Border Effects in the Atlantic Triangle

Thierry Mayer [a] *and Soledad Zignago* [b]

[a] *Université de Paris XI, CEPII, CERAS, and CEPR.* [b] *CEPII and TEAM, Université de Paris I.*

Summary

We investigate trade integration between members of the European Union (EU), the North American Free Trade Area (NAFTA) and the Southern Common Market (MERCOSUR). The paper evaluates the ease of access to each of those markets from each other based on a benchmark consisting of trade within countries. This methodology, often labeled border effects, furnishes a new tool for the estimation of regional integration and market access in general. This is used here in particular to assess the access to Northern markets of Southern producers, a very sensitive question in the prospect of the new World Trade Organization (WTO) round negotiations. We concentrate on the evaluation of access of certain MERCOSUR countries' exporters (Brazil, Argentina and Uruguay), to the EU and NAFTA markets. Building on those estimates, prospects can be made about possible future schemes of integration between MERCOSUR countries and the two large industrialized and integrated zones of this Atlantic Triangle. We evaluate in particular the possible trade effects of free trade agreements between MERCOSUR and the EU and MERCOSUR and NAFTA respectively. We explore then some possible explanations of border effects like tariffs, non-tariff barriers and bilateral foreign direct investment (FDI) stocks, an important topic in the south of Latin America.

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I. Introduction

The proliferation of new regional trading arrangements and deepening of existing integration experiences is probably one of the main phenomenon that has characterized the global trade environment in the last decade. The most important manifestations of this trend have been the formation of the North American Free Trade Agreement (NAFTA) and

the Southern Common Market (MERCOSUR) at the beginning of the nineties, almost in conjunction with the completion of a major integration phase in Western Europe (the Single Market Programme achieved in 1993) and the enlargement of the European Union (EU) to three new member countries in 1995.

Those three groups of countries (NAFTA, MERCOSUR and the EU) enjoy relatively free movement of goods (with nevertheless important differences in the degree of trade integration) inside each group, while maintaining non-negligible barriers to trade between themselves. As the experience of the multilateral trade negotiations held in Cancun in September 2003 has shown, those three groups are key players in trade liberalization talks, with sometimes conflicting interests. Those events might even be interpreted as a confirmation of fears expressed by part of the economists' profession that the multiplication of regional arrangements would result in the formation of regional "blocks", deepening their internal integration, while making global trade talks increasingly difficult and slow.

This paper mostly tries to give a rigorous description of the level of integration within and between each of the three "blocks" forming the Atlantic Triangle, an expression sometimes used to refer to their common geographic feature of access to the Atlantic Ocean. The paper evaluates the ease of access to each of those markets from each other based on a benchmark consisting of trade within countries. This border effects methodology, furnishes a new tool for the estimation of regional integration and market access in general. This is used here in particular to assess the access to Northern markets of Southern producers (MERCOSUR exporters' access to NAFTA and EU markets here), a very sensitive question in the prospect of the new WTO-development-round negotiations, initiated in Doha in 2001.

Three important trade liberalization negotiations are entering into a new and crucial phase for the MERCOSUR: The EU-MERCOSUR Association Agreement, the Free Trade Area of the Americas (FTAA) and the Doha Round of the WTO. This paper is part of a larger literature attempting to provide negotiators with rigorous tools of analysis. It complements in particular a literature trying to assess trade effects of "North-South" free trade agreements between MERCOSUR and the EU and MERCOSUR and NAFTA.

Most of those studies are based on computable general equilibrium (CGE) models and show that in the area of trade in goods, simultaneous preferential trade negotiations have the potential to provide significant market access gains, as a result of the fact that the structure of protection in the US and the EU is strongly biased against sectors and products where MERCOSUR countries have clear comparative advantages.[1] Clearly, a large determinant of the size and sharing of potential benefits from the prospective agreements depend upon the degree of inclusion of agricultural products in the negotiations. We will here however focus on market access measurement for manufacturing industries. This is a sensitive and important topic on several grounds. It relates in particular to the traditional arguments about the necessary protection of infant industries in developing countries. Because of EU apparent competitive position in those countries (Castilho [2003] shows that the EU accounts for around 28% of MERCOSUR's imports despite MERCOSUR's high protection in manufactured goods), trade liberalization agreements of the North-South type is sometimes thought to represent an important threat to local production. We provide here a detailed empirical account of the measured market access for different industries in those North-South trade relationships.

The remainder of this paper consists of four sections. Section II presents the border effects methodology. An assessment of the effects of regional integration on trade

flows is given in Section III. Section IV gives global and industry-level estimates of reciprocal market access between the three regional blocks studied here and furnishes insights about the possible explanations of the estimated border effects, trying in particular to evaluate which share of market access difficulties can be attributed to the level of remaining bilateral tariffs between the blocks.

II. Measuring International Market Openness with Border Effects

The Model and Estimable Equation

The measure of the degree of international fragmentation of market is by nature linked to the assessment of the impact of national borders. For that assessment, a model of bilateral trade flows is needed to describe what a "normal" trade flow should be. The gravity equation is the ideal candidate for this comparison thanks to its old empirical success in describing bilateral trade volumes. This methodology of adding intra-national trade flows to a classical trade equation in order to measure the impact of national borders was the motivation behind the seminal work of McCallum [1995] soon followed by the application and extension of the framework by Wei [1996] for the cases where data on trade flows between sub-national regions do not exist. Indeed, even in the absence of flows between sub-national regions, you can still measure the total volume of trade occurring within a country. This is simply equal to the overall production of the country minus its total exports, which gives the total value of goods shipped from a country to its own consumers. Inserting this observation in a bilateral trade equation, the researcher can contrast internal flows with international flows. Everything else equal, the excessive trade observed inside a country provides an estimate of the fragmentation of international markets.

We use the same modeling strategy as in Fontagné, Mayer and Zignago [2004], that is a specific form of the Krugman [1980] model of monopolistic competition and trade in an -country setting, which yield very simple estimable predictions for trade volumes directly extracted from theory:

$$\begin{aligned}\ln(\text{relflow}_{ij}) = {} & \beta_1 \ln(\text{relprod}_{ij}) + \beta_2 \ln(\text{relprice}_{ij}) + \beta_3 \ln(\text{reldis}_{ij}) + \beta_4 C_{ij} + \beta_5 L_{ij} \\ & - (\sigma-1)\ln(1 + \text{tar}_{ij}) - (\sigma-1)\ln(1 + \text{ntb}_{ij}) + \beta_7 \text{RIA}_{ij} \\ & + \beta_0 + \varepsilon_{ij}.\end{aligned} \tag{1}$$

Most variables are expressed in relative terms: relflow_{ij} gives the imports of *j* from *i* relative to imports from self of country *j*, reldis_{ij} is the corresponding ratio for distances. relprod_{ij} relates the value of output of *i* over *j* , while relprice_{ij} gives the ratio of producers' prices.

