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PREFERENTIAL LIBERALIZATION, ANTIDUMPING, AND SAFEGUARDS: STUMBLING BLOCK EVIDENCE FROM MERCOSUR

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There is not yet consensus in the trade agreements literature as to whether preferential liberalization leads to more or less multilateral liberalization. However, research thus far has focused mostly on tariff measures of import protection. We develop more comprehensive measures of trade policy that include the temporary trade barrier (TTB) policies of antidumping and safeguards; studies in other contexts have also shown how these policies can erode some of the trade liberalization gains that arise when examining tariffs alone. We examine the experiences of Argentina and Brazil during the formation of the MERCOSUR over 1990–2001, and we find that an exclusive focus on applied tariffs may lead to a mischaracterization of the relationship between preferential liberalization and liberalization toward non-member countries. First, any "building block" evidence that arises by focusing on tariffs during the period in which MERCOSUR was only a free trade area can disappear once we also include changes in import protection that arise through TTBs. Furthermore, there is also evidence of a "stumbling block" effect of preferential tariff liberalization for the period in which MERCOSUR became a customs union, and this result tends to strengthen upon inclusion of TTBs. Finally, we also provide a first empirical examination of whether market power motives can help explain the patterns of changes to import protection that are observed in these settings.

1. INTRODUCTION

There is a well-established theoretical literature examining the nexus between preferential trading arrangements and multilateral liberalization. Depending on the underlying model, however, theory predicts that preferential liberalization could act as either a stumbling block or a building block to further multilateral liberalization.[1] Beginning in the mid-2000s, empiricists began to provide empirical evidence of the relationships for whether preferential tariff cuts are building blocks or stumbling blocks to subsequent most-favored nation (MFN) liberalization; nevertheless, even this evidence has left us with a number of puzzles.

The first puzzle is that some environments have identified clear evidence of stumbling block relationships arising in the data, whereas others found evidence of building block effects. The major evidence of stumbling block effects, includes Limão (2006) and Karacaovali and Limão (2008) for the effect on Uruguay Round negotiated tariffs for the United States and European Union, respectively, whereas Estevadeordal et al. (2008) find evidence of a building block effect for the free trade areas arising for 10 Latin American economies covering 1990–2001.[2] The empirical answer as to whether preferential

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[1]Theoretical surveys include Baldwin and Venables (1995) and Panagariya (2000).

[2]See also Tovar (2012) for Central American Free Trade Agreement (CAFTA) countries; Calvo-Pardo et al. (2011) for ASEAN; Ketterer et al. (2015) for Japan; and Ketterer et al. (2014) and Mai and Stoyanov (2015) for Canada.

liberalization leads to multilateral liberalization is thus still substantially unsettled.[3] The natural question that arises is what is the explanation for the differences in the results?

A secondary puzzle that arises from the rich, cross-country setting for Latin America, is that Estevadeordal et al. (2008) are also able to empirically capture variation arising across different types of preferential trading arrangements. In particular, their building block result is robust across the Latin American countries involved in free trade areas, but there is no evidence of a building block result for the Latin American countries that go "beyond" the free trade area to adopt a common external tariff and ultimately form a customs union.

This latter result is arguably important for a number of other reasons, many of which are tied to the fact that Argentina and Brazil are two of the main countries that are likely driving this particular result, through their ultimate formation of the MERCOSUR customs union. First, these are two of the largest economies in Latin America. Second, unlike a number of the other countries in Latin America whose trade liberalization efforts ultimately continued well beyond the Estevadeordal et al. (2008) sample period and into the 2000s, trade liberalization for Argentina and Brazil has largely stalled out – i.e., the levels of MFN tariffs that each applies in 2014 are roughly what they applied in 1995. Third, a previously unexplored feature of the experience for Argentina and Brazil is that each also started using the TTB policies of antidumping and safeguards with greater regularity in the early 1990s, alongside their initial steps toward tariff liberalization. Fourth and finally, as a customs union in which the two countries share a common external MFN tariff toward outsiders, there may be separate and distinct market power motives contributing to the differential experience from that taking place under free trade areas.

The purpose of our paper is to utilize the richness provided by the Argentine and Brazilian trade policy environment under MERCOSUR so as to formally and empirically investigate these questions, a number of which are being addressed for the first time. We augment the approach of the existing literature by expanding along two additional dimensions. First, we develop measures of import protection that are more expansive than applied tariffs, as we also take into consideration use of the discretionary policy instruments of temporary trade barriers (TTBs) that other studies have shown can erode the trade liberalization gains appearing to arise through an examination of tariffs alone.[4] Second, to our knowledge, we also provide the first empirical examination of whether market power motives can be used to explain the patterns of changes to import protection that are observed in this setting.[5]

Our approach focuses on Argentina and Brazil during the 1990–2001 period, two of the key countries underlying the Estevadeordal et al. (2008) study. This setting is appropriate for our approach for a number of different reasons. First, by focusing on two countries, we are able to control for many of the various institutional differences that might also be

[3]Recent surveys include Freund and Ornelas (2010) and Limão (forthcoming).

[4]For example, Bown and Tovar (2011) find that much of the MFN tariff liberalization that India overtook during its unilateral liberalization of the 1990s was offset by the early 2000s through their re-application of import protection through a built-up stock of antidumping and safeguards import restrictions.

[5]In related work on the Latin American countries in the Estevadeordal et al. (2008) study, Crivelli (2014) examines how differences in initial levels of external protection captured by applied MFN tariffs explain external liberalization after formation of the preferential trade agreement (PTA). Bohara et al. (2004) examine Argentina's experience during 1991–1996 under MERCOSUR and find that increased imports from Brazil led to the lowering of MFN tariffs in the same industries, which is consistent with the theoretical work of Richardson (1993). We note that neither of these empirical studies examines TTBs or market power motives that are the focus here.

important determinants of differences resulting from a cross-country analysis. Second, a focus on these two countries and the MERCOSUR agreement is not all that limiting; in section 2, we characterize a number of the sources of variation to the trade policy that Argentina and Brazil employed during the 1990s so as to illustrate why this is a sufficiently rich environment to begin an analysis of these questions in greater depth.

Argentina and Brazil underwent two distinct episodes during this decade – a 5-year period in which their relationship was characterized by a free trade area only, and a 5-year period characterized by adoption of a customs union and a common external tariff toward third countries. Furthermore, we also characterize the substantial variation in how each country independently applied its TTB policies. In particular, we find that Argentina and Brazil applied their TTBs independently of one another – i.e., on imports of separate products from different trading partners. In that respect, given the lack of harmonization of policies applied toward MERCOSUR non-partners during the customs union period, this raises the question of the extent to which the MERCOSUR institutional environment created the incentives that one might expect of a customs union during 1995–2001. Finally, given that Argentina also frequently imposed TTBs against imports from Brazil, this raises the even more primitive question of the extent to which the MERCOSUR institutional environment created the incentives that one might expect of even an internal free trade area.

After we introduce our estimation equation and the data utilized in the econometric analysis in section 3, we then turn in section 4 to our results. Instrumental variables (IV) estimates of an ordered probit model allow us to first show how we can replicate many of the essential features of the Estevadeordal et al. (2008) results for Argentina and Brazil, and in particular how during their FTA period (1990–1994), there is evidence of a building block effect of preferential tariff liberalization that then disappears in the second period (1995–2001) during the formation of their customs union. However, we also present evidence that a focus on applied tariffs alone for MERCOSUR may lead to a mischaracterization of the complexity of the relationship. In particular, we find that the results are affected considerably when we implement our more comprehensive measures of import protection that allow for consideration of Argentina's and Brazil's use of additional policy instruments through TTBs. When we include changes in import protection arising through TTBs, we no longer find evidence of a building block effect of preferential liberalization for the period in which MERCOSUR was only an FTA. Furthermore, we also find evidence of a stumbling block effect of preferential liberalization for the period in which MERCOSUR was becoming a customs union.

In section 5, we provide an initial exploration into whether measures of import market-power can help to explain this new pattern of results. This is motivated in part by the recent evidence, from a number of distinct trade policy settings, that market power motives can affect trade policy determination.[6] In particular, we utilize newly available data on inverse foreign export supply elasticities provided by Nicita et al. (2015) to

[6]Broda et al. (2008) provided the first direct evidence that countries exploit their market power in trade when setting tariffs outside of GATT/WTO constraints. Their results indicate that even countries thought to be small (in GDP terms) can have some market power for certain products. Bagwell and Staiger (2011) find that countries that joined the WTO in 1995–2005 set their pre-accession tariffs in a way consistent with manipulation of their terms of trade. Ludema and Mayda (2013) find that the MFN tariffs that WTO members set in the Uruguay Round are consistent with the terms-of-trade hypothesis. Bown and Crowley (2013a) also provide evidence of the role of the terms-of-trade motive in the determination of time-varying trade policy through a study of U.S. TTBs in use during 1997–2006. Bown (2015a) provides a survey of the empirical literature on this topic.

examine the theory that changes in Argentina's import market power in particular – such as those that might arise due to the customs union with a larger trading partner (Brazil) – may have acted as the stumbling block channel discouraging additional MFN liberalization. We are able to provide only very weak evidence of this potential effect arising from our data. Nevertheless, we conclude in section 6 with a potential institutional explanation behind this (non-) result by questioning the extent to which Argentina and Brazil really have formed a common external trade policy (that is jointly responsive to economic shocks), given that each country can (and does) implement its TTB policies toward third countries independently from the other, thus resulting in substantial deviations from a common MFN tariff.

This paper contributes to a number of other literatures in empirical trade policy. First, it is one of only a handful of papers that has attempted to consider the interplay between TTBs (in particular, antidumping) and preferential trade agreement implementation. Notable papers from this literature include Blonigen (2005), which studied the impact of NAFTA on U.S. antidumping use, and Prusa and Teh (2010) which provided a cross-country study of the effects of PTAs on the incidence of new antidumping import restrictions, finding they are increasing on PTA outsiders (relative to insiders) after implementation of the agreements.

This paper also contributes to a related literature on the intertemporal substitution of different trade policy instruments that may be arising due to a variety of different types of shocks. For example, Limão and Tovar (2011) study Turkey's trade policy substitution away from tariffs and toward a broad class of non-tariff barriers in response to its accession to the WTO in 1995 and its formation of a customs union with the European Union. Bown and Tovar (2011) use the "exogenous" shock of India's MFN tariff liberalization in the early 1990s to examine its policy substitution toward antidumping and safeguards (TTBs) using the Grossman and Helpman (1994) protection for sale framework. Finally, a number of studies examine how multilateral commitments in the GATT/WTO system – i.e., tariff bindings – act as constraint on applied tariffs and result in substitution toward policies such as TTBs in response to trade volume or macroeconomic shocks.[7]

Section 6 concludes with a more expansive discussion of the interpretation of the results in light of this literature, additional puzzles and questions that arise, and some directions for future research.

2. THE TRADE POLICY INSTITUTIONAL ENVIRONMENT FOR ARGENTINA AND BRAZIL, 1990–2001

2.1 MERCOSUR Free Trade Area (1990–1994) and Customs Union (1995–2001)

MERCOSUR originated as a free trade agreement among Argentina, Brazil, Paraguay and Uruguay under the Treaty of Asunción, which was signed on March 26, 1991.[8]

[7]Bown and Crowley (2013a) use the U.S. environment in which applied tariffs are constrained by WTO commitments to show how use of antidumping and safeguards can be interpreted as responding to terms-of-trade incentives and trade volume shocks consistent with the repeated game model of Bagwell and Staiger (1990). Using aggregate data in cross-country analyses covering high income and developing countries, respectively Bown and Crowley (2013b, 2014) also document how, as WTO commitments have constrained applied tariffs over time, countries substitute toward using TTBs in response to real exchange rate appreciations, increases in unemployment, and slowdowns in economic growth.

[8]It is built upon previous agreements that shaped the integration agenda between Argentina and Brazil since 1986; however, no major regional tariff liberalization took place until the end of 1990 (Bohara et al., 2004). Venezuela joined in 2006 and Bolivia is in the process of becoming a member.

