UNIVERSITÉ
DE GENÈVE
GENEVA SCHOOL OF ECONOMICS
AND MANAGEMENT

WPS 14-08-2 Working Paper Series

Regionalism and Falling External Protection in High and Low Tariff Members

Pramila Crivelli

August 2014

Regionalism and Falling External Protection in High and Low Tariff Members*

Pramila Crivelli†

August 2014

Abstract

This paper provides evidence that the reduction in applied most-favored nation (MFN) tariffs resulting from a decrease in preferential tariffs is restricted to (or significantly larger in) high-tariff members of preferential trade agreements (PTAs). This heterogeneous impact is observed only when the share of preferential imports increases, leading to a decline in tariff revenue. This makes countries which tend to heavily depend on tariff revenue as a source of government funding more likely to reduce their MFN tariffs, which is also observed in the data. These results lend support to the "building bloc" view of regionalism, in particular for countries applying high external tariffs before the agreement. They are also consistent with a mechanism operating through trade deflection and the associated loss of tariff revenue.

Keywords: Regionalism, Preferential Trade Agreements, Trade Diversion, External Tariff, Trade Liberalization, Tariff Revenue
JEL-Classification: F13, F15

*I gratefully acknowledge Marcelo Olarreaga, Jaime de Melo, Emanuel Ornelas, Caroline Freund, three anonymous referees and all the participants of the Trade Workshops at the University of Geneva, in particular Céline Carrère, Frederic Robert-Nicoud, and Cristian Ugarte.

†Institute of Economics and Econometrics, Geneva School of Economics and Management, University of Geneva, 40 Bvd du Pont d'Arve, CH-1211 Geneva 4, Switzerland, e-mail: pramila.crivelli@unige.ch

I. Introduction

Whether preferential trade liberalization leads to an increase or decrease in external protection on imports from nonmembers is crucial to determine welfare effects for both members and nonmembers. Theoretically, the impact is ambiguous.[1] Empirically, Estevadeordal, Freund and Ornelas (2008) as well as other studies based on developing countries (see for example Calvo-Pardo, Freund and Ornelas (2009)) provide evidence that preferential and applied external tariffs move together, ie. preferential and MFN tariffs are complements.[2] However, other studies based on developed countries (Limão (2006), Karacaovali and Limão (2008)) show that multilateral tariffs (ie. bound MFN tariffs) increases as preferences are granted.

I will not try to reconcile the previous results from the empirical literature. My objective is, rather, to try to identify one of the potential channels through which external protection falls in developing countries where tariffs are still significant using the extensive sample of ten Latin American countries of Estevadeordal, Freund and Ornelas (2008), with tariff data at the four-digit level (ie. 100 industries). More precisely, I examine how differences in initial external protection (ie. MFN nondiscriminatory applied tariffs) can explain the degree of post-PTA external liberalization. When a PTA is created between high- and low- external tariff partners, provided that origin requirements are met, exports from the low-tariff country to the high-tariff country increase since producers within the PTA arbitrage between the prices received in the two markets. This rise in exports from the low-tariff country to the high-tariff PTA member implies that less tariff revenue is collected in the high-tariff importing partner (as imports from the partner benefit from preferential access). Under *enhanced protection*, this creates incentives to offset this loss by reducing external protection if governments care about tariff revenue when setting trade policies.[3]

Identifying the channels through which protection declined in some of these PTAs is important as it helps in understanding the different results obtained in the empirical litera-

[1] The decrease in external tariff within free trade areas (FTAs), named *tariff complementarity effect* by Bagwell and Staiger (1999) was first raised in Richardson (1993) and thereafter found in several other theoretical papers, in particular Freund (2000) and Ornelas (2005*a*,*b*). Those predictions contrast sharply with those of Levy (1997), Krishna (1998), Limão (2007) and Karacaovali and Limão (2008) showing that PTAs are likely to hinder multilateral trade liberalization. For an overview of the theoretical literature on regionalism, see Baldwin (2009).

[2] For recent reviews of the theoretical and empirical literature on regionalism, see Freund and Ornelas (2010), (Ornelas, 2012, III.) and World Trade Organization (2011).

[3] An FTA provides *enhanced protection* (Grossman and Helpman (1995)) if the export supply of the low-tariff country is not sufficient to satisfy the whole import demand of the FTA trading partner at the initial price level. This case, which corresponds to welfare-reducing trade deflection, is studied by Richardson (1995) in a dynamic Nash game where strategic interaction between high- and low-tariff countries lead to a new equilibrium with lower external protection.

ture. Indeed, if trade deflection occurs, the observed reduction in tariffs imposed on imports from nonmembers should be restricted to, or at least be significantly larger in, high-tariff PTA members. As the United States and the European Union already exhibit relatively low multilateral tariffs and government revenue from tariffs is negligible, the model does not apply and the fall in external protection will not be observed. Further, when the domestic sales of the low-tariff country are shifted to the high-tariff PTA partner in an enhanced protection case, which is a valid assumption in my sample where imports from the preferential partner entirely replace imports from the world for only two observations, the subsequent reduction in external protection is mainly driven by tariff revenue considerations. As supported in Gawande, Krishna and Olarreaga (2007), tariff revenues play a much smaller role as determinant of external protection in more developed countries. This is likely to be why we observe different patterns in the United States and the European Union compared to Latin America's PTAs.