While relative distances proxy for transport costs, the estimated equations also includes "borders-related costs", which in the more general case can consist of tariffs (tar_{ij}) or broadly defined Non Tariff Barriers (ntb_{ij}, quantitative restrictions, administrative burden, sanitary measures...). We account for the reduction in trade barriers due to Regional Integration Arrangements, RIA_{ij}. Sharing a common language (L_{ij} equals to 1) and a common border (C_{ij} equals to 1) is also assumed to mitigate trade barriers. The remaining impact of crossing national borders is estimated through the intercept of the equation, β_o, which gives the remaining level of excessive intra-national trade, everything else (productions, distances and prices notably) equal. This estimate incorporates all remaining border-related hindrances to international commerce, such as home bias in consumption, the effect of

holding different currencies, or unmeasured protectionist instruments. We estimate several versions of (1) below, some of which imposing the theoretically consistent constraint that the coefficient on relative production should be unitary, some considering reciprocity issues.

Data Requirements

We estimate equation (1) in order to capture border effects characterizing each of the possible bilateral combinations of trade partners in the Atlantic Triangle. The needed data involves primarily bilateral trade and production figures in a compatible industry classification. Those come from the Trade and Production 1976-1999 database made available by Alessandro Nicita and Marcelo Olarreaga at the World Bank, which compiles this data for 67 developing and developed countries at the ISIC rev2 3-digit industry level over the period 1976-1999. The original data comes principally from United Nations sources, the COMTRADE database for trade and UNIDO industrial statistics for the production. The World Bank files have a lot of missing values for production figures in recent years. We have largely extended the database on this aspect using more recent versions of the UNIDO CD-ROM together with OECD STAN data and BACI, the harmonized disaggregated trade database constructed by Guillaume Gaulier and Soledad Zignago.[2] We end up with rather complete data in our sample for 26 ISIC 3-digit industries.[3]

As can be seen in equation (1), we need measures of distances between and within countries for the countries in the sample. We developed a new database of internal and external distances,[4] which uses city-level data in the calculation of the distance matrix to assess the geographic distribution of population inside each nation. The database also contains other geographical variables used here, like common language and contiguity.

Tariffs can be measured at the bilateral level and for each product of the HS6 nomenclature in the TRAINS database from UNCTAD. Those tariffs are aggregated from TRAINS data treated by Jon Haveman[5] in order to match our ISIC rev2 industry classification using the world imports as weights for HS6 products, an extract of the data for 1999 is shown in Table 1. Even in manufactured goods, tariffs are not negligible and (important for our empirical work below) vary quite substantially across industries and countries combinations. Non-tariff barriers (NTBs) data also come from Haveman's treatment of TRAINS.

III. The Impact of Regional Agreements in the Atlantic Triangle

Among the objectives of this section, we first wish to compare the respective impacts of MERCOSUR, EU and NAFTA agreements on trade volumes and intra-regional estimated integration. We also want to compare MERCOSUR's estimates with other regional integrations agreements (RIAs) involving developing countries. In this purpose, we add Association of Southeast Asian Nations (ASEAN) member countries in the sample as well as the Andean Community. We run regressions for different time periods over the whole time frame, with dummy variables capturing the lower (or higher) impact of borders on trade inside each RIA, and thus characterizing the extent of integration of the zone, compared to trade taking place in the rest of the sample.[6] The five RIAs considered have different levels in formal integration, history and duration:

• The EU: Undoubtedly the largest experiment of regional integration in the recent period, characterized by a long-term commitment of member countries to achieve wide-range integration. EU will usually be here EU15 over the whole period.

• NAFTA: A free trade agreement that entered into force between the USA, Canada and Mexico in January 1994. Tariff reductions among member countries were scheduled on a 10/15 years agenda.

• MERCOSUR: A customs union signed in 1991 between Brazil, Argentina, Paraguay and Uruguay but implemented in 1995, with member countries substantially liberalizing their internal trade during the transition period. The common external tariffs (CET) concerned 85% of tariff lines in 1995 and a schedule for convergence towards complete CET and free trade was then agreed upon but significantly disturbed by the macroeconomic problems in Brazil and Argentina.

• ASEAN: Officially a free trade agreement between Indonesia, Malaysia, Singapore, Thailand and the Philippines since 1977, but intrabloc trade liberalization was really implemented on a large scale starting with the Asean Free Trade Area (AFTA) in 1992 (Soloaga and Winters [2001]).

• The Andean Community: A rather old regional trade agreement, but is usually seen as having been less effective in true reductions of the level of protection in those countries.

Table 2 gives results for three different time periods such that we can see the evolution of coefficients over time. Note first that the level of border effects in this world matrix of trade flows is very high: Two countries that do not belong to one of the RIA trade on average 58 times (exp(4.06)) less between themselves than within themselves in 1995-1999. The trend is however clearly one of falling importance of borders over time, which is consistent with a move towards a global integration of industrial products' markets, even outside regional agreements. This can be interpreted as evidence of a trend of global increase of markets' integration.

Let us consider now the effects of various regionalization experiments. For the most recent period, there seems to be a clear ranking of integration with EU countries being the most integrated zone followed by NAFTA and ASEAN. Figure 1 graphs the evolution of border effects coefficients (equal to minus the sum of the border coefficient and the coefficient on the RIA) inside the three RIAs of the Atlantic Triangle and the Andean Community for comparison. This representation offers a richer picture of how market fragmentation is receding in each of those regional arrangements. A striking characteristic is the apparent convergence of integration over time. The EU starts far more integrated than the other zones, but those gradually catch up, mostly NAFTA and MERCOSUR. The timing of the NAFTA effect is insightful. The mid eighties witness the start of a rather sharp increase in the surplus of trade flows inside NAFTA. This seems to correspond to a widely known sequence of trade liberalization in the zone: Mexico unilaterally liberalized trade in 1985, the United States and Canada signed their free trade agreement in 1989, with NAFTA becoming effective in January 1994. The commercial relationships between MERCOSUR members do not seem to exert a significant effect before 1993,[7] which corresponds also to the timing of openness of this region. The evolution of the Andean Community reveals a downward trend of internal fragmentation and seems to follow the more general evolution of border effects at the global level as shown in Table 2.

Those results point to expected and reasonable estimates of the effect of trading arrangements, somehow more reassuring than those of Soloaga and Winters [2001] for instance who find an overall negative and significant impact of EU membership, no significant impact for NAFTA or ASEAN and an extremely important positive impact of MERCOSUR, roughly constant since 1980. ASEAN is found here to have a sizeable impact on trade

volumes, that is growing over time, the order of magnitude of the effect is comparable to what is found in Frankel [1997] and points to the dynamism of international trade in the region. Note that this revealed dynamism might have much less to do with the impact of the agreement per se than with the emergence of new trade linkages inside the region based on the fragmentation of the production process that has developed a great deal recently (see Yi [2003] for an empirical account). Overall, taking the right benchmark to assess regional integration therefore seems crucial. The puzzling results in the previous literature where the deepest integration experiences did not seem to yield consistent important surpluses of trade are here challenged. The border effect methodology gives us a picture, which seems more in line with the priors, with EU and NAFTA having a large impact on trade flows (although it should again be noted that those areas are still far from perfectly integrated even in recent years).