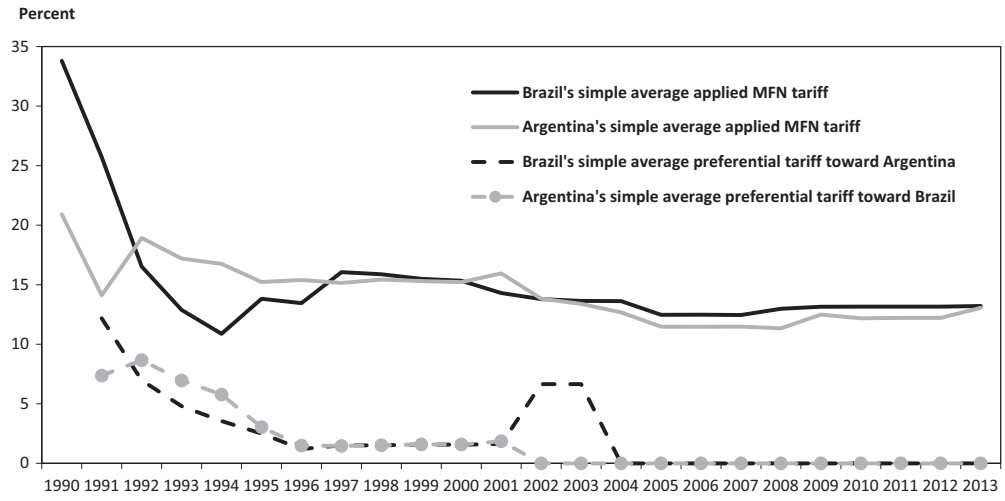

Figure 1. Argentina's and Brazil's Average applied MFN and preferential tariffs, 1990–2013. Source: Authors' calculations based on data from Estevadeordal et al. (2008), UNCTAD (TRAINS) and WTO.

After a substantial drop in internal tariffs in 1991 (see Figure 1), the agreement included successive tariff reductions in order to have a zero tariff on most goods by the end of 1994 (see Annex 1 of the Treaty of Asunción). The Treaty established the intention of forming a common market by December 31, 1994, which would include the establishment of a common external tariff (Article 1 of the Treaty of Asunción).

The second major step in the integration process took place with the Protocol of Ouro Preto, which was signed on December 16, 1994. The Protocol "amended the Treaty of Asunción with regard to the institutional structures of the economic block, transforming MERCOSUR from a Free Trade Area to a Customs Union" (MSU, 2016).[9] It also created the "Comisión de Comercio del MERCOSUR," which would be in charge of overseeing the application of the common trade policy instruments for the functioning of the customs union (Article 16 of the Protocol).

Figure 1 shows the average MFN tariffs that Argentina and Brazil applied, as well as the bilateral preferential tariff that each of those countries granted to the other as part of MERCOSUR. Applied MFN tariffs differ substantially before the customs union period until converging around 1995. Furthermore, and as we have already noted, there was only modest reductions in these countries' applied MFN tariffs after 1995. Indeed, in the period after the estimation sample that we introduce below, these tariffs are virtually unchanged: Argentina's average MFN tariff was 13.8% in 2002 and 13.1% in 2013, and Brazil's MFN tariff was 13.8% in 2002 and 13.2% in 2013. This suggests that it may be important to understand what took place in the 1990s, as that may have stalled the level of MFN liberalization afterward.[10]

[9]See also Bohara et al. (2004). Some products would enjoy temporary exemptions from the common external tariff.

[10]While not shown here, this experience is much different from that of a number of other Latin American countries in Estevadeordal et al. (2008). For example, countries like Chile, Colombia, Peru, and Mexico have much lower average MFN tariffs in 2013 than they did in 1995 or even 2002.

2.2 *Temporary Trade Barrier Policies of Antidumping and Safeguards*

Argentina's antidumping legislation dates back to 1972 (Moore, 2011), and it also has countervailing duties (CVDs) and safeguards (SGs) policies in place during some of our period of study, although these have been used much less frequently than antidumping. In 1994, the government modified its legislation on TTBs in order to begin bringing them in line with the newly arising WTO Agreements. That year, the government created the Comisión Nacional de Comercio Exterior (CNCE), which started operating in 1995 and was tasked with determining injury (for antidumping, SGs and CVDs) and recommending the imposition of measures to the Minister of Economy. The subsidy and dumping margins are determined by the Secretariat of Industry and Trade (Nogués and Baracat, 2006). After the introduction of new antidumping (AD) regulations and the creation of the CNCE, Argentina has subsequently become one of the major world users of AD in particular.

The Argentine government included a national interest clause that allows it to deny antidumping measures even if dumping and injury are found. Argentina's AD legislation also allows the freedom to apply a lesser duty. Initially, AD measures were usually applied for 2–3 years but, after 1998, the duration has increased and some measures are imposed for 5 years. The Treaty of Asunción among the MERCOSUR countries allows its members to use antidumping and CVDs against their partners. MERCOSUR did not include its own (internal) SG mechanism, and the use of SGs among members is banned (Nogués and Baracat, 2006).[11]

When the process of trade reform started in the late 1980s, Brazil also introduced its legislation for the use of TTBs, in order to manage potential changes in economic or political conditions that could arise as a result of the trade liberalization. The trade reform coincided with an increase in the use of TTBs (Olarreaga and Vaillant, 2011). In 1987, Brazil ratified the GATT Tokyo Round Codes on Antidumping and CVDs and the Customs Policy Commission (CPA) was charged with implementing the agreements and setting AD and CVDs. In 1995, the government created the Chamber of Foreign Trade (CAMEX), which is an overview agency governed by a Council of six ministers and presided over by the Ministry of Development, Industry and Commerce. TTB investigations are conducted by the Department of Commercial Defense in the Ministry of Development, Industry, and Foreign Trade. The decision of whether to impose a duty is made by CAMEX. The first decree concerning SG measures was introduced in 1995 and Brazil's first SG investigation took place in 1996. In 1995, Brazil also added a national interest provision that allows CAMEX not to impose an AD measure even if the investigation's determination is affirmative. It also added a lesser duty rule (Kume and Piani, 2006).

Overall, Argentina and Brazil both became major users of TTBs during the 1990s, joining the ranks of the EU and U.S., as well as other new emerging market economies such as China, India, Turkey and Mexico (Bown, 2011). Figure 2 shows the percentage of imports covered by all TTBs in effect (solid lines) and by AD only (dotted lines) in Argentina and Brazil over the period covering 1990–2013. Moreover, while Figure 1 shows a decrease in applied (MFN and preferential) tariffs taking place in the 1990s in Argentina and Brazil, Figure 2 shows that the stock of TTBs in place

[11]The use of SGs among members was only permitted until the end of 1994 and under exceptional circumstances (see Annex IV of the Treaty of Asunción).

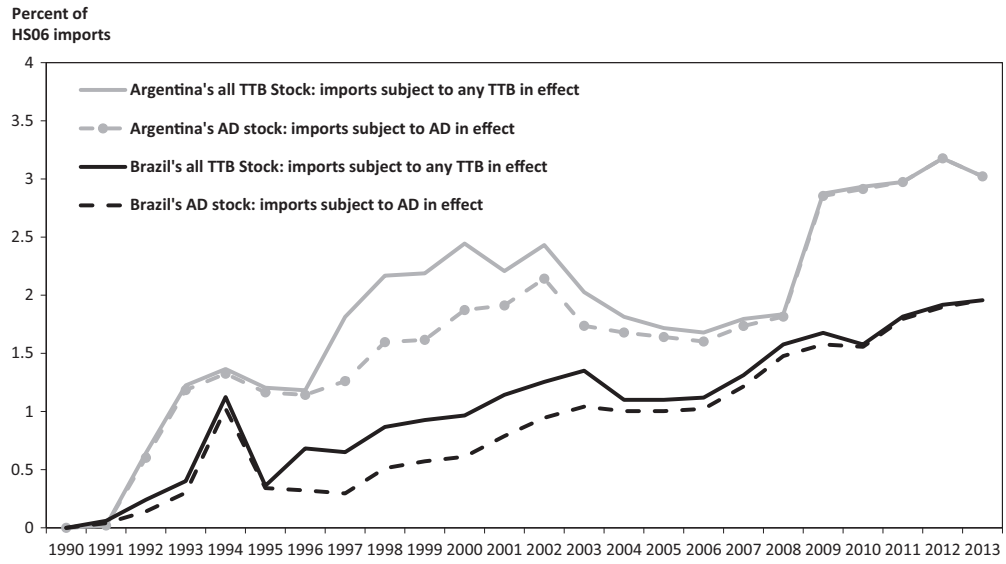

Figure 2. Argentina's and Brazil's import coverage by TTBs, 1990–2013
Source: Authors' calculations using data from Temporary Trade Barriers Database (Bown, 2015b).

increased during the same period in those countries. This also serves to motivate the importance of taking into account the use of these discretionary policy instruments in addition to applied import tariffs when examining the trade liberalization implemented by those countries. The figure shows that Argentina has been a more active user than Brazil of these TTB policies.

The TTB figures for Argentina and Brazil suggest that an empirical focus on applied tariff data alone during the 1990–2001 period may not capture the full picture of their import protection policies. Furthermore, beyond the level differences apparent in Figure 2, Argentina and Brazil differ in their use of these TTBs in additional ways that are economically important for our analysis.

As indicated in Table 1, there are sharp differences in some of the trading partners targeted by each country's antidumping cases over the period. Argentina initiated a total of 215 AD investigations in 1990–2001, of which 50 were against Brazil. In 1990–1994, it initiated 22 investigations against Brazil, and in 1995–2001 it initiated 28. In contrast, Brazil initiated 150 AD investigations in the period 1990–2001, but only three targeted Argentina. It initiated one investigation against Argentina in 1990–1994, and two in 1995–2001.[12] Thus, while both countries were frequent AD users during this period, the first major difference between them is that Argentina targeted Brazil frequently, while Brazil rarely used AD against Argentina. One important implication is that, even during the 1995–2001 period, MERCOSUR was not even a "pure" FTA between these two countries. A number of significant import barriers impeded bilateral trade between them, even for products in which the bilateral tariff may have been reduced to zero.

[12]There are similar patterns for AD import restrictions imposed. Argentina imposed 16 AD measures against Brazil during 1990–1994 and 26 in 1995–2001. Meanwhile, Brazil only imposed one AD measure (a price undertaking) against Argentina in each sub-period.

TABLE 1 ARGENTINA'S AND BRAZIL'S USE OF ANTIDUMPING BY TARGETED EXPORTING COUNTRY

1990–1994			1995–2001		
Exporting country target		AD investigations (share of total)	Exporting country target		AD investigations (share of total)
Rank			Rank		
A. Argentina					
1	Brazil	22 (0.33)	1	Brazil	28 (0.19)
2	European Union	10 (0.15)	2	China	28 (0.19)
3	China	6 (0.09)	3	European Union	27 (0.18)
4	South Korea	5 (0.07)	4	South Africa	9 (0.06)
5	Mexico	3 (0.04)	5	South Korea	8 (0.05)
6	United States	3 (0.04)	6	United States	8 (0.05)
7	Colombia	2 (0.03)	7	Chile	6 (0.04)
8	Japan	2 (0.03)	8	Taiwan	6 (0.04)
9	Taiwan	2 (0.03)	9	Czech Republic	2 (0.01)
10	Australia	1 (0.01)	10	Indonesia	2 (0.01)
	Other	11 (0.16)		Other	24 (0.16)
	Total	67 (1.00)		Total	148 (1.00)
B. Brazil					
1	United States	14 (0.23)	1	European Union	21 (0.23)
2	China	5 (0.08)	2	China	11 (0.12)
3	Indonesia	4 (0.07)	3	United States	11 (0.12)
4	Russia	4 (0.07)	4	Chile	3 (0.03)
5	European Union	4 (0.07)	5	Japan	3 (0.03)
6	Bangladesh	3 (0.05)	6	South Korea	3 (0.03)
7	Ukraine	3 (0.05)	7	Romania	3 (0.03)
8	Canada	2 (0.03)	8	Venezuela	3 (0.03)
9	Kazakhstan	2 (0.03)	9	South Africa	3 (0.03)
10	Mexico	2 (0.03)	10	Argentina	2 (0.02)
	Other	17 (0.28)		Other	27 (0.30)
	Total	60 (1.00)		Total	90 (1.00)

Source: Authors' calculations using data from Temporary Trade Barriers Database (Bown, 2015b).

