**M2**
Imports(-1)	0.4906***	0.6393***	0.6759***	0.5792***	0.4681***	0.3030**	0.6536***	0.7519***
	(0.0269)	(0.1875)	(0.0356)	(0.1713)	(0.0316)	(0.1531)	(0.0437)	(0.2874)
Imports(-2)	0.0820***	-0.0006	0.0761**	0.1140	0.1101***	0.1545**	0.0782**	-0.0025
	(0.0198)	(0.0869)	(0.0319)	(0.1389)	(0.0203)	(0.0642)	(0.0322)	(0.2145)
rer	0.4138*	0.4290*	-0.5280*	-0.5613*	0.6360**	0.7989**	-0.3399	-0.3614
	(0.2324)	(0.2428)	(0.3187)	(0.3366)	(0.2587)	(0.3143)	(0.3514)	(0.3658)
Preference	-0.4903	-0.3995	-1.8699***	-1.9891***	-0.8181*	-1.0802*	-1.8981***	-1.7342*
	(0.4835)	(0.4305)	(0.6164)	(0.7044)	(0.4960)	(0.6302)	(0.7247)	(0.9296)
Observations	8185	8185	2319	2319	6951	6951	2054	2054
N. Cross Sections	960	960	233	233	793	793	206	206
Sargan Test (+)	74.8	74.3	83.8	72.7	73.4	69.0	79.6	77.0
Sargan Test - P. value	0.356	0.102	0.142	0.126	0.399	0.199	0.227	0.069
AR(1) (++)	-13.1	-3.5	-5.7	-2.3	-11.6	-2.8	-5.2	-1.9
AR(1) - P. value	0.000	0.000	0.000	0.019	0.000	0.006	0.000	0.062
AR(2) (+++)	0.7	1.1	0.3	-0.2	1.4	-0.5	0.7	0.5
AR(2) - P. value	0.487	0.269	0.741	0.857	0.156	0.645	0.482	0.610

Notes: (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Country	**URU**	**URU**	**URU**	**URU**	**URU**	**URU**	**URU**	**URU**
Estimator	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**	**BB (1)**	**BB (2)**
Sample	**A1**	**A1**	**A2**	**A2**	**M1**	**M1**	**M2**	**M2**
Imports(-1)	0.4993***	0.6442***	0.6723***	0.5265***	0.4843***	0.3700***	0.6559***	0.6711**
	(0.0259)	(0.1715)	(0.0327)	(0.1589)	(0.0298)	(0.1424)	(0.0395)	(0.2621)
Imports(-2)	0.0863***	0.0066	0.0721**	0.1465	0.1171***	0.1460**	0.0755**	0.0535
	(0.0195)	(0.0838)	(0.0309)	(0.1272)	(0.0199)	(0.0640)	(0.0319)	(0.1986)
rer	0.2917	0.3169	-0.6231*	-0.6866*	0.4791*	0.5813**	-0.4066	-0.4830
	(0.2279)	(0.2250)	(0.3250)	(0.3499)	(0.2507)	(0.2910)	(0.3415)	(0.3536)
Preference x dg_1	-0.9051	-1.0814	-4.9711***	-5.7887***	-1.8682	-2.5864	-6.0054***	-6.2333***
	(2.5222)	(2.3136)	(1.3698)	(1.5105)	(3.3836)	(3.5456)	(1.5422)	(2.2920)
Preference x dg_2	-3.7854***	-3.1622***	-4.2454***	-4.6833***	-3.9456***	-4.9016***	-4.2964***	-4.3018***
	(0.7025)	(1.0289)	(0.9463)	(1.0919)	(0.7695)	(1.1412)	(1.1665)	(1.6204)
Preference x dg_3	-0.0132	-0.0226	-1.5678***	-1.6295**	-0.3814	-0.5478	-1.7997***	-1.9474**
	(0.4721)	(0.4175)	(0.5737)	(0.6784)	(0.4777)	(0.5760)	(0.6594)	(0.8370)
Observations	8185	8185	2319	2319	6951	6951	2054	2054
N. Cross Sections	960	960	233	233	793	793	206	206
Sargan Test (+)	72.2	72.7	83.1	71.4	73.5	70.1	77.4	73.3
Sargan Test - P. value	0.437	0.126	0.155	0.149	0.398	0.176	0.283	0.117
AR(1) (++)	-13.2	-3.8	-5.7	-2.3	-11.8	-3.2	-5.2	-1.8
AR(1) - P. value	0.000	0.000	0.000	0.019	0.000	0.001	0.000	0.068
AR(2) (+++)	0.6	1.1	0.4	-0.4	1.4	-0.2	0.8	0.3
AR(2) - P. value	0.525	0.260	0.701	0.656	0.176	0.856	0.446	0.775

Notes: (1): using all available lags as instruments. (2): first available lag not used as instrument. (+): Sargan Test for the validity of the set of instruments. (++): Arellano-Bond test for first order serial correlation in first differences (Ho: no autocorrelation). (+++): Arellano-Bond for test second order serial correlation in first differences (Ho: no autocorrelation). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.