IV. Reciprocal Market Access in the Atlantic Triangle

Overall Results

Regional integration agreements can be associated with important fears in non-member countries. This was the case in the European integration movement (with claims of a construction of a "Fortress Europe" among Japanese and US authorities) but also in the NAFTA and MERCOSUR construction. The main concern is that the withdrawal of remaining barriers to trade between member nations would be made at the expense of restricted access of external trade partners to the enlarged market. Indeed, there are some theoretical foundations to those fears. There is first the traditional optimal tariff argument, which can be used here. A deepening of a RIA level of integration is very similar to a rise of the size of this RIA on the world market. Consequently, the terms of trade gains from increased protection with respect to third countries are higher, which can be the basis for a more restrictive trade policy. However, the process of multilateral negotiations makes it (almost) impossible for WTO members to raise tariffs. The restricted access will therefore have all the chances to take the form of increased NTBs, which are almost impossible to measure accurately directly, but are indirectly detected through a rise in the border effect of third countries. The second possible channel is through the political economy of protection. Regional integration advances represent major shocks of increased openness for member countries. There might be a temptation to alleviate or at least reduce the adjustment costs of such a move by reducing the access of third country products to national markets in the same time. Associated with those adverse effects for countries outside each of the blocks, are important concerns about reciprocity in market access. Those are in particular central in trade talks and negotiations and constitute a frequent cause of trade disputes.

The dataset used here offers a new opportunity to investigate those issues of adverse effects and reciprocity of market access, with a particular focus on the MERCOSUR countries with its two most important partners in the international trading system (the EU and NAFTA). Table 3 gives results of regressions pooled over all industries with dummy variables capturing each of six different possible flows between those three RIAs and three dummy variables concerning intra-RIA flows (first column).[8] We drop the constant of those regressions in order to have the full border effect for each partner combination. The coefficient on relative production stays very stable around 0.9, which is quite near the unitary value predicted by theory.[9] The coefficient on distance is also very comparable with usual findings

in gravity equations. It can be seen that speaking the same language multiplies trade volumes by 1.6 and contiguity by 2, everything else constant, in the first column.

The level of trade integration among members of a RIA seems unmatched in the other combinations considered here over the period. For instance, the 43 (exp(3.76) ≈ 43) figure for intra-MERCOSUR flows compares with 87 for European exports to the MERCOSUR, and 103 for the reciprocal flow. With a factor of 122, MERCOSUR exports to NAFTA member countries appear as the most impeded in our sample, while the EU exports to NAFTA have the lower border effect between RIAs of this sample (49). Lastly, the MERCOSUR access to the EU and NAFTA markets appears less easy than the reverse.

Is it Trade Policy?

The difficulties faced by MERCOSUR exporters in the access to their two major trading partners are not significantly different from each other in column (1). Moreover, we do not know, at this point, which part of the variance of the border effects can be explained by simple differences in tariff rates or NTBs and which part results from other determinants. The other columns of Table 3 consider possible explanations. Returning to our modeling framework, the coefficient on the dummy variable of column (1) in Table 3 (multiplied by -1, for ease of interpretation) MERCOSUR-EU for instance, has a theoretical counterpart of:

$$(\sigma^s-1)[\ln(1+\mathrm{tar}_{ij})+\ln(1+\mathrm{ntb}_{ij})]+\beta_o, \qquad (2)$$

where i= MERCOSUR and j= EU. We want to introduce proxies for terms concerning actual protection in the above expression and measure the resulting fall in the estimated border effect expected if protection actually contributes to explaining border effects.[10] While the coefficient is pooled over all industries, we observe the protection variables for tariffs (t^s_{ij}) and NTBs (ntb^s_{ij}) at the industry level. The remaining estimate of border effect (β_o) includes the above-mentioned potential elements pooled over industries for a given dyad of the Atlantic triangle. Note that the coefficient on tariffs also provides an estimate of $\sigma-1$ in our sample.

Table 3 gives results concerning protection measures inside the Atlantic Triangle, while Table 4 generalizes the sample to incorporate countries outside the Atlantic Triangle. The estimated price elasticity (σ in our theoretical framework) is relatively high (between 2.62 and 4.83, across specifications in both Tables 3 and 4) considering the level of industry detail. This estimate of σ is slightly lower than recent estimates that have been provided in the literature, but we only have 26 industries here, where Head and Ries [2001] for instance estimate their σ around 8 with 106 industries. Second, we observe a decrease in border effects for all dyadic combinations in Table 3. Tariff barriers therefore contribute to the impact of national borders in the expected way: They tend to raise the ratio of internal to cross-border trade volumes, although this ratio remains high and significant, pointing to other important explanations.

Besides tariffs, there are other obstacles to trade imposed by governments at the border in order to protect national industries and that will be captured by the border effects in the above regressions. Those NTBs, for which tariff equivalent are difficult to compute, take a myriad of different forms. Since we use NTBs from Haveman's treatment of TRAINS, we follow here Haveman Nair-Reichert and Thursby [2003] (using the same source data), who divide NTBs into four categories: (1) Those that have direct price effects

such as minimum import pricing, trigger prices, and variable levies, (2) those that involve quantity restrictions such as quotas, seasonal prohibitions, and orderly marketing arrangements, (3) those that involve quality restrictions such as health, safety or technical standards, and (4) those that involve a threat of retaliation such antidumping and countervailing duty investigations. For a given HS6 category, each NTB variable is set equal to 1 if at least one of the underlying tariff lines in that category is subject to a NTB, and 0 otherwise. As for tariffs data, this information on NTBs is then aggregated to match with the 3-digit ISIC rev2 classification by calculating a frequency index. The third column of Table 3 shows that only price NTBs have the expected negative effect on trade flows. On the contrary, the frequency index of quantity NTBs has a positive and significant impact on the determination of trade flows. Whether this comes from poor quality of NTB data of from endogeneity problems with this type of variables (countries imposing trade protection on industries / countries that are particularly performing on their market) is unclear. Note that overall the actual protection explain only a small part of the border effect encountered by MERCOSUR exporters between 1993 and 1999. The part explained is 13% in the access to EU market (exp(4.63)-exp(4.51))/exp(4.51)) and goes up to 20% in the access to NAFTA markets ((exp(4.81)-exp(4.59))/exp(4.81)).