Separating out their use of TTBs against each other, is there a common pattern to the TTBs that each country applied toward MERCOSUR non-partners? Importantly, is there any evidence of coordination in their use of TTBs during the customs union period in particular? There is little evidence from Table 1 to suggest this, as Argentina and Brazil used TTBs to target imports from different countries. The top export targets for each country were even quite different during the customs union period. Only China (a common target worldwide) and the EU are among the top five targets for both countries; and within the EU, Argentina and Brazil also tend to target different exporting countries.[13]

While not shown here, there are also considerable differences in the sectors that each country has subjected to TTBs. For example, over 1990–1994, Argentina tended to concentrate its antidumping activity in sectors such as metals (18 investigations), machinery/electrical (17), and textiles (6). Brazil, on the other hand, tended to use antidumping during this period in chemicals (18 investigations), metals (17), and vegetable products (6). Even during the customs union period of 1995–2001 important

[13]Argentina targeted Spain the most (with 6 initiations); while Brazil targeted mainly Germany and the UK (with 4 initiations against each).

sector-level differences remained: Argentina used AD primarily in metals (44 investigations) and machinery/electrical (31), while Brazil used antidumping to target chemicals (28 investigations) and plastics/rubbers (26).

Regarding safeguards, there were no initiations during the FTA period (1990–1994). In the customs union period, Argentina initiated five SG investigations, four of which led to the imposition of measures. Brazil initiated two SG investigations during the same period, both leading to the imposition of measures. In Argentina's case, measures were imposed on imports of footwear, motorcycles and peaches.[14] Brazil, on the other hand, imposed import restrictions on toys and coconuts.

The differences in the products and trade partners targeted by TTBs between Argentina and Brazil shows the lack of coordination in TTB use, even during the customs union period. We return to this important evidence below when we ask whether it is really feasible to expect that the two countries were exploiting (joint) market power given that they were not applying the same common external trade policy. Moreover, such variation differentially affects both the explanatory variable (that measures preferential liberalization) and the dependent variable (of changes in trade policy toward non-members of MERCOSUR) that we introduce next.

3. ECONOMETRIC METHODOLOGY AND DATA

3.1 *Econometric Model*

We are interested in the relationship between changes in the level of import protection that country j offers to country k under its preferential trade agreement in industry i, and how this affects changes in the level of import protection that country j offers to other trading partners $(-k)$ in the rest of the world that are not part of the agreement. We begin with the general estimation equation, a slight variant of the model in Estevadeordal et al. (2008), given by

$$\Delta\tau_i^{-k} = \alpha + \beta\left(L.\Delta Pref_i^k\right) + \mathbf{x}_i\theta + \varepsilon_i. \tag{1}$$

In equation (1), $\Delta\tau_i^{-k}$ represents the change in the level of import protection that country j offers to PTA outsiders (countries $-k$) in industry i and $L.\Delta Pref_i^k$ denotes the lagged change in applied bilateral import protection – i.e., typically capturing preferential *liberalization*, given the time period chosen for the study – that country j offers to PTA member country k in industry i. The vector $\mathbf{x}_i$ incorporates other variables that may influence changes in trade protection, and ε_i denotes the error term.

The main coefficient of interest in equation (1) is β. If $\hat{\beta} > 0$, then subsequent to country j liberalizing preferentially toward k, country j also reduced its levels of import protection toward countries $-k$ in industry i, and then preferential liberalization is interpreted as a *building block* for trade liberalization toward PTA outsiders. Conversely, $\hat{\beta} < 0$ would indicate that the country increased its levels of import protection toward

[14]The SG on footwear was imposed in 1997, after an almost 25% increase in the value of imports between 1993 and 1997. In the same period, and following the tariff cuts toward Brazil implemented under MERCOSUR, there was a substantial compositional change in the source of those imports. Imports from Brazil increased by about 500%, while imports from the rest of the world actually fell by 15% (and Argentina's MFN tariff had increased from 20% in 1993 to 33% in 1998). However, in the application of the SG, Argentina made the controversial decision to exempt the imports from MERCOSUR partners such as Brazil. Imports from Brazil then continued to increase in the following years, while imports from non-MERCOSUR partners continued to decline. For a greater discussion of this case, see Bown et al. (2015).

PTA outsiders following an episode of preferential liberalization, and would thus be evidence of a *stumbling block* effect of preferential liberalization.

The literature thus far, and in particular the Estevadeordal et al. (2008) approach from which we build, has defined $\Delta\tau_i^{-k}$ to be the change in the MFN tariff that country j applies toward imports from PTA non-partners, and it has defined $L.\Delta Pref_i^k$ to be the lagged change in the preferential tariff that country j applies toward imports from PTA partner k. The first contribution of our paper is to redefine each of these measures of import protection so that they include not only MFN and bilateral applied tariffs, but they also reflect country j's potential application of TTBs – i.e., antidumping and safeguards – on imports in industry i.

The decision to examine the impact of more expansive measures of import protection is again motivated by the data for Argentina and Brazil that we reported in section 2. At the same time that each was reducing its tariffs toward one another bilaterally and implementing applied MFN tariff changes toward MERCOSUR non-partner countries, each was also independently implementing its own new import protection through the application of TTBs.

Ideally, countries would apply their TTBs as ad valorem tariffs; if this were the case then we could simply redefine each of $\Delta\tau_i^{-k}$ and $L.\Delta Pref_i^k$ to reflect the sum of the applied ad valorem tariff plus the ad valorem TTB. Unfortunately, many (if not most) of the TTBs that Argentina and Brazil applied during this period were not in ad valorem form; they included the application of tariffs as specific duties, negotiated price undertakings with foreign exporters, and even quantitative restrictions (tariff rate quotas).[15] The implication is that, while the data that we have reveals the year, product, and trading partner affected by Argentina's and Brazil's applied TTBs, we do not know the exact (ad valorem equivalent) magnitude of these barriers so as to simply add them to applied tariff levels to construct more comprehensive measures of import protection. We thus propose two modifications that allow us to include the potentially valuable information on TTBs that we do have at our disposal, even though we do not know their exact ad valorem levels.

The first modification involves redefining the dependent variable of the change in the level of import protection facing imports of PTA non-partners. Our approach is to construct an ordered, categorical variable that combines information on the direction of the change in applied MFN tariff with information on the existence of any potential newly imposed TTBs against PTA non-partners. As shown in Table 2, we define this change in import protection variable as falling into one of three categories, where the highest value captures an increase in import protection toward outsiders, the lowest value captures a decline in import protection toward outsiders, and the middle value captures no change in the level of protection toward outsiders.

In terms of the econometric estimation, we therefore estimate the following equation for an ordered probit model:

$$y_i^* = \beta\left(L.\Delta Pref_i^k\right) + \mathbf{x}_i\theta + \mu_i, \tag{2}$$

[15]Price undertakings are an outcome in antidumping investigations that is similar to a voluntary export restraint. I.e., the exporter "voluntarily" agrees to raise its price above some threshold level that the policy-imposing government determines, and if the price falls below that level the government imposes a duty instead. Relative to the approach in Bown and Tovar (2011), which focused on how TTBs affected India's MFN liberalization, for example, during this period for Argentina and Brazil there were many more instances in which they implemented TTBs in a way through which direct ad valorem equivalent measures of the barrier are not available.

Table 2 Characterization of the Trade Policy Variables Used in the Estimation

Dependent variable: $\Delta\tau_i^{-k}$	Observed changes in MFN tariffs and TTBs
2: Increase in import protection on $-k$	• MFN tariff increases, TTB imposed on $-k$ • MFN tariff increases, TTB not imposed on $-k$ • MFN tariff unchanged, TTB imposed on $-k$
1: No change in import protection on $-k$	• MFN tariff unchanged, TTB not imposed on $-k$ • MFN tariff decrease, TTB imposed on $-k$
0: Decrease in import protection on $-k$	• MFN tariff decrease, TTB not imposed on $-k$

Explanatory variable: $L.\Delta Pref_i^k$	Observed changes in bilateral (PTA) tariffs and TTBs
Change in bilateral tariff on k	• Bilateral tariff decreases, TTB not imposed on k • Bilateral tariff unchanged, TTB not imposed on k
Zero	• Bilateral tariff decreases, TTB imposed on k • Bilateral tariff unchanged, TTB imposed on k

where y_i^* is a latent variable that represents $\Delta\tau_i^{-k}$ (which is unobserved), such that:

$$y_i = 0 \quad \text{if } y_i^* \leq \alpha_1$$
$$y_i = 1 \quad \text{if } \alpha_1 < y_i^* \leq \alpha_2$$
$$y_i = 2 \quad \text{if } y_i^* > \alpha_2.$$

Here α_1 and α_2 are unknown cutoff points, and the three possible outcomes are assigned as described in Table 2.[16]

The second modification involves redefining the key explanatory variable of interest in order to allow for the potential influence of country j implementing a TTB against PTA partner k. Again, while the data reveal the product and timing of all of country j's imposed TTBs on PTA partner k in sector i, we are not able to measure the (ad valorem equivalent) *size* of the TTB. First, we continue to define $L.\Delta Pref_i^k$ as the lagged change in the level of the bilateral import tariff if country j does not apply a TTB toward imports from partner k in sector i. However, if country j applies a TTB on imports from k in sector i, then we have $L.\Delta Pref_i^k \equiv 0$, i.e., we assume there is no change in the lagged bilateral level of import protection.[17] We also summarize the complete characterization of the key explanatory variable in Table 2.[18]

[16]For more details about the ordered probit model, see, for example, Wooldridge (2010).

[17]Implicitly this assumes that the size of the ad valorem equivalent to the AD/SG import restriction is equal to the size of the preferential tariff cut. In some instances, countries impose TTBs that are much larger than the size of preferential tariff cuts, which would indicate that this assumption is conservative. On the other hand, these TTBs are typically applied on only a subset of products within an ISIC 4-digit industry, for which case the assumption would be stringent.

[18]In theory, it is also be possible for a third category to exist, whereby a country increases its applied levels of bilateral tariff. However, there are no instances in our data for which the bilateral tariff (only) actually increases during the sample; it either decreases or remains unchanged.

3.2 *Econometric Methodology, IV Estimation, and Data*

The earlier literature has identified a number of econometric issues that arise when estimating models of the relationship between changes in levels of import protection that a country applies to PTA insiders and PTA outsiders. We briefly present them here; for a more in-depth discussion see Estevadeordal et al. (2008), as we essentially adopt their motivation and approach to dealing with these concerns. In particular, we focus on a subset of their 10 country sample and analyze the policies of Argentina and Brazil, the two largest MERCOSUR economies, over the period of 1990–2001.

First consider the measures of import protection. We lag $\Delta Pref_i^k$ 1 year since the bilateral tariff component is scheduled by the terms of the MERCOSUR agreement, and thus predetermined relative to MFN tariffs (or TTBs). In addition, adopting a lag helps lower simultaneity bias. Second, we define the preferential tariff in industry i in a given year as the minimum of the preferential tariff that the country applies on sector i in that year against any of its MERCOSUR partners. Finally, in the estimation, we drop the observations for which the MFN tariffs are set at zero. If the MFN tariff is zero, the preferential tariff would also have to be set at zero and that may bias the results.

The preferential tariff data component in $\Delta Pref_i^k$ come from the MERCOSUR tariff schedules, which establish how tariffs are to be reduced over time in each country and product. The tariffs are aggregated as simple averages into roughly one hundred four-digit ISIC industries.[19] In the period preceding the year in which a country grants the first preference in a given sector, the preferential tariff is set equal to the MFN tariff, and in that way the impact of the first reduction in a preferential tariff will be captured. Moreover, when a country does not offer any preference in a given sector in year t and $t-1$, we set the change in the preferential tariff to be zero, since a change in the MFN tariff in such case would *not* be related to preferential tariff changes.

The data required for the applied MFN tariff component of the dependent variable, $\Delta\tau_i^{-k}$, is taken from UNCTAD (TRAINS), the WTO, and is made available by the World Bank online via the World Integrated Trade Solution (WITS).