To identify whether differences in initial tariffs play a role in explaining the decline in external protection, I estimate the same model as Estevadeordal, Freund and Ornelas (2008) but extend it to capture differences in initial tariffs in PTA partners. Results suggest that the main finding in Estevadeordal, Freund and Ornelas (2008), namely a “complementarity effect" between regional and multilateral trade liberalization[4], is significantly larger when the external tariff applied by the preference-granting country is initially larger than in the partner country. Indeed, the impact in low-tariff countries turns out to be insignificant once controlling for the industry-year fixed effect.

Further, I provide additional evidence supporting the idea whereby trade deflection and the associated loss of tariff revenue is the channel though which external protection decreases within PTAs. First, I show that the sharper fall in MFN tariffs observed within high-tariff countries is significantly stronger when the reduction in the preferential tariff leads to a subsequent rise in the share of imports from the regional partner (preferential imports) out of total imports. Second, I provide evidence that the impact of preferential tariff reduction on the subsequent fall in MFN tariffs is heterogeneous across high- and low-tariff members of the PTA only when the share of tariff revenue out of total tax revenue is relatively high. All results are consistent with the suggested mechanism , which is supported by the fact that no impact is observed within customs unions (CUs), where this increase in trade from the

[4]The term *multilateral trade liberalization* hereafter refers to the reduction in nondiscriminatory tariffs, ie. tariffs applied on an MFN basis to imports from any nonmember of the PTA as opposed to preferential tariffs that are exclusively granted to PTA partners.

low- to the high-tariff member is not possible as external tariffs are equal. This absence of impact within CUs is a common finding in the literature that can stem from various models (Estevadeordal, Freund and Ornelas (2008), Karacaovali and Limão (2008)).

The paper is organized as follows. Section 2 presents the empirical model used to capture the initial difference in external protection. Section 3 reports the benchmark results, robustness checks and extensions. In section 4, I discuss and provide further evidence on the underlying mechanism that lead to the benchmark findings. Section 5 concludes.

II. Data and Empirical model

I use the panel data set provided by Estevadeordal, Freund and Ornelas (2008), which includes disaggregated tariff data at the ISIC four-digit level for 100 industries in ten Latin American countries from 1990 to 2001. The included countries are: Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Paraguay, Uruguay and Venezuela. Table A.1, at the end of the paper, describes the sample as well as the agreements and the years in which they came into effect. The empirical model follows Estevadeordal, Freund and Ornelas (2008), who regressed variations in applied MFN tariffs on lagged variations of preferential tariffs interacted or not with a customs union dummy variable (CU). To capture any heterogeneity between countries, I include an additional binary variable (D^{MFN}) indicating whether or not the country is the high-tariff member of the PTA.[5] The final specification is the following:

$$\begin{aligned} \Delta MFN_{ijt} = \gamma_{jt} + \gamma_{ij} + \gamma_{it} + \beta_1 \cdot \Delta PREF_{ijt-1} + \beta_2(\Delta PREF_{ijt-1} \cdot CU_{jt-1}) \\ + \beta_3(\Delta PREF_{ijt-1} \cdot D^{MFN}_{ijt-1}) + \beta_4 \cdot D^{MFN}_{ijt-1} + u_{ijt} \end{aligned} \tag{1}$$

where MFN_{ijt} is the applied MFN tariff set by country j in industry i at time t, γ_{jt}, γ_{ij} and γ_{it} are respectively country-year, country-industry and industry-year fixed effects, and u_{ijt} stands for the error term. Unlike MFN tariffs, preferential tariffs vary by trading partner, requiring a country-specific measure of preferential liberalization ($PREF_{ijt}$). Following Estevadeordal, Freund and Ornelas (2008), the latter is defined as the minimum preferential tariff

[5] In testing Richardson's (1993) hypothesis, Bohara, Gawande and Sanguinetti (2004) used a trade diversion dummy equal to one if internal imports from the PTA partner in a given sector increased more or decreased less than did imports from the rest of the world during the period. While they focus on the quantity effect of trade diversion, which is present in customs unions, I concentrate on the condition under which the deflection of domestic sales occurs, ie. external tariff differences, which only applies to FTAs.

rate that a country grants to its partners, for a given sector and year:

$$PREF_{ijt} \equiv \min_{k}\{\tau^{k}_{ijt}\} \qquad \text{with} \qquad \tau^{k}_{ijt} < MFN_{ijt} \tag{2}$$

with τ^{k}_{ijt} being the preferential tariff set by country j on imports from partner k in sector i at time t. Accordingly, the additional dummy variable D^{MFN} is defined as follows:

$$D^{MFN}_{ijt} = \begin{cases} 1 & \text{if} \quad MFN_{ijt} > MFN_{ik_0t} \\ 0 & \text{otherwise} \end{cases} \tag{3}$$

where MFN_{ik_0t} denotes the (average) MFN rate in sector i at time t of the partner country (countries) k_0 to which country j grants the lowest preferential tariff rate.

To control for factors other than the declining preferential tariffs that could impact the multilateral liberalization, a broad