V. What Role for Foreign Direct Investment?

Another possible explanation of border effects that has not been subject to precise testing yet is the importance of foreign direct investment (FDI). It is well known, for instance, that European countries usually import very little volumes of American cars (even those cars that have the size and fuel consumption characteristics that actually make them suitable for European streets and fuel prices). Those "missing imports" can alternatively result from actual protection by EU countries or from a home bias of EU consumers. However, it is also quite likely that the important production of cars taking place within Europe in plants owned by American firms limits the actual "need" for important trade flows. It is also likely that this last explanation is not independent from the two former: The theoretical and empirical literature on FDI/export decision suggests that American firms may have decided to produce on the European soil because of a combination of high trade protection and the imperative adaptation of American cars to local tastes and needs.

We use the bilateral stock of FDI from the Organization for Economic Cooperation and Development (OECD) database, often used in gravity-like empirical work on FDI (Wei [2000] being a recent example), which covers the period 1980 to 2000. Although this variable lacks the industrial dimension, it has the advantage of good overall availability and reliability across the entire period. Column 4 of Table 4 introduces the stock of bilateral FDI. FDI has a positive impact, which represents a confirmation that, at such an aggregate level, FDI and trade are complements rather than substitutes. This limits the validity of the potential explanation of border effects through FDI, although more detailed data at the industry-level would be needed to confirm this result.

In columns 5 and 6 we interact the FDI variable with the five RIAs considered in this work (regression 6 constraint the coefficient on relative production to be unitary). While FDI does not seems to have an important influence on trade flows in direction of the EU or NAFTA, its impact is significant for imports of MERCOSUR, ASEAN and Andean Community. This additional impact is however of opposite sign for ASEAN. Indeed, the

bilateral FDI stock in MERCOSUR has a final coefficient of 0.09 (0.26 - 0.15 in column 5) whereas the stock of FDI in countries of ASEAN has a final coefficient of 0.39 (0.26 + 0.13). This seems to reflect the differences in the motivation of FDI in each RIA: While multinational firms installed in MERCOSUR or Andean Community seem interested in local (or regional) market, those present in ASEAN are turned towards global markets.

VI. Industry-level Market Access in the Atlantic Triangle

We now conduct estimations at the industry level, in order to evaluate the degree of symmetry of revealed trade obstacles in bilateral relationships between MERCOSUR, the EU and NAFTA. Figures 2, 3, and 4 represent bilateral symmetry in market access in the three different combinations over the years 1993-1999. For instance, in Figure 2, the horizontal axis has (the log of) the border effect faced by MERCOSUR exporters on European markets and the vertical axis has (the log of) the border effect faced by European exporters on the MERCOSUR market. In this figure, industries located beneath the 45-degree line are those for which the access to European markets is more difficult than the access to the MERCOSUR market. For each of those figures, results are presented with and without tariffs in the regression. Results are as follows:

First, there is positive correlation between the reciprocal market access of different industries in each country pair. The most apparent correlation being between the EU and NAFTA. This can be interpreted in terms of political economy (similar countries protect their "sensitive" industries in the same way and industries tend to have the same pattern of sensitivity in the two richest blocks). An additional explanation is in terms of industry characteristics (domestic preferences are more diversified in sectors such as food, leading to a larger border effect in all samples for this industry).

Turning to specific industries, we can note that Tobacco, Wood and Leather industries are systematic outliers, characterized by large border effects, in particular in the access to MERCOSUR markets. Here different tastes, transportation issues[11] and other factors related to distribution networks might explain this result. Conversely, machines, instruments and transport equipment, for instance, do face limited border effects in almost all bilateral relationships. Finally, there is an apparent correlation between the border coefficients and the comparative advantage of the region: Professional and scientific instruments industry, for instance, seems largely closer to MERCOSUR exports in Europe and North America than the reverse. Last, including tariffs in the regressions do not seem to change drastically the picture.

VII. Conclusion

We investigate in this paper the impact of regional agreements and, in particular, the ease of reciprocal market access among the EU, NAFTA and MERCOSUR countries. Our method involves an estimation of difficulties encountered by exporters located in one of the blocs when selling their industrial products in another bloc. Those estimates come from a structural gravity-like bilateral trade equation, derived from the now canonical model of trade under monopolistic competition. It is based on a comparison of international trade flows with intra-national trade flows, the border effect method. The level and asymmetry in border effects reveals the market access difficulties in each of the bloc combinations we consider.

Considering the impact of regional agreements, our results point to expected and reasonable estimates: The EU appears as the most integrated region in the sample, followed by NAFTA, ASEAN and MERCOSUR (the Andean Community agreement not seems to have a positive effect in the determination of trade flows).

In the manufacturing sector, the MERCOSUR exporters face more difficulties to access Northern markets than the reverse, but these difficulties are not significantly different in the access to EU than in the access to NAFTA. Distinguishing between alternative explanations of border effects is an important public policy issue in that actual tariffs and other protective devices' cuts can be negotiated in the multilateral arena, whereas differences in tastes are less subject to such negotiations. We find that less than 20% of these border effects can be attributed to actual protection. Other explanations, like product characteristics, must then to be explored. Finally, FDI and trade appear to be complements rather than substitutes. This limits the validity of the potential explanation of border effects through FDI, although more detailed data at the industry-level would be needed to confirm this result.

Notes

[1] See for instance Lacunza, Carrera and Cicowiez [2003] for the effects on MERCOSUR of the prospective FTTA and EU agreements ; Bouët, Laborde, Tarascou and Yapaudjian-Thibaut [2003] for the costs of the FTAA for the EU with and without an agreement with MERCOSUR; Bchir, Decreux and Guérin [2002] for the consequences of a free-trade agreement between the EU and MERCOSUR, or Flôres [2003] for the costs and opportunities of different scenarios for Brazil.

[2] For more details see *http://www.cepii.fr/anglaisgraph/bdd/baci/baci.pdf*.

[3] Concerning the relative price variable, we experimented with relative wages data from UNIDO and consisting of the industry's wage bill divided by the number of employees. We prefer however to run our estimations with a less detailed -but more complete, and maybe less noisy- variable directly capturing relative prices: The price level of GDP expressed relative to the United States. This data comes from the Penn World Tables v.6.1.

[4] Available at *http://www.cepii.fr/anglaisgraph/bdd/distances.htm.*

[5] Available at *http://www.eiit.org/Protection.*

[6] The remaining trade flows are taking place between the RIAs but also with and between countries from the rest of the world.

[7] Production data for Brazil is missing in 1991 and 1992. The estimates for these years should therefore be considered with caution.

[8] This first column restricts the sample to those observations for which tariffs are available to allow the comparison with the second column in the next section.

[9] The last column constraints this coefficient to be 1.