In our main specifications of interest, our measures of changes in levels of import protection, $\Delta\tau_i^{-k}$ and $\Delta Pref_i^k$, include not only the change in the MFN applied tariff and in the preferential tariff, respectively, but also the TTBs (AD and SG import restrictions) imposed against the rest of the world and the MERCOSUR partner. For example, if Argentina lowers its preferential tariff against Brazil under MERCOSUR but then it imposes AD or SG against Brazil on the same product, it is offsetting some of the tariff liberalization. Similarly, we assume that if Argentina (or Brazil) imposes an AD or SG duty against a non-MERCOSUR country, it reverses the MFN tariff cut that may have taken place subsequent to preferential liberalization. More precisely, if Argentina imposed any AD or SG import restrictions against Brazil during one of our sample periods, we consider it as a reversal of the preferential (tariff) liberalization implemented during that same period. The dependent variable is defined similarly. (See again Table 2.) The data on AD and SG import restrictions comes from

[19]We thank Estevadeordal, Freund, and Ornelas for sharing their data. As explained in Estevadeordal et al. (2008), the preferential tariff data had to be converted into a common nomenclature using the 4-digit ISIC classification, because the PTAs negotiated during the sample period used different tariff nomenclatures (e.g. NANDINA, NALADISA, HS) and tables for conversion were only available for ISIC codes.

government sources from those countries, as described in the *Temporary Trade Barriers Database* (Bown, 2015b).

Second, we adjust the baseline Estevadeordal et al. (2008) approach by examining changes in the variables defined as long differences. Long differences allow us to take into consideration the accumulation of a number of newly imposed TTBs that may have arisen over time, given that our main motivation is on the question of whether, at the ends of these periods, the accumulated effect was of a building block or stumbling block.[20] Specifically, the estimation sample uses the changes in bilateral import protection (potential preferential liberalization) taking place from 1990 to 2000, which we also split into two subperiods: 1990–1994 and 1994–2000. The 1990–1994 period captures MERCOSUR as an FTA, whereas 1994–2000 captures MERCOSUR as a customs union.[21] When Argentina imposes an antidumping or safeguard import restriction against Brazil in a given sector during the period under consideration (i.e., 1990–1994, 1994–2000, or 1990–2000), we treat that as an indicator that the preferential tariff cut during that same period was reversed.[22]

A third concern is the potential for the endogeneity of changes in preferential and external levels of import protection, especially if preferential liberalization is subject to reverse causation. Since the bilateral tariffs are negotiated in the agreement and their reductions take place over time under a specific schedule (also set during the negotiations), the changes in preferential tariffs are predetermined to changes in MFN tariffs and the imposition of AD or SG import restrictions. Nonetheless, if some MFN tariff changes were expected at the time the preferences were being negotiated, they could have affected the level of those preferences. To address this, we also follow Estevadeordal et al. (2008) by employing an IV approach whereby we instrument for a country's changes in levels of liberalization toward its PTA partner using the preferential tariff changes implemented by its PTA partners.[23] The correlations of the preferential tariffs in an agreement are generally high, and they are valid instruments as long as the preferential tariffs of a country's *partners* are not influenced by the same factors that determine that country's *own* MFN tariffs or TTBs.

In some of the specifications that define preferential liberalization over 1990–1994 or 1990–2000, the preferential tariff changes of the country's partners may not be highly correlated with the country's own preferential tariff changes, because in 1990 the preferential tariff was effectively the MFN tariff, which may vary more among MERCOSUR countries. In these cases we therefore resort to other instruments.[24] We

[20]The Estevadeordal et al. (2008) approach involves a panel structure at the annual frequency. Since they are interested in exploiting the cross-country aspects of their data in ways that are less relevant for the questions under investigation here (which are focused on Argentina and Brazil), the higher frequency data allows them to utilize industry fixed effects. By examining long differences, we do not need to control for other determinants (e.g., macroeconomic shocks, trade volume shocks, political-economic shocks) that the literature has shown affect intertemporal variation in TTB use at higher frequencies. See, for example, the discussion in Bown and Crowley (forthcoming).

[21]The changes in the dependent variable are defined 1-year forward relative to the preferential liberalization, that is, from 1991–1995, 1995–2001, or 1991–2001, respectively.

[22]When the estimation is being performed on the sample for Brazil and Brazil imposes an AD/SG against Argentina, the variable is defined analogously.

[23]We use the preferential tariff changes of the three main preferential partners of the country, as in Estevadeordal et al. (2008), which for Argentina and Brazil are the other MERCOSUR members.

[24]It is difficult to find instruments for preferential tariffs, as Estevadeordal et al. (2008) also discuss. Tariffs are usually instrumented using variables such as capital-labor ratios, or other industry characteristics of the importing country; these would be inappropriate as they relate to both preferential and MFN tariffs.

use the changes in the indexes of revealed comparative advantage (RCA) for the MERCOSUR *partners* from 1990 to 1994 to instrument for the preferential liberalization of Argentina (or Brazil) in each sample period.[25] If a partner has a larger comparative advantage in a certain good then that may affect the preferential tariff that Argentina gives to that partner, given that the partner stands to benefit more from a preference in that good. We thus calculate an index of RCA that is based on Balassa (1965) for each 4-digit ISIC sector and country. The index is given by $RCA = (X_{ij}/X_{tj})/(X_{iw}/X_{tw})$, where X_{ij} and X_{tj} denote exports of product i by country j and total exports by country j, respectively, and X_{iw} and X_{tw} are exports of product i and total exports by the world, respectively. A value greater than one indicates that the country has a RCA in that product relative to the world. We obtain the bilateral export data needed to construct the indexes of RCA from UN Comtrade.

The fourth issue involves the other potential contribution of our paper, which is to search for explanations of the potential causes of the variation in relative trade liberalization outcomes that we observe for Argentina and Brazil. In particular, since MERCOSUR eventually became a customs union during this period, we explore whether its members may be able to exploit their joint market power via the common external tariff. This is illustrated by a number of theoretical papers that have shown how customs unions may create new incentives for members to increase external levels of import protection, relative to when the agreement was "only" a free trade area.[26]

To capture this potential effect, we introduce measures of market power that rely on estimates of the inverse of the export supply elasticity that the policy-imposing country faces in an industry. For this we use the newly available foreign export supply elasticities provided by Nicita et al. (2015). Since there are no estimates of the export supply elasticities faced by MERCOSUR as a block, we proxy for the change in market power due to the customs union formation by first calculating the minimum of the export supply elasticities faced by the four MERCOSUR members, and then measuring the change in the inverse export supply elasticity, from that of the policy-imposing country to the inverse of the minimum export supply elasticity among the MERCOSUR members. We include this variable on the change in market power in $\mathbf{x}_i$ in estimates of equation (2) that we describe in section 5.

Panels A and B of Table 3 provide summary statistics for the data utilized in the estimation when measured over each of our estimation periods.

4. ESTIMATION RESULTS

This section presents estimates of the baseline model. First we estimate the model on data from changes in Argentina's trade policy before then reestimating the model on data from changes in Brazil's trade policy.

[25]Export data from WITS are available for most countries starting around 1990. We exclude Uruguay because its export data start only in 1994.

[26]For example, Kennan and Riezman (1990) show the existence of a tariff externality arising under a customs union. When a country imposes a tariff, the terms of trade of the other member improves when it is also an importer of that good, and this externality is internalized under a customs union because tariffs are set jointly. This tariff coordination effect means that, by coordinating their tariffs as one larger country, the members will want to raise their external tariffs to shift their terms of trade in their favor. Krugman (1991) shows that external tariffs will rise after the formation of a customs union because its members will want to take advantage of the increased size of the block to improve their terms of trade. See also Bond and Syropoulos (1996) and Syropoulos (1999).

TABLE 3 SUMMARY STATISTICS

Variable	Mean	SD	Minimum	Maximum	Observations
A. Argentina					
1991–1995					
ΔMFN	1.20	0.98	0.00	2.00	93
ΔMFN + AD	1.25	0.95	0.00	2.00	93
ΔMFN + AD + SG	1.25	0.95	0.00	2.00	93
*L.*ΔPref tariff	−15.11	4.30	−24.75	0.00	93
*L.*ΔPref tariff + AD	−12.82	6.60	−24.75	0.00	93
*L.*ΔPref tariff + AD + SG	−12.82	6.60	−24.75	0.00	93
Market power	0.67	0.47	0.00	1.00	91
1995–2001					
ΔMFN	1.16	0.95	0.00	2.00	91
ΔMFN + AD	1.33	0.82	0.00	2.00	91
ΔMFN + AD + SG	1.34	0.81	0.00	2.00	91
*L.*ΔPref tariff	−3.94	2.61	−13.65	1.37	91
*L.*ΔPref tariff + AD	−2.99	2.78	−13.65	0.30	91
*L.*ΔPref tariff + AD + SG	−2.87	2.65	−13.65	0.30	91
ΔMarket power	0.66	0.48	0.00	1.00	91
1991–2001					
ΔMFN	1.31	0.96	0.00	2.00	93
ΔMFN + AD	1.41	0.86	0.00	2.00	93
ΔMFN + AD + SG	1.41	0.86	0.00	2.00	93
*L.*ΔPref tariff	−19.42	4.18	−27.50	−7.39	93
*L.*ΔPref tariff + AD	−14.77	8.93	−27.50	0.00	93
*L.*ΔPref tariff + AD + SG	−14.47	8.95	−27.50	0.00	93
ΔMarket power	0.67	0.47	0.00	1.00	91
B. Brazil					
1991–1995					
ΔMFN	0.24	0.65	0.00	2.00	93
ΔMFN + AD	0.37	0.69	0.00	2.00	93
ΔMFN + AD + SG	0.37	0.69	0.00	2.00	93
*L.*ΔPref tariff	−31.04	18.87	−85.00	3.00	93
*L.*ΔPref tariff + AD	−31.04	18.87	−85.00	3.00	93
*L.*ΔPref tariff + AD + SG	−31.04	18.87	−85.00	3.00	93
Market power	0.67	0.47	0.00	1.00	91
1995–2001					
ΔMFN	1.54	0.85	0.00	2.00	88
ΔMFN + AD	1.57	0.80	0.00	2.00	88
ΔMFN + AD + SG	1.57	0.80	0.00	2.00	88
*L.*ΔPref tariff	−1.55	1.66	−9.10	1.16	88
*L.*ΔPref tariff + AD	−1.54	1.67	−9.10	1.16	88
*L.*ΔPref tariff + AD + SG	−1.42	1.63	−9.10	1.16	88
ΔMarket power	0.37	0.49	0.00	1.00	88
1991–2001					
ΔMFN	0.33	0.75	0.00	2.00	93
ΔMFN + AD	0.54	0.76	0.00	2.00	93
ΔMFN + AD + SG	0.54	0.76	0.00	2.00	93
*L.*ΔPref tariff	−33.00	18.85	−85.00	−0.06	93
*L.*ΔPref tariff + AD	−32.66	19.15	−85.00	0.00	93
*L.*ΔPref tariff + AD + SG	−30.76	19.26	−85.00	0.00	93
ΔMarket power	0.37	0.49	0.00	1.00	91

4.1 *Estimates for Argentina*

Table 4 reports results from estimating the basic ordered probit model for Argentina. To facilitate the interpretation, we present estimates of marginal effects of the highest categorical outcome of an increase in import protection on countries that are not MERCOSUR members ($-k$). The key explanatory variable in this basic regression is $L.\Delta Pref_i^k$, or the lagged change in Argentina's applied import protection toward its MERCOSUR partners. Columns (1)–(3) show the results for the long differences arising over the first subperiod, which is changes in Argentina's external import protection from 1991 to 1995 as a function of Argentina's preferential liberalization taking place during 1990–1994. Columns (4)–(6) examine the second period (1995–2001), and columns (7)–(9) investigate the full sample period (1991–2001).

Begin with column (1), in which case the dependent variable is the ordered variable corresponding only to the change in the MFN tariff, and the explanatory variable is only the change in the preferential tariff. Because this specification does not yet include information on TTBs, it is closest in spirit to Estevadeordal et al. (2008), albeit it is estimated in long differences (instead of annual changes) and not yet with IV. The estimates show what could be interpreted as the existence of a building block effect, since the marginal effect of the change in the preferential tariff is positive and significant at the 5% level. In column (1), a 1 percentage point reduction in Argentina's preferential tariff over 1990–1994 is associated with a subsequent 5.2 percentage point decrease in the probability that Argentina raised its MFN tariff for the same industry. More precisely, the predicted probability of an increase in the MFN tariff when evaluated at the means of the underlying data is 61.6%; the effect represents a decrease from 61.6% to 56.4%. Similarly, a decrease of 1 percentage point in the preferential tariff increases the probability of a decrease in the MFN tariff (lowest category) by 5.2 percentage points, from 38.4% to 43.6%, which represents a 14% increase in the probability.[27] The point estimate for the marginal effect is consistent with the evidence in Estevadeordal et al. (2008) that found building block effects of preferential *tariff* (only) liberalization for the case of free trade areas.[28]

The lower half of Table 4 also reports information on the frequency with which certain combinations of policy outcomes arise in the data used in the estimation. These statistics will turn out to be important in helping us to interpret some of the results that arise later; thus we defer their discussion until later in this section.

Beginning in column (2) and throughout the rest of the table, we instrument for Argentina's changes in applied import tariffs toward Brazil and thus utilize an IV-ordered probit model. In (4)–(6) we instrument using the bilateral tariff changes of Argentina's PTA partners, whereas in other specifications we sometimes use the changes in the indexes of RCA of the partners. More precisely, for period 1 and for the whole sample period for Argentina, the changes in the preferential tariffs of its MERCOSUR partners do not work well as instruments since the preferential tariff in 1990 was the MFN tariff. Given that this is less correlated among MERCOSUR

[27]This marginal effect is not shown but it is the negative of the one shown in the table, since for Argentina in period 1 when we are only using the change in the MFN tariff as the dependent variable (column 1), there are no cases in which the MFN tariff remained unchanged (no outcome 1 occurrences), and thus in those cases the results of the ordered probit are equivalent to those from a binary probit. When we add TTBs, as in column 3, all outcomes take place.

[28]Recall that in columns (1)–(3) we are focusing on changes in import protection taking place during MERCOSUR's pre-customs union (FTA) period.

Table 4 IV Estimates of Ordered Probit Model for Argentina

	Period of estimation and definition of dependent variable								
	1991–1995			1995–2001			1991–2001		
	ΔMFN (1)	ΔMFN (2)	ΔMFN + AD (3)	ΔMFN (4)	ΔMFN + AD (5)	ΔMFN + AD + SG (6)	ΔMFN (7)	ΔMFN + AD (8)	ΔMFN + AD + SG (9)
Marginal effects estimates of an increase in protection (Prob y = 2):									
*L.*ΔPref tariff	0.05**	0.07***		−0.10***			0.06***		
	(0.02)	(0.01)		(0.02)			(0.01)		
*L.*ΔPref tariff + AD			0.00		−0.10***			0.03***	
			(0.00)		(0.02)			(0.00)	
*L.*ΔPref tariff + AD + SG						−0.12***			0.03***
						(0.01)			(0.00)
Pref. liberalization reversed and protection ↑ on ROW			53–60%		39–89%	37–89%		62–86%	64–86%
Pref. liberalization maintained and protection ↑ on ROW	60%	60%	62–65%	56%	59–66%	60–67%	66%	67–72%	66–72%
Constant cut 1	−2.34**	−3.74***	−2.08***	0.88***	0.29	0.44	−4.05***	−1.81***	−1.80***
	(0.94)	(1.04)	(0.31)	(0.30)	(0.29)	(0.29)	(0.63)	(0.19)	(0.18)
Constant cut 2			−2.02***	1.08***	0.83***	1.00***		−1.66***	−1.66***
			(0.32)	(0.29)	(0.24)	(0.20)		(0.23)	(0.22)
Observations	93	93	93	91	91	91	93	93	93
Pseudo R^2	0.130								
Log pseudo-likelihood	−54.3	−317.8	−377.3	−271.2	−290.7	−284.8	−319.2	−410.2	−410.6

Notes: Robust standard errors in parentheses with *, **, and *** indicating statistically different from zero at the 10%, 5%, and 1% levels, respectively. Column 1 estimates of the marginal effects of the probit model do not use IV. Instruments in columns 2–3 and 7–9 are the lagged changes in the RCA indexes of the MERCOSUR partners. Instruments in columns 4–6 are the lagged changes in the preferential tariffs of the MERCOSUR partners.

members, Argentina's preferential tariff changes are not highly correlated with the preferential tariff changes of its partners for 1990–1994 or 1990–2000. For those periods we use the changes in the indexes of RCA of Argentina's partners as instruments. We report the first-stage estimates for the IV in the Appendix.[29]

The IV results from column (2) also suggest a building block effect of preferential tariff liberalization on MFN tariff liberalization, as obtained in the non-IV estimation. The marginal effect implies that a reduction of 1 percentage point in the preferential tariff lowers the likelihood of an increase in the MFN tariff of the good by 7 percentage points, more precisely from 60.2% to 53.4% (when the rest of the variables are at their mean values).[30] This effect is larger and more precisely estimated than that obtained in the regression without IV.

Next, we turn to column (3), which presents estimates revealing our first important result. So as to provide more comprehensive measures of import protection beyond tariffs, here we redefine the dependent and key explanatory variables so that they also include information on the antidumping import restrictions that Argentina imposed against non-MERCOSUR partners (thus affecting the definition of $\Delta\tau_i^{-k}$) and that Argentina imposed against Brazil (thus affecting the definition of $L.\Delta Pref_i^k$).[31] See again the definition of each in Table 2. While the estimate for the marginal effect of $L.\Delta Pref_i^k$ in column (3) is still positive, its size has been reduced substantially and it is no longer statistically different from zero. In this case, the insignificance of all marginal effects (including the ones not shown) indicates that a decrease in Argentina's bilateral import protection toward its MERCOSUR partners between 1990 and 1994 had *no effect* on the probability of an increase or decrease in the external level of protection (defined broadly so as to also include AD) that Argentina applied toward MERCOSUR outsiders between 1991 and 1995.

We interpret this as indicating that any building block effect of the preferential tariff liberalization that Argentina implemented during *even* its FTA period is eliminated once we take into account more comprehensive measures of import protection across PTA partners and non-partners.

One explanation for the column (3) result is given by the statistics reported in the middle rows of Table 4. Recall again from Table 2 how inclusion of TTBs into our consideration of the key explanatory variable (of the change in the level of bilateral import protection toward PTA partner k) can result in two outcomes: preferential liberalization was maintained or preferential liberalization was reversed. For each of these two possibilities, the table then reports the share of observations in which Argentina increased its overall level of protection vis-à-vis non-MERCOSUR countries (ROW). However, given that making an assessment on the change in the overall level of external import protection requires making an explicit comparison of the size of the change in the MFN tariff with the size of the change in the TTB, here we present the percentages as an interval of possible outcomes. In column (3), we find that for the observations in which Argentina's preferential tariff liberalization is reversed,

[29]The first-stage regressions from the IV-ordered probit estimations are shown in Appendix Table A1. Panel a shows the results for Argentina and panel b for Brazil. In columns (1)–(3), we report the results corresponding to each of the three sample periods that we work with in our basic model (associated with columns (2), (4) and (7) in Tables 3 and 4). The instruments are statistically significant in most cases.

[30]A decrease of 1 percentage point in the preferential tariff increases the likelihood of a decrease in the MFN tariff from 39.8% to 46.6%.

[31]Again, Argentina did not utilize any safeguard import restrictions during this period.

between 53% and 60% also resulted in Argentina increasing overall levels of import protection toward ROW.[32] Furthermore, even in the observations in which Argentina's preferential *tariff* liberalization was maintained, 62–65% resulted in Argentina *increasing* overall levels of import protection toward ROW.[33] Thus, there are more cases in which protection against the ROW increases and fewer cases in which it falls relative to columns (1) and (2).

Next consider the period for which MERCOSUR became a customs union, and thus the estimates for Argentina in columns (4)–(6).[34] Column (4) replicates the IV specification from column (2) on data from the second period and now indicates evidence of the existence of a statistically significant *stumbling block* relationship. The marginal effect from the table means that a reduction of 1 percentage point in the preferential tariff *increases* the probability of an increase in the MFN tariff of the good by 9.8 percentage points. Therefore, for the customs union period of 1995–2001, the predicted probability of an increase in the MFN tariff increases from 54.1% to 63.9%. The marginal effects from that regression also indicate that a reduction of 1 percentage point in the preferential tariff reduces the probability of a decrease in the product's MFN tariff by 9.7 percentage points (not shown), from 40.0% to 30.3%. This is also broadly consistent with Estevadeordal et al.'s (2008) results for Latin America. They also do not find a building block effect in the case of customs unions, and in some of their specifications they find evidence of a stumbling block effect for customs unions.

What is the impact of including TTBs in the measures of import protection during the customs union period? Column (5) introduces the data on Argentina's antidumping use for the customs union period, and thereby reproduces the specification from column (3) on the second period's data. In comparison to the column (4) estimates, the size and statistical significance of the results are virtually unchanged. However, the marginal effect increases in size in column (6) of Table 4, which includes Argentina's application of both antidumping and safeguard import restrictions during the customs union period. A 1 percentage point decrease in $L.\Delta Pref_i^k$(i.e., more preferential liberalization) increases the probability of an increase in protection against non-member countries by 11.6 percentage points (from 55.8% to 67.4%). Although not reported in the table, the probability of a decrease in protection against non-members falls by 11.0 percentage points due to a 1 percentage point decrease in the explanatory variable, from 23.9% to 12.9% (and it is significant at the 1% level).

Our second major result for Argentina is therefore that the stumbling block effect of preferential liberalization arising under a customs union becomes slightly larger (and more precisely estimated) once TTBs and, in particular, safeguards, are also

[32]In general it is possible that levels of import protection toward ROW were unchanged. However, in most instances this is a rare outcome. Here, for example, it turns out that in 40–47% of such observations, Argentina decreased overall levels of protection toward ROW.

[33]In the first case, if we assume none of Argentina's TTBs were sufficiently large to over-ride the change in the MFN tariff, then in 53% of the observations in which Argentina's preferential tariff liberalization is reversed, Argentina increased its overall level of import protection toward ROW. If we assume that all of Argentina's TTBs were large enough to over-ride the change in the MFN tariff, then in 60% of the observations in which Argentina's preferential tariff liberalization is reversed, Argentina also increased its overall level of import protection toward ROW. Note that columns (1) and (2) in Table 3 do not have statistics for this because the data do not include consideration of imposed TTBs by construction.

[34]The second subperiod involves Argentina's changes in protection toward non-member countries from 1995 to 2001 as a function of changes in preferential import protection taking place between 1994 and 2000.

included in the measure of import protection.[35] Consistent with that result, the statistics shown in the middle rows indicate that the percentage of cases in which preferential liberalization is accompanied by an increase in protection against the ROW increases from 56% in column (4) to 60–70% in column (6).

The last three columns from Table 4 show the results from the long-difference estimation over the entire sample. In particular, they examine Argentina's changes in protection toward non-members taking place between 1991 and 2001 as a function of changes in Argentina's levels of its preferential import protection taking place between 1990 and 2000. The estimates for β are positive and statistically different from zero, though they are only half as large in columns (8) and (9) when the constructed variables include measures of Argentina's TTBs in addition to tariffs, again showing the impact of these more expansive measures of import protection that include additional policy instruments.[36]

However, before concluding that these positive estimates for β over the longer period are evidence of an overall *building block* effect of Argentina's preferential "liberalization," consider the patterns of variation in the data now underlying the key explanatory variable. First, the estimation is clearly picking up a positive relationship between changes in Argentina's levels of preferential protection and changes in levels of its protection toward MERCOSUR outsiders. To what extent are these results driven by variation across the cases in which Argentina's actually lowers – as opposed to increases – the levels of preferential import protection applied toward its MERCOSUR partners?

First, once we take into consideration TTBs in addition to tariffs, Argentina actually *increased* its level of preferential import protection vis-à-vis its MERCOSUR partners in 24% of the observations over this period. Across those observations, Argentina then increased its overall level of import protection against ROW between 62% and 86% of the time. Second, across the 76% of observations in which Argentina actually lowered its tariff preferentially (and did not reverse it through a TTB) toward MERCOSUR, in only 28% to 33% of the instances did Argentina reduce overall levels of import protection vis-à-vis ROW.