[10] An alternative procedure would use two steps, first estimating border effects coefficients and then regressing them on the possible explanatory variables. However, this involves the undesirable feature of using an econometric estimate as the dependent variable in the second stage. In addition, exploiting the full dimension of the problem would require estimating 9 different border effects for each industry and year, which results in certain regressions having very few observations, and therefore an increased volatility in estimated border effects.

[11] Those results come from industry-level regressions and therefore industry specific coefficients at least partially capture cross-industry differences in "transportability" of the good.

Table 1

TARIFFS IN THE ATLANTIC TRIANGLE
(1999)

	EU			MERCOSUR			NAFTA		
Industry	EU	MS	NT	EU	MS	NT	EU	MS	NT
Apparel	0.00	11.26	11.82	19.84	3.33	19.84	22.05	21.74	3.64
Beverages	0.00	1.04	9.90	18.69	2.56	18.69	16.99	13.23	4.84
Food	0.00	6.84	10.22	12.70	1.41	12.70	16.38	15.05	7.18
Footwear	0.00	8.60	10.60	23.15	6.29	23.15	20.92	20.73	4.50
Furniture	0.00	1.43	1.63	13.99	1.51	13.99	10.79	9.10	1.51
Glass	0.00	4.76	5.17	12.97	1.14	12.97	9.04	7.70	1.98
Ind. Chem.	0.00	3.69	4.85	8.84	0.49	8.84	5.75	4.16	0.74
Iron/steel	0.00	2.16	2.64	10.85	0.78	10.85	5.52	5.19	1.90
Leather	0.00	2.78	4.42	15.51	2.00	15.51	13.06	11.73	2.80
Mach elec	0.00	2.01	2.58	10.91	2.07	10.91	5.68	4.90	0.71
Machines	0.00	1.00	1.14	8.47	2.26	8.47	4.69	4.18	0.57
Metal prod	0.00	2.00	2.39	16.64	2.23	16.64	8.39	7.19	1.53
Misc	0.00	2.33	2.62	16.01	1.58	16.01	8.02	6.97	1.31
Nf metals	0.00	2.32	2.48	6.17	0.15	6.17	3.95	3.45	0.57
Non-metal	0.00	2.04	2.22	9.13	0.46	9.13	8.27	6.99	1.16
Oth Chem.	0.00	1.27	2.09	10.60	0.93	10.60	6.01	4.90	1.28
Paper	0.00	1.85	2.92	11.12	0.90	11.12	4.44	3.98	1.15
Petroleum	0.00	2.26	2.45	2.23	0.12	2.23	6.35	4.08	1.18
Plastic	0.00	3.87	6.85	16.01	1.74	16.01	9.87	7.39	2.61
Pottery	0.00	6.34	6.83	17.17	1.72	17.17	12.38	9.67	1.45
Printing	0.00	1.41	1.52	8.49	1.03	8.49	4.50	3.82	0.14
Prof/Sci	0.00	1.35	1.73	11.79	1.88	11.79	6.06	5.26	0.53
Rubber	0.00	2.88	2.97	12.37	1.34	12.37	8.44	7.66	1.15
Textiles	0.00	8.98	9.46	17.77	2.34	17.77	16.50	16.08	2.85
Tobacco	0.00	35.32	51.69	19.72	4.10	19.72	112.83	30.41	8.56
Transport	0.00	6.41	6.51	15.35	5.92	15.35	8.28	7.84	1.35
Wood	0.00	1.72	1.82	8.62	0.47	8.62	6.65	6.10	1.75

Table 2

BORDER EFFECTS AMONG THE LARGE INTEGRATING REGIONS

	Dependent Variable: Ln Imports Partner/Own		
Model:	1983-1988	1989-1994	1995-1999
Border	-4.83 [a]	-4.85 [a]	-4.06 [a]
	(0.05)	(0.05)	(0.05)
Rel. Production	0.81 [a]	0.81 [a]	0.86 [a]
	(0.01)	(0.01)	(0.01)
Rel. Prices	-0.43 [a]	-0.46 [a]	-0.58 [a]
	(0.02)	(0.02)	(0.02)
Rel.Distance	-0.93 [a]	-0.87 [a]	-1.06 [a]
	(0.02)	(0.02)	(0.02)
Contiguity	0.23 [a]	0.54 [a]	0.60 [a]
	(0.04)	(0.03)	(0.03)
Common Language	0.32 [a]	0.51 [a]	0.53 [a]
	(0.02)	(0.02)	(0.02)
MERCOSUR	0.14	0.33 [a]	0.83 [a]
	(0.11)	(0.12)	(0.10)
EU15	1.66 [a]	1.88 [a]	1.63 [a]
	(0.03)	(0.03)	(0.04)
NAFTA	0.62 [a]	1.20 [a]	1.23 [a]
	(0.09)	(0.08)	(0.09)
ASEAN	0.47 [a]	1.09 [a]	1.20 [a]
	(0.10)	(0.08)	(0.11)
Andean Community	-1.47 [a]	-1.02 [a]	-0.32 [a]
	(0.08)	(0.07)	(0.08)
N	246188	343770	318713
R^2	0.436	0.432	0.477
RMSE	2.83	2.814	2.745

Note: Standard errors in parentheses: [a], [b] and [c] represent respectively statistical significance at the 1%, 5% and 10% levels. The reported standard errors take into account the correlation of the error terms for a given importer.

Table 3

BORDER EFFECTS BETWEEN MERCOSUR, EUROPEAN UNION AND NAFTA COUNTRIES
(1993-1999)