Overall, we conclude from these patterns that the positive estimate for β is not really a "building block" effect, as the positive relationship is mostly driven by instances in which Argentina's preferential import protection *increase* was followed by a multilateral import protection *increase*, and not preferential liberalization leading to multilateral liberalization (i.e. both sets of trade policy are moving in the *other* direction).

To summarize the results for Argentina, we find that any evidence of a building block effect in the FTA period is eliminated once we introduce TTBs and thus utilize more comprehensive measures of both changes in the levels import protection toward MERCOSUR partners and outsiders. Second, including Argentina's application of TTBs (particularly SGs) also magnified the size and significance of the stumbling

[35]The non-IV regressions give a similar result, and the magnitude of the increase in the stumbling block effect is even larger and its statistical significance increases, from a marginal effect significant at the 10% level that indicates that a reduction of 1 percentage point in the preferential tariff increases the probability of an increase in the MFN tariff of the good by 4.4 percentage points, to one significant at the 1% level that leads to an increase in the product's MFN tariff by 6.6 percentage points, once AD and SGs are included.

[36]The marginal effect from column 7 implies that a 1 percentage point fall in the preferential tariff lowers the likelihood of an increase in the MFN tariff of the good by 6.0 percentage points, from 60.1% to 54.1%, while the one from column 8 implies a decrease in the same probability by 2.9%, from 58.3% to 55.4%.

block effect arising during the MERCOSUR customs union period. Over the entire sample period, once we include TTBs we find highly correlated acts of Argentina engaging in market closing toward both MERCOSUR partners and toward external partners.

4.2 Estimates for Brazil

Table 5 provides the results from the basic ordered probit model for Brazil's change in its external level of import protection (vis-à-vis MERCOSUR outsiders) as a function of the lagged change in the level of Brazil's import protection applied toward PTA partners. Each column in Table 5 corresponds to the same specification and time period as the respective column from Table 4. The qualitative pattern to the results for Brazil is surprisingly consistent with what we observed for Argentina. While this consistency of estimates is somewhat reassuring, it was not obvious that this would turn out to be the case given the anecdotal evidence presented in section 2 on the TTBs in use during the period. Argentina and Brazil are permitted to independently implement their own TTB policies (both toward third countries and toward each other), and the evidence is that each country actually utilized that independence to pursue quite different patterns of TTB use during the period.

Columns (1)–(3) of Table 5 correspond to Brazil's FTA period. The non-IV results from column (1) indicate the existence of a building block effect of preferential liberalization on MFN tariffs. The magnitude is that a reduction of 1 percentage point in the preferential tariff reduces the probability of an increase in the MFN tariff of the good by 0.5 percentage points, and thus smaller than we estimated for Argentina.[37] Furthermore, when we use IV (column 2), we find that there is no effect of preferential liberalization on MFN tariffs. This continues to hold even when we redefine the explanatory and key dependent variables to include Brazil's application of TTBs in column (3).[38]

During the customs union period of 1995–2001, we find evidence of a stumbling block effect of Brazil's preferential liberalization, which increases in size once we take into account the use of both AD and SG (columns 4–6).[39] However, this effect is only significant at the 10% level, in contrast to the one we found for Argentina (in Table 4), which was significant at the 1% level.

The primary qualitative difference for Brazil relative to Argentina involve the estimates for the long differences that compare the changes in the level of external import protection taking place between 1991 and 2001 as a function of the changes in the level import protection offered to MERCOSUR partners taking place between 1990 and 2000. None of the estimates in columns (7)–(9) are statistically different from zero. The wider range in the statistic provided in the first of the middle rows of the table is also consistent with finding no effect.[40]

[37]The predicted probability of an increase in the MFN tariff when evaluated at the means of the underlying data is 9.0%; therefore, the effect represents a decrease from 9.0% to 8.5%. Similarly, a 1 percentage point reduction in the preferential tariff increases the probability of a decrease in the MFN tariff by 0.5 percentage points, from 91.0% to 91.5%.

[38]As was also the case for Argentina during the FTA period, Brazil only utilized antidumping and did not apply any safeguard import restrictions until the customs union period.

[39]Notice the large percentage of cases in which preferential import protection reduction was maintained and protection against the ROW increases in columns 4–6, consistent with the stumbling block finding.

[40]I.e., there is a potentially large percentage of cases in which preferential liberalization was *reversed* and protection against the ROW falls, and also a large percentage of cases, 62–82% (not shown), in which preferential liberalization was *maintained* and protection against the ROW falls.

Table 5 IV Estimates of Ordered Probit Model for Brazil

	Period of estimation and definition of dependent variable								
	1991–1995			1995–2001			1991–2001		
	ΔMFN (1)	ΔMFN (2)	ΔMFN + AD (3)	ΔMFN (4)	ΔMFN + AD (5)	ΔMFN + AD + SG (6)	ΔMFN (7)	ΔMFN + AD (8)	ΔMFN + AD + SG (9)
Marginal effects estimates of an increase in protection (*Prob y = 2*):									
*L.*ΔPref tariff	0.01***	0.01		−0.08*			0.01		
	(0.00)	(0.01)		(0.05)			(0.00)		
*L.*ΔPref tariff + AD			0.01		−0.09*			0.00	
			(0.00)		(0.05)			(0.00)	
*L.*ΔPref tariff + AD + SG						−0.10*			0.01
						(0.05)			(0.01)
Pref. liberalization reversed and protection ↑ on ROW			–		100%	75–100%		0–100%	0–100%
Pref. liberalization maintained and protection ↑ on ROW	9%	9%	9–24%	74%	74–78%	74–77%	16%	16–36%	17–34%
Constant cut 1	0.37	0.09	−0.07	−0.24	−0.32	−0.30	0.21	−0.25	−0.45
	(0.36)	(0.76)	(0.56)	(0.35)	(0.37)	(0.38)	(0.66)	(0.63)	(0.68)
Constant cut 2			0.46		−0.21	−0.19		0.51	0.36
			(0.59)		(0.35)	(0.36)		(0.58)	(0.61)
Observations	92	93	93	88	88	88	93	93	93
Pseudo R^2	0.12								
Log pseudo-likelihood	−29.5	−419.0	−454.4	−198.9	−207.5	−208.9	−408.5	−468.1	−466.1

Notes: Robust standard errors in parentheses with *, **, and *** indicating statistically different from zero at the 10%, 5%, and 1% levels, respectively. Column 1 estimates of the marginal effects of the probit model do not use IV. Instruments in columns 2–9 are the lagged changes in the preferential tariffs of the MERCOSUR partners.

There are two points worth reiterating, given the strong similarity in the results for Argentina and Brazil. Again, the similarity is that more comprehensive measures of import protection beyond MFN and bilateral applied tariffs tend to *reverse* any potential building block evidence from the MERCOSUR FTA period (1990–1994) and tend to *strengthen* the stumbling block evidence arising during the MERCOSUR customs union period (1995–2001).

First, we recall from section 2 that Brazil has been much less active in using TTBs than Argentina overall and thus, against external, non-MERCOSUR partners. In 1991–1995, there are 13 industries (out of the 93 that we have in table 4) in which Argentina imposed an AD measure against the ROW. In 1995–2001, there are 30 industries (out of 91) in which Argentina imposed a TTB (AD or SG) against the ROW. Brazil also imposed an AD measure against non-MERCOSUR partners in 13 industries in 1991–1995, but it imposed a TTB in only 17 industries in 1995–2001, about half as many as Argentina.

Second, Brazil utilized TTBs against Argentina with much less frequency, whereas Brazil has been a frequent target of Argentina's TTB use. For example, in column 3 of Table 5, there were no cases in which preferential liberalization was reversed by Brazil imposing AD against Argentina during 1991–1995. During 1995–2001, there are only four instances in which preferential liberalization was reversed by Brazil imposing a TTB (AD or SG) against Argentina (column 6). Meanwhile, during 1991–1995, there are 15 cases in which Argentina reversed its preferential liberalization by imposing an AD measure against Brazil; and during 1995–2001, there are 19 instances of such reversal by imposing a TTB.

To conclude this section, while the overall pattern of our results for Argentina and Brazil is similar, especially once we define the changes in import protection more broadly (to include additional policy instruments beyond tariffs), there are two subtle differences worth highlighting. The first difference is in how Argentina and Brazil arrived at this similarity – i.e., a comparison of columns (1), (2) and (3) in each table suggests that Argentina had potentially "more" of a building block effect (apparent in the tariff only data) for its TTBs to overcome than did Brazil. Second, in the raw data on TTB use, we have also observed a substantial difference in how each country utilized TTBs during this period (both overall and toward each other). We use the next section to explore the role of market power in potentially shaping these results. Before turning to the next section, a final point worth mentioning is that our results are robust to redefining the measuring of TTBs in the dependent variable in the following way. We re-estimated all the specifications from Tables 4 and 5 but redefining the dependent variable such that whenever there is a TTB imposed, it is considered as an increase in protection (i.e., in Table 2, the case in which there is an MFN tariff decrease and a TTB is imposed is now reclassified as an increase in protection (that is, as outcome 2)). The results (available on request) are also robust to this.

5. DOES MARKET POWER MATTER?

In this section we explore the role of import market power in potentially explaining the results that we have identified thus far. We first use the terms-of-trade theory to motivate the two different channels through which we propose market power might affect the results before then turning to the estimates. Our approach here is a first step; to our knowledge, the literature has not yet formally investigated these particular questions empirically.

5.1 *Theory and implementation*

Here we rely on the terms-of-trade theory to articulate two main channels through which measures of import market power could affect our estimated results on determinants of the changes in external levels of import protection against PTA outsiders.

First, the basic terms-of-trade theory suggests that countries may be more hesitant to cut any import tariffs in products and sectors in which they have market power. On its face, this would suggest that industries in which country j has import market power may be less likely to cut external and preferential tariffs. However, when a country adopts an FTA, there is a basic *institutional* expectation under the GATT that country j will nevertheless liberalize tariffs internally (toward PTA partner k) on substantially all trade; i.e., even where country j may have bilateral import market power relative to k.[41] If this is the case empirically, then we may observe preferential tariff liberalization but not external liberalization in sectors in which country j has import market power. As such, we will examine whether country j's level of import market power is positively related to $\Delta\tau_i^{-k}$; i.e., we may observe less external liberalization in industries in which the country has an incentive to use its trade policy to shift the terms of trade in its favor.

Second, consider a comparison of the adoption of two different types of trade agreements – free trade areas vs. customs unions – and the potential impact of the *change* in the level of import market power that country k experiences under each type of agreement. First, to clarify, there should be no change in the level of import market power arising under an FTA. There will, however, be an increase in the level of market power that country k experiences arising under a customs union due to the adoption of the common external MFN tariff toward non-partners $-k$. Thus, if we are measuring the change in the level of import market power correctly, we would expect that larger increases (changes) in market power when country k adopts the customs union be positively related to $\Delta\tau_i^{-k}$.

However, suppose we introduce a naïve (and imperfect) measure of the change in country j's import market power defined as the difference between its individual level of market power, and the highest level of market power of any of the other PTA partners $-k$. As we have indicated, during the period that MERCOSUR is a customs union, the theory predicts that an increase in market power will generate terms-of-trade incentives to increase external barriers against PTA outsiders, $\Delta\tau_i^{-k}$. Note, however, that we also anticipate this effect to be more likely to arise for Argentina relative to Brazil based on the way in which we have been forced to construct this variable. In most instances, the MERCOSUR partner with the most individual market power is Brazil, given that it is so much larger (in population) than the other members.[42] Thus,

[41]This is the basic requirement of the GATT's Article XXIV, which is the general exception permitting FTAs and customs unions. However, developing countries can also implement FTAs and customs unions under the GATT's Enabling Clause, which does not have such a stringent requirement that internal tariffs must be liberalized on substantially all trade, and MERCOSUR was notified to the GATT under the Enabling Clause. Given that the exact meaning of substantially all trade under GATT Article XXIV, or that any limits to the additional exception granted by the Enabling Clause, has never been clearly defined, the ultimate impact of this potential institutional constraint is an empirical question.

[42]The 1994 populations for the MERCOSUR countries were Argentina (34.4 million), Brazil (159.4 million), Paraguay (4.7 million) and Uruguay (3.2 million). Thus the adoption of the common external tariff in 1994 increases the size of Argentina's market by nearly 500% (in population terms) compared to only 27% for Brazil.

a limitation of our measure is that the change in import market power variable for Brazil is likely to exhibit less variation around zero, which may make it difficult to identify any effect.

Finally, in addition to investigating whether the level or change in import market power affects $\Delta\tau_i^{-k}$ directly, our approach also allows us to examine whether the failure to include the influence of market power in our regressions in Tables 3 and 4 resulted in omitted variables bias for our estimates of $\hat{\beta}$, i.e., we will also take care to examine whether our estimates of the impact of changes in levels of import protection offered to PTA insiders are affected by inclusion of these market power concerns.

In terms of implementation, we consider and ultimately introduce a number of measures of import market power as a new explanatory variable into $\mathbf{x}_i$ in our estimation equation (2). Again, we are interested in capturing the potential effect that market power may have on changes in external tariffs ($\Delta\tau_i^{-k}$), as well as how its inclusion may affect the estimates of our main explanatory variable of interest, $L.\Delta Pref_i^k$. We use the export supply elasticities estimated by Nicita et al. (2015) that are provided for each country at the 6-digit Harmonized System level. Because the elasticity estimates are at more disaggregated level than our data, we concord them to the 4-digit ISIC level using the median of the 6-digit HS level elasticities within each 4-digit ISIC industry.[43]

Since some of the theoretical predictions that we have described relate to the level of an importing country's market power, we sometimes utilize measures of the level of the inverse foreign export supply elasticity. However, the elasticity estimates are known to be imprecise; thus we construct a medium-high inverse export supply elasticity indicator, which equals one for the two-thirds of products with the highest inverse elasticity values in the given country.

In some specifications we consider measures of the *change* in the importing country's import market share resulting from the formation of the customs union. We proxy for the change in market power resulting from the customs union formation by first computing the minimum of the export supply elasticities faced by the four MERCOSUR members, and then measuring the change in the inverse export supply elasticity, from the importing country (either Brazil or Argentina, depending on the specification) to the inverse of the minimum export supply elasticity of the MERCOSUR members. And we again use a medium-high increase in market power indicator.

5.2 *Estimation Results*

Table 6 provides the IV-ordered probit estimates for Argentina and Brazil that explore the inclusion of different measures of import market power for during the three different MERCOSUR periods of the FTA only (1990–1994), the customs union only (1995–2001), and the entire sample (1990–2001). With the exception of the newly added measures of market power that we describe in more detail below, otherwise the IV-ordered probit model is estimated just as presented in Tables 3 and 4.

The results obtained for Argentina when adding the inverse elasticity indicator in period 1 are shown in columns 1–3 in panel A of Table 6. Column 1 corresponds to the non-IV specification from column 1 of Table 4 but also includes this additional variable to capture the effect of the level of market power during the FTA period. The results for

[43]The results using the mean instead of the median for the concordance are qualitatively similar.

Table 6 IV Estimates of Ordered Probit Model: TTBs and Market Power

	1991–1995			1995–2001			1991–2001		
	ΔMFN (1)	ΔMFN (2)	ΔMFN + AD (3)	ΔMFN (4)	ΔMFN + AD (5)	ΔMFN + AD + SG (6)	ΔMFN (7)	ΔMFN + AD (8)	ΔMFN + AD + SG (9)
A. Argentina									
Marginal effects estimates of an increase in protection (*Prob y = 2*):									
*L.*ΔPref tariff	0.06***	0.06***		−0.10***			0.06***		
	(0.02)	(0.01)		(0.02)			(0.01)		
*L.*ΔPref tariff + AD			0.0003		−0.10***			0.03***	
			(0.0003)		(0.02)			(0.00)	
*L.*ΔPref tariff + AD + SG						−0.12***			0.03***
						(0.01)			(0.00)
Market power	0.25**	0.22***	0.0001						
	(0.11)	(0.08)	(0.0004)						
ΔMarket power				−0.01	−0.01	0.02	−0.0001	0.19	−0.08
				(0.09)	(0.08)	(0.08)	(0.08)	(0.17)	(0.07)
Observations	91	91	91	91	91	91	91	91	91

	1991–1995			1995–2001			1991–2001		
	ΔMFN (1b)	ΔMFN (2b)	ΔMFN + AD (3b)	ΔMFN (4b)	ΔMFN + AD (5b)	ΔMFN + AD + SG (6b)	ΔMFN (7b)	ΔMFN + AD (8b)	ΔMFN + AD + SG (9b)
B. Brazil									
Marginal effects estimates of an increase in protection (*Prob y = 2*):									
*L.*ΔPref tariff	0.01***	0.01		−0.08*			0.001		
	(0.00)	(0.01)		(0.04)			(0.004)		
*L.*ΔPref tariff + AD			0.01		−0.08**			0.001	
			(0.00)		(0.04)			(0.004)	

(continued)

TABLE 6 *(continued)*

	1991–1995			1995–2001			1991–2001		
	ΔMFN (1b)	ΔMFN (2b)	ΔMFN + AD (3b)	ΔMFN (4b)	ΔMFN + AD (5b)	ΔMFN + AD + SG (6b)	ΔMFN (7b)	ΔMFN + AD (8b)	ΔMFN + AD + SG (9b)
*L.*ΔPref tariff + AD + SG						−0.09**			0.002
						(0.04)			(0.005)
Market power	0.04	0.04	0.03						
	(0.05)	(0.07)	(0.06)						
ΔMarket power				0.13	0.15	0.15*	−0.08	−0.06	−0.08
				(0.09)	(0.09)	(0.09)	(0.07)	(0.07)	(0.06)
Observations	91	91	91	91	91	91	91	91	91

Notes: Robust standard errors in parentheses with *, **, and *** indicating statistically different from zero at the 10%, 5%, and 1% levels, respectively. Column 1 estimates of the marginal effects of the probit model do not use IV. Instruments in columns 2–3 and 7–9 are the lagged changes in the RCA indexes of the MERCOSUR partners. Instruments in columns 4–6 and 1b–9b are the lagged changes in the preferential tariffs of the MERCOSUR partners.

the preferential tariff change variable are qualitatively and quantitatively similar to those from column 1 of Table 4. Moreover, the inverse export supply elasticity indicator has a positive and statistically significant effect on the change in MFN tariffs, as expected, since an increase in market power in a product provides an incentive to increase the MFN tariff of that product to benefit from the terms-of-trade improvement. In columns 2–9, we instrument for $L.\Delta Pref_i^k$. The results in column 2 are similar to those of column 1. As before, when we redefine our dependent and main explanatory variables to include AD, in column 3, we find no effect of preferential liberalization on protection against the ROW. The market power variable is now not significant.

For the customs union period (columns 4–6) and the whole period (columns 7–9), we use an indicator for the change in market power, as defined above, rather than its level. We do not find evidence that our measure for the change in market power arising from the formation of the customs union has affected import protection against non-MERCOSUR countries. Equally important, our previous results regarding our main explanatory variable, $L.\Delta Pref_i^k$, already discussed in section 4, remain qualitatively and quantitatively similar.

Panel B shows the results from analogous specifications for the case of Brazil. Again, we do not find any systematic evidence of an effect of our market power measures, and the results regarding the effect of preferential liberalization on external protection from Table 5 remain unaltered.[44]

The elasticity of export supply in an industry can also be endogenous to the level of import protection that exists in that industry, and there is measurement error in the estimated elasticities; therefore, we also tried instrumenting for the market power variable. We used the average market power in the other MERCOSUR countries in the same good as instrument.[45] Again, we did not find any systematic evidence of an effect of market power on the dependent variable, and our previous results regarding the effect of preferential liberalization and TTBs still hold.[46]

One potential and likely contributing explanation behind the weakness of our results linking any influence of import market power to changes in external tariffs is due to our poor measures of import market power, which may simply be ill-suited to this particular application. Given the necessity for our exercise to utilize the tariff data from the early 1990s, in order to match the Estevadeordal et al. (2008) approach, the analysis had to be conducted at the relatively aggregated ISIC 4-digit level. As we have noted, measurement error for the elasticities is a generally recognized problem,

[44]As robustness, we also tried using the level of the market power variable instead of the indicator. We tried both the level and the log of the inverse export supply elasticity (and their changes due to the customs union), but overall the variable was less significant or had the wrong sign in some cases (and we also tried winsorizing the elasticities by setting the extreme values at the values at the 5th and 95th percentiles of the distribution). However, our results regarding the effect of preferential liberalization and the effects of including TTBs in the estimations remain robust. The results are also robust to working with the elasticities at the 4-digit HS level from the estimates from Nicita et al. (2015), concorded similarly, but overall the market power variable was less significant in some cases. Furthermore, we also tried adding the interaction of the market power variable (in levels, logs or the indicator) with the preferential liberalization variable, but the interaction was not significant.

[45]Since we cannot use an IV-ordered probit when the endogenous regressor is not continuous, we do not employ the medium-high inverse export supply elasticity indicator. Instead, we use the level of the inverse export supply elasticity, and we set the top 5% of the elasticity data to the value at the 95th percentile of the distribution, and the bottom 5% to the value at the 5th percentile of the distribution, to deal with extreme values of the estimated elasticities.

[46]Those results are not shown but are available on request.

and we have attempted to address it through a variety of standard techniques. Nevertheless, in this particular setting, it may simply be that the measurement error may have been compounded given that the elasticity estimates were constructed from a slightly later time period and given the need to concord elasticity estimates from the 6-digit HS to 4-digit ISIC level. Future work utilizing different, and perhaps more disaggregated data and potentially improved measures of elasticities may be a promising avenue to pursue, given the richness of the policy variation in the underlying setting.[47]

Nevertheless, a separate and important potential explanation that we also cannot rule out, and which is supported by the broader patterns in the underlying data, is that Argentina and Brazil did not exploit their market power after formation of the customs union because, institutionally, de facto there was no customs union. Given that each country pursued its TTB policies independently, easy access to this "escape clause" may have resulted in both Argentina and Brazil being unable to exploit any of their joint market power by raising their (joint) levels of import protection toward PTA outsiders in concert. Put differently, market power may be more likely to matter if Argentina and Brazil had been committed to actually changing the common external MFN tariff jointly or by coordinating their antidumping and safeguards policies jointly against non-members. The MERCOSUR institutional framework certainly did not require TTB coordination to occur, and the result is that these countries' TTB policy applications were clearly not coordinated in practice (see again section 2).

6. CONCLUSION

This paper has examined the relationship between changes in a country's external trade policy offered toward non-PTA partners as a function of changes in the country's trade policy offered toward PTA partners. Our empirical setting has focused on the two major economies of MERCOSUR – Argentina and Brazil – and we estimate different effects for the period in which MERCSOSUR was an FTA (1990–1994) from when it was a customs union (1995–2001). Our primary innovation is to consider measures of trade policy that are more expansive than tariffs and that also include the TTBs of antidumping and safeguards. When considering all available policy instruments, we present evidence of an economically significant stumbling block effect arising during the customs union period, and our results also tend to reverse any potential evidence of a building block effect that may have been thought to arise (based on tariffs alone) during its FTA period.

These results are novel; however, they do not completely resolve the puzzles identified by the existing literature. Furthermore, our analysis of the highly detailed policy data raises a number of other interesting and yet unaddressed questions worthy of additional empirical research.

First, our results call into relief the need for additional work to construct more "complete" product-level measures of import protection that take into consideration all available trade policy instruments. This is something that we have also noted in other settings (Bown and Tovar, 2011) and for which some efforts have been made, albeit only in the cross-section (e.g., Kee et al., 2008, 2009). One potential explanation behind why our estimates are not stronger is our reliance on categorical variables for

[47]See, in particular, the methodological advancements for estimating elasticities proposed by Soderberry (2015) and his application for estimates for the United States.

some of the policy outcomes; construction of measures of the ad valorem equivalents for the imposed TTBs may improve upon the estimation considerably.