	Dependent Variable: Ln Imports Partner/Own				
Model:	(1)	(2)	(4)	(5)	(6)
Rel. Production	0.92 [a]	0.92 [a]	0.92 [a]	0.81 [a]	1
	(0.04)	(0.04)	(0.04)	(0.03)	
Rel. Prices	-1.01 [a]	-0.97 [a]	-0.94 [a]	-1.35 [a]	-1.66 [a]
	(0.31)	(0.30)	(0.30)	(0.28)	(0.32)
Rel.Distance	-0.83 [a]	-0.83 [a]	-0.84 [a]	-0.46 [a]	-0.80 [a]
	(0.09)	(0.09)	(0.10)	(0.15)	(0.17)
Contiguity	0.67 [a]	0.67 [a]	0.65 [a]	0.59 [a]	0.33 [c]
	(0.17)	(0.17)	(0.17)	(0.14)	(0.18)
Common Language	0.49 [a]	0.48 [a]	0.48 [a]	0.20	0.25
	(0.16)	(0.16)	(0.17)	(0.16)	(0.24)
EU15	-2.79 [a]	-2.78 [a]	-2.76 [a]	-4.95 [a]	-3.81 [a]
	(0.25)	(0.25)	(0.25)	(0.43)	(0.49)
NAFTA	-3.04 [a]	-2.98 [a]	-2.90 [a]	-5.05 [a]	-4.04 [a]
	(0.46)	(0.46)	(0.48)	(0.48)	(0.58)
MERCOSUR	-3.76 [a]	-3.63 [a]	-3.70 [a]		
	(0.36)	(0.36)	(0.32)		
EU15 --> MERCOSUR	-4.47 [a]	-4.28 [a]	-4.33 [a]	-6.42 [a]	-5.06 [a]
	(0.40)	(0.41)	(0.38)	(0.47)	(0.53)
MERCOSUR --> EU15	-4.63 [a]	-4.53 [a]	-4.51 [a]	-6.61 [a]	-5.11 [a]
	(0.46)	(0.46)	(0.48)	(0.69)	(0.80)
NAFTA --> MERCOSUR	-4.57 [a]	-4.37 [a]	-4.41 [a]	-6.84 [a]	-5.70 [a]
	(0.40)	(0.40)	(0.37)	(0.50)	(0.58)
MERCOSUR --> NAFTA	-4.81 [a]	-4.69 [a]	-4.59 [a]	-6.08 [a]	-5.02 [a]
	(0.60)	(0.62)	(0.61)	(0.57)	(0.60)
EU15 --> NAFTA	-3.90 [a]	-3.77 [a]	-3.70 [a]	-5.73 [a]	-4.40 [a]
	(0.47)	(0.48)	(0.49)	(0.44)	(0.51)
NAFTA --> EU15	-4.04 [a]	-3.91 [a]	-3.89 [a]	-6.38 [a]	-5.03 [a]
	(0.48)	(0.48)	(0.50)	(0.73)	(0.87)
Ln (1 + Tariff)		-1.62 [a]	-1.70 [a]	-2.19 [a]	-2.27 [a]
		(0.60)	(0.61)	(0.65)	(0.65)
Threat NTB			0.34	0.23	0.33
			(0.25)	(0.29)	(0.31)
Price NTB			-0.57 [b]	-0.82 [a]	-0.80 [a]
			(0.27)	(0.19)	(0.27)
Quantity NTB			0.57 [b]	-0.10	-0.07
			(0.27)	(0.29)	(0.33)
Quality NTB			0.02	-0.12	-0.12
			(0.22)	(0.25)	(0.25)
Ln bilateral FDI stock				0.22 [a]	0.16 [a]
				(0.03)	(0.03)
N	32290	32290	29041	19689	19689
R^2	0.907	0.907	0.906	0.911	0.895
RMSE	1.942	1.939	1.926	1.709	1.737

Note: Standard errors in parentheses: [a], [b] and [c] represent respectively statistical significance at the 1%, 5% and 10% levels. The reported standard errors take into account the correlation of the error terms for a given importer.

Table 4

Border Effects and FDI in Regional Agreements

	Dependent Variable: Ln Imports Partner/Own					
Model :	(1)	(2)	(3)	(4)	(5)	(6)
Border	-4.79 [a]	-4.25 [a]	-3.77 [a]	-5.89 [a]	-5.74 [a]	-4.91 [a]
	(0.05)	(0.05)	(0.05)	(0.07)	(0.07)	(0.06)
Ln Rel. Production	0.83 [a]	0.84 [a]	1	0.76 [a]	0.75 [a]	1
	(0.01)	(0.01)		(0.01)	(0.01)	
Ln Rel. Prices	-0.49 [a]	-0.24 [a]	-0.57 [a]	-0.64 [a]	-0.72 [a]	-1.02 [a]
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Ln Rel. Distance	-0.82 [a]	-0.83 [a]	-0.97 [a]	-0.45 [a]	-0.52 [a]	-0.74 [a]
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Contiguity	0.77 [a]	0.78 [a]	0.55 [a]	0.91 [a]	0.78 [a]	0.51 [a]
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
Common Language	0.61 [a]	0.65 [a]	0.71 [a]	0.37 [a]	0.35 [a]	0.42 [a]
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
EU15	1.92 [a]	1.39 [a]	1.29 [a]	0.77 [a]	0.79 [a]	0.64 [a]
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
NAFTA	1.57 [a]	1.20 [a]	1.01 [a]	0.42 [a]	0.66 [a]	0.26 [a]
	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)	(0.07)
MERCOSUR	0.86 [a]	0.70 [a]	0.70 [a]			
	(0.13)	(0.13)	(0.13)			
ASEAN	1.32 [a]	1.60 [a]	1.46 [a]			
	(0.10)	(0.10)	(0.09)			
Andean Community	-0.30 [a]	-0.33 [a]	-0.47 [a]			
	(0.10)	(0.10)	(0.10)			
Ln (1 + tariff)		-5.21 [a]	-5.24 [a]	-3.41 [a]	-3.44 [a]	-3.63 [a]
		(0.29)	(0.30)	(0.24)	(0.24)	(0.25)
Ln bil. FDI stock				0.23 [a]	0.26 [a]	0.20 [a]
				(0.00)	(0.01)	(0.01)
Ln bil. FDI stock * EU					-0.03 [a]	0.00
					(0.01)	(0.01)
Ln bil. FDI stock * NAFTA					-0.06 [a]	-0.01
					(0.01)	(0.01)
Ln bil. FDI stock * MERCOSUR					-0.15 [a]	-0.13 [a]
					(0.02)	(0.02)
Ln bil. FDI stock * ASEAN					0.13 [a]	0.14 [a]
					(0.01)	(0.01)
Ln bil. FDI stock * Andean Comm.					-0.13 [a]	-0.19 [a]
					(0.02)	(0.02)
N	234539	234539	234539	76183	76183	76183
R^2	0.467	0.488	0.308	0.498	0.507	0.371
RMSE	2.69	2.636	2.667	2.068	2.048	2.104

Note: Standard errors in parentheses: [a], [b] and [c] represent respectively statistical significance at the 1%, 5% and 10% levels. The reported standard errors take into account the correlation of the error terms for a given importer.