Second, we also take a first step toward examining the role of import market power on the interplay between the relative changes in trade policy affecting PTA partners and PTA non-partners. Given our desire in this paper to hew relatively closely to the Estevadeordal et al. (2008) approach so as to make our first set of results as comparable as possible, our market power variables may contain too much measurement error to have proven useful for this particular environment. The basic approach, however, could surely be improved upon in other empirical settings that are able to rely on more disaggregated trade policy data (typically made available after 1995) and further refinements to the elasticity estimates that seem to be improving over time.

Third, and more generally, examination of the patterns of the raw trade policy data and our results call into question whether it is accurate to *characterize* that Argentina and Brazil have either a customs union during the second period (1995–2001) or even a free trade area during the first period (1990–1994); at least in the sense in which economic models define such terms. Specifically, Argentina implemented a significant number of antidumping import restrictions against Brazil during 1990–1994, many of which reversed the effect of the preferential tariff cuts that Argentina had been simultaneously offering. Thus, even the FTA component of the MERCOSUR agreement from Argentina's perspective is arguably not entirely free. Furthermore, both Argentina and Brazil implemented their own TTB policies independently toward third countries (MERCOSUR non-members) during 1995–2001 (and 1990–1994); but the effect of this was to eliminate much of the harmonization toward a common external MFN tariff that the two countries may have otherwise been adopting.

Our analysis of the details of the trade policies put to use by Argentina and Brazil reveals substantial variation that suggests not only additional puzzles, but also potentially exciting avenues for future research on the interplay of each of these policies within MERCOSUR. For example, to what extent do relationships between bilateral tariffs, MFN tariffs, and market power motives affect the wide variety of types of trade restrictions – price undertakings, tariff rate quotas, and specific duties, in addition to ad valorem duties – that these countries actually implement under their TTB policies?

Understanding the evolution of trade policy for Argentina and Brazil during this period is arguably extremely important. The process of trade liberalization that these countries began in 1990, while sizeable, has stalled out well short of free trade – in 2014, Argentina's simple average applied tariff was 13.6% and Brazil's simple average applied tariff was 13.5%, both mostly unchanged from their levels in the latter half of the 1990s. A better understanding of the trade policy interplay happening in these countries in the 1990s may be a key ingredient to any explanation behind the determinants of their trade policies in place even today.

A final important point that we highlight is that, to the extent that utilizing a more complete set of policy instruments – e.g., changes to tariffs and non-tariff barriers, such as TTBs – shows additional margins of trade policy discrimination between PTA members and non-members, this may also contribute to explaining what Limão (forthcoming) refers to as the "PTA trade elasticity puzzle." The puzzle is that the tariff liberalization associated with PTAs is extremely large relative to that expected by the impact of the PTA tariff cuts alone; possible explanations include that either PTAs increase the trade elasticity with respect to tariffs and/or they reduce relative trade costs through channels well beyond tariffs. To the extent that PTAs may also be

associated with increased TTBs on non-members, this decreases the relative trade costs for PTA members relative to non-members.

APPENDIX

Table A1 First Stage Regressions

Dependent variable	1991–1995 *L.*ΔPref tariff (1)	1995–2001 *L.*ΔPref tariff (2)	1991–2001 *L.*ΔPref tariff (3)
A. Argentina			
*L.*ΔRCA_BRA	0.45**		0.48
	(0.22)		(0.33)
*L.*ΔRCA_PRY	0.49***		0.42**
	(0.09)		(0.19)
*L.*ΔPref tariff_BRA		0.70***	
		(0.14)	
*L.*ΔPref tariff_PRY		0.03	
		(0.04)	
*L.*ΔPref tariff_URY		0.25*	
		(0.13)	
Constant	−14.95***	−0.99	−19.27***
	(0.43)	(0.79)	(0.42)
Observations	93	91	93
B. Brazil			
*L.*ΔPref tariff_ARG	−0.86	0.26***	0.31
	(0.61)	(0.08)	(0.52)
*L.*ΔPref tariff_PRY	0.11	−0.03	0.22*
	(0.28)	(0.04)	(0.11)
*L.*ΔPref tariff _URY	2.03***	0.16**	1.16**
	(0.43)	(0.07)	(0.46)
Constant	−1.59	0.42	8.91
	(13.47)	(0.58)	(8.43)
Observations	93	88	93

Note: Robust standard errors in parentheses with *, **, and *** indicating statistically different from zero at the 10%, 5%, and 1% levels, respectively.

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REFERENCES

Bagwell, K. and R. W. Staiger, 1990, A theory of managed trade. *American Economic Review* 80, 779–795.

——— and ———, 2011, What do trade negotiators negotiate about? Empirical evidence from the World Trade Organization. *American Economic Review* 101, 1238–1273.

Balassa, B., 1965, Trade liberalization and "revealed" comparative advantage. *Manchester School* 33, 99–123.

Baldwin, R. and A. Venables, 1995, Regional economic integration. *Handbook of International Economics* 3, 1597–1644.

Blonigen, B. A., 2005, The effects of NAFTA on antidumping and countervailing duty activity. *World Bank Economic Review* 19, 407–424.

Bohara, A., K. Gawande and P. Sanguinetti, 2004, Trade diversion and declining tariffs: evidence from MERCOSUR. *Journal of International Economics* 64, 65–88.

Bond, E. and C. Syropoulos, 1996, The size of trading blocks: market power and world welfare effects. *Journal of International Economics* 40, 412–437.

Bown, C. P., 2011, Taking stock of antidumping, safeguards and countervailing duties, 1990–2009. *World Economy* 34, 1955–1998.

———, 2015a, What's left for the WTO? World Bank Policy Research Working Paper No. 7502, December.

———, 2015b, Temporary trade barriers database. The World Bank. Available at http://econ.worldbank.org/ttbd/, last accessed April 2016.

——— and M. A. Crowley, 2013a, Self-enforcing trade agreements: evidence from time-varying trade policy. *American Economic Review* 103, 1071–1090.

——— and ———, 2013b, Import protection, business cycles, and exchange rates: evidence from the great recession. *Journal of International Economics* 90, 50–64.

——— and ———, 2014, Emerging economies, trade policy, and macroeconomic shocks. *Journal of Development Economies* 111, 261–273.

——— and ———, forthcoming, The empirical landscape of trade policy, in: K. Bagwell and R. W. Staiger, eds., *The Handbook of Commercial Policy* (Elsevier, North Holland, the Netherlands).

——— and P. Tovar, 2011, Trade liberalization, antidumping, and safeguards: evidence from India's tariff reform. *Journal of Development Economics* 96, 115–125.

———, B. Karacaovali and P. Tovar, 2015, What do we know about preferential trade agreements and temporary trade barriers? in: A. Dür and M. Elsig, eds., *Trade Cooperation: The Purpose, Design and Effects of Preferential Trade Agreements* (Cambridge University Press, Cambridge, UK) pp. 433–462.

Broda, C., N. Limão and D. Weinstein, 2008, Optimal tariffs and market power: the evidence. *American Economic Review* 98, 2032–2065.

Calvo-Pardo, H., C. Freund and E. Ornelas, 2011, The ASEAN free trade agreement: impact on trade flows and external trade barriers, in: R. J. Barro and J.-W. Lee, eds., *Costs and Benefits of Economic Integration in Asia* (Oxford University Press, Oxford, UK) pp. 157–186.

Crivelli, P., 2014, Regionalism and falling external protection in high and low tariff members. Geneva School of Economics and Management Working Paper No. 14-08-2.

Estevadeordal, A., C. Freund and E. Ornelas, 2008, Does regionalism affect trade liberalization toward nonmembers? *Quarterly Journal of Economics* 123, 1532–1575.

Freund, C. and E. Ornelas, 2010, Regional trade agreements. *Annual Review of Economics* 2, 139–166.

Grossman, G. M. and E. Helpman, 1994, Protection for sale. *American Economic Review* 84, 833–850.

Karacaovali, B. and N. Limão, 2008, The clash of liberalizations: preferential vs. multilateral trade liberalization in the European Union. *Journal of International Economics* 74, 299–327.

Kee, H. L., A. Nicita and M. Olarreaga, 2008, Import demand elasticities and trade distortions. *Review of Economics and Statistics* 90, 666–682.

———, ——— and ———, 2009, Estimating trade restrictiveness indices. *Economic Journal* 119, 172–199.

Kennan, J. and R. Riezman, 1990, Optimal tariff equilibria with customs unions. *Canadian Journal of Economics* 23, 70–83.

Ketterer, T., D. Bernhofen and C. Milner, 2014, Preferences, rent destruction and multilateral liberalization: the building block effect of CUSFTA. *Journal of International Economics* 92, 63–77.

———, ——— and ———, 2015, The impact of trade preferences on multilateral tariff cuts: evidence for Japan. *Journal of the Japanese and International Economies* 38, 31–51.

Krugman, P. R., 1991, Is bilateralism bad? in: E. Helpman and A. Razin, eds., *International Trade and Trade Policy* (MIT Press, Cambridge) pp. 9–23.

Kume, H. and G. Piani, 2006, Antidumping and safeguard mechanisms: the Brazilian experience, 1988–2003, in J. Michael Finger and J. J. Nogués (eds.), *Safeguards and Antidumping in Latin America's Trade Liberalization: Fighting Fire with Fire* (Palgrave Macmillan, New York) pp. 79–107.

Limão, N., 2006, Preferential trade agreements as stumbling blocks for multilateral trade liberalization: evidence for the U.S. *American Economic Review* 96, 896–914.

———, forthcoming, Preferential trade agreements, in: K. Bagwell and R. W. Staiger, eds., *The Handbook of Commercial Policy* (Elsevier, North Holland, the Netherlands).

——— and P. Tovar, 2011, Policy choice: theory and evidence from commitment via international trade agreements. *Journal of International Economics* 85, 186–205.

Ludema, R. D. and A. M. Mayda, 2013, Do terms-of-trade effects matter for trade agreements: theory and evidence from WTO countries. *Quarterly Journal of Economics* 128, 1837–1893.

Mai, J. and A. Stoyanov, 2015, The effect of the Canada-US free trade agreement on Canadian multilateral trade liberalization. *Canadian Journal of Economics* 48, 1067–1098.

Moore, M. O., 2011, Argentina: there and back again? in: C. P. Bown, ed., *The Great Recession and Import Protection: The Role of Temporary Trade Barriers* (CEPR and World Bank, London, UK) pp. 317–350.

MSU, 2016, MERCOSUR: History. Michigan State University, Broad College of Business. Available at http://globaledge.msu.edu/trade-blocs/MERCOSUR/history, last accessed April 12, 2016.

Nicita, A., M. Olarreaga and P. Silva, 2015, Cooperation in WTO's tariff waters. University of Geneva mimeo, revised.

Nogués, J. J. and E. Baracat, 2006, Political economy of antidumping and safeguards in Argentina, in: J. Michael Finger and J. J. Nogués, eds., *Safeguards and Antidumping in Latin America's Trade Liberalization: Fighting Fire with Fire* (Palgrave Macmillan, New York) pp. 45–78.

Olarreaga, M. and M. Vaillant, 2011, Brazil: micro- and macro-determinants of temporary trade barriers, in: C. P. Bown, ed., *The Great Recession and Import Protection: The Role of Temporary Trade Barriers* (CEPR and World Bank, London, UK) pp. 287–316.

Panagariya, A., 2000, Preferential trade liberalization: the traditional theory and new developments. *Journal of Economic Literature* 38, 287–331.

Prusa, T. J. and Teh, R., 2010, Protection reduction and diversion: PTAs and the incidence of antidumping disputes. NBER Working Paper No. 16276.

Richardson, M., 1993, Endogenous protection and trade diversion. *Journal of International Economics* 34, 309–324.

Soderberry, A., 2015, Estimating import supply and demand elasticities: analysis and implications. *Journal of International Economics* 96, 1–17.

Syropoulos, C., 1999, Customs unions and comparative advantage. *Oxford Economic Papers* 51, 239–266.

Tovar, P., 2012, Preferential trade agreements and unilateral liberalization: evidence from CAFTA. *World Trade Review* 11, 591–619.

Wooldridge, J., 2010, *Econometric Analysis of Cross Section and Panel Data*, 2nd edn. (MIT Press, Cambridge).