Figure 1

BORDER EFFECTS OVER TIME IN LARGE RIAS OF AMERICA AND EUROPE

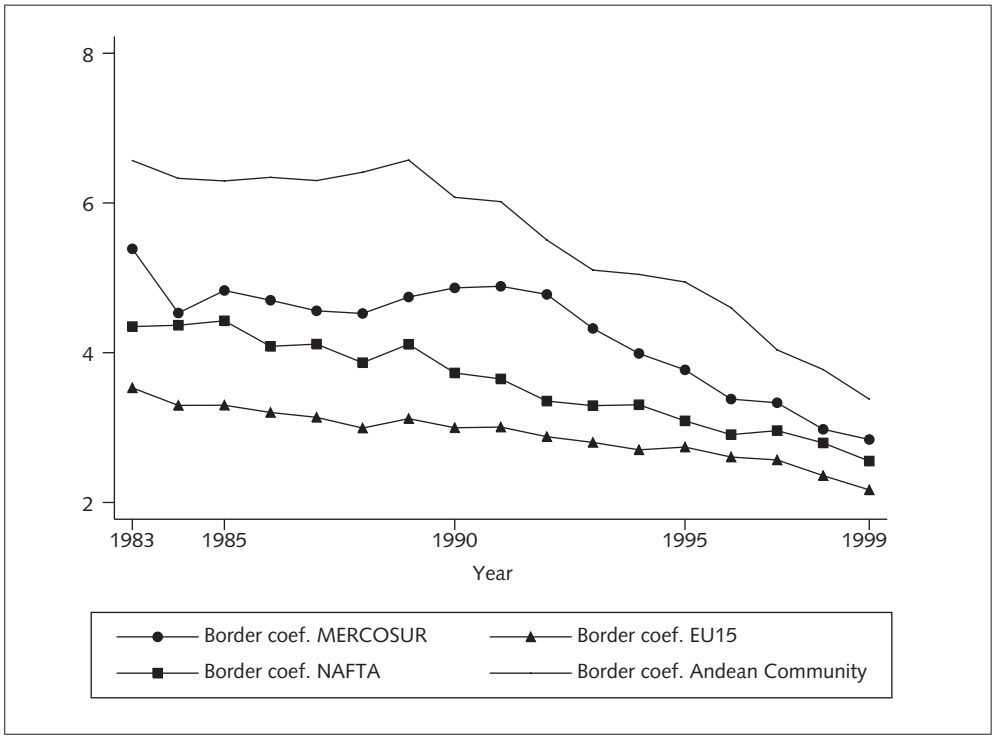


Figure 2

INDUSTRY-LEVEL MARKET ACCESS BETWEEN MERCOSUR AND THE EU15 - BORDER COEFFICIENTS (1993-1999)

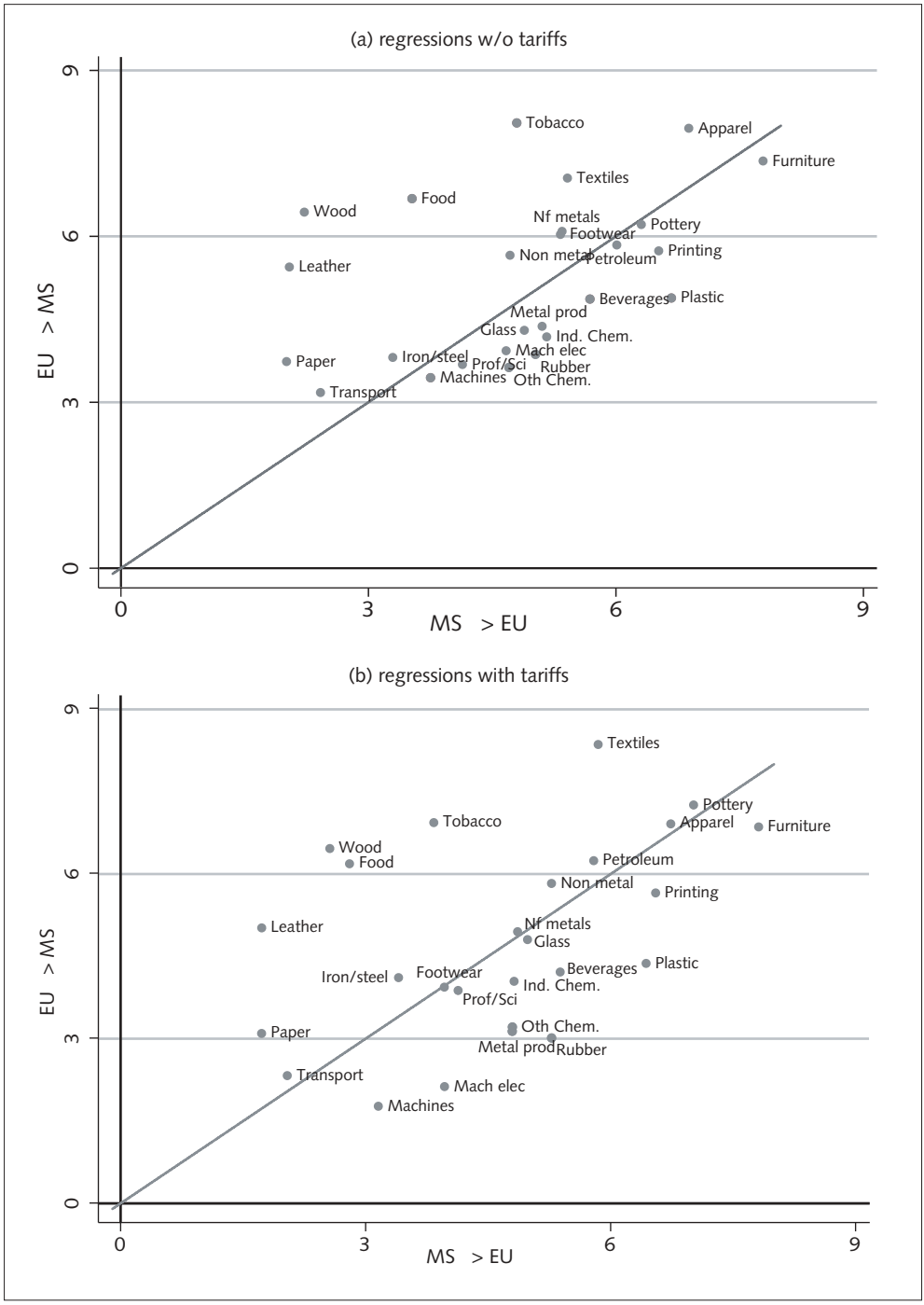


Figure 3

INDUSTRY-LEVEL MARKET ACCESS BETWEEN MERCOSUR AND THE NAFTA - BORDER COEFFICIENTS (1993-1999)

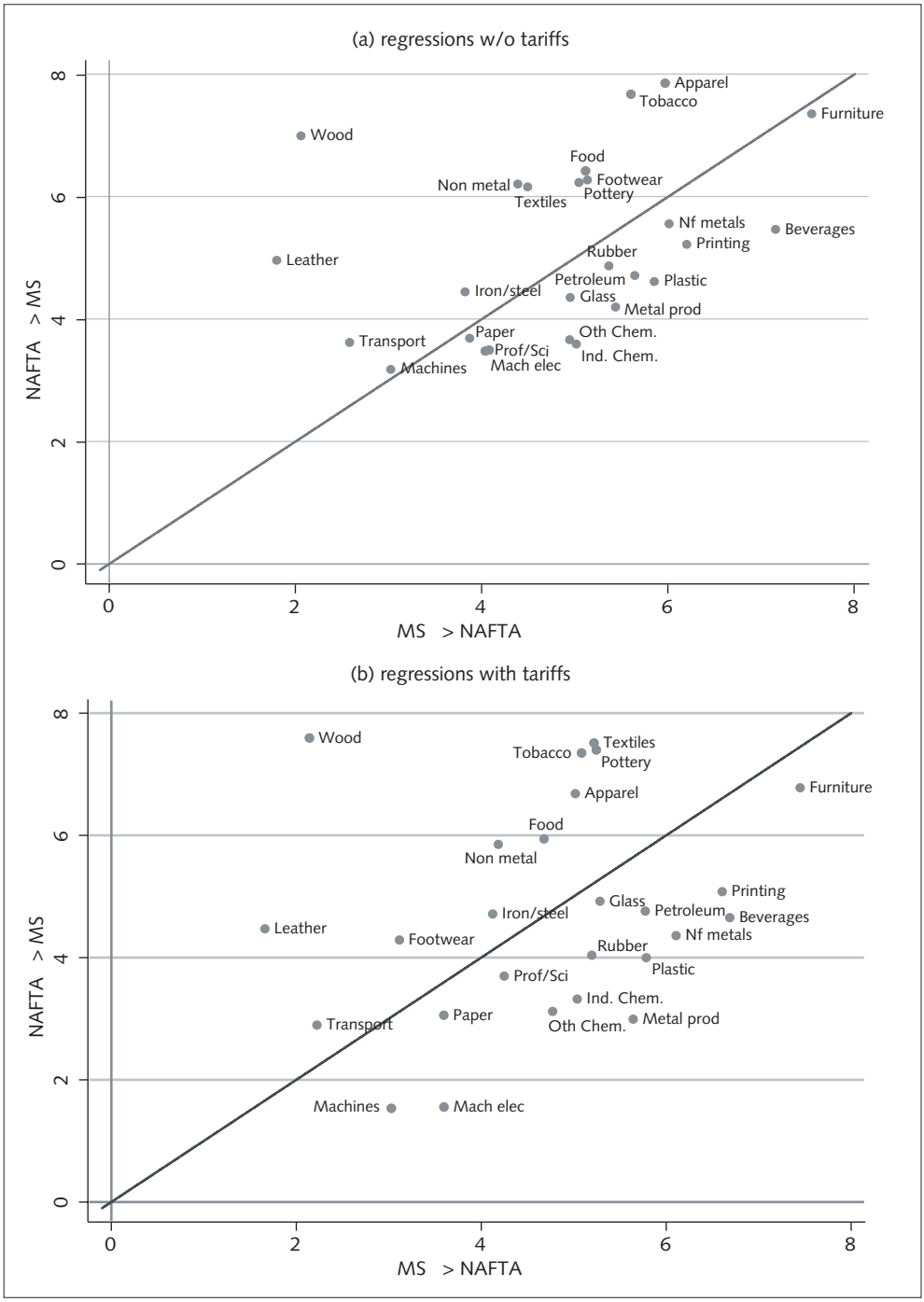
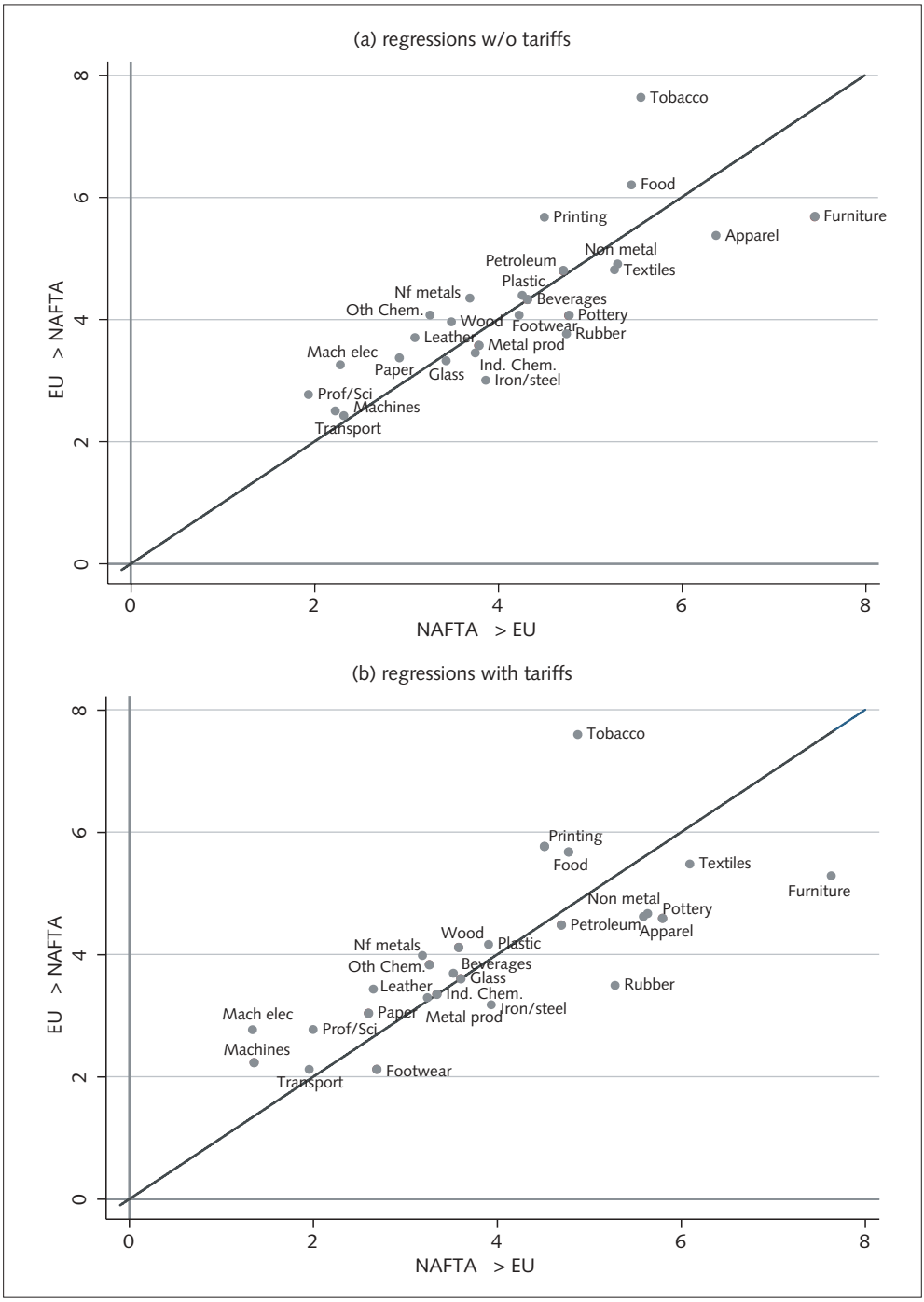


Figure 4

INDUSTRY-LEVEL MARKET ACCESS BETWEEN THE EU6 AND NAFTA - BORDER COEFFICIENTS (1993-1999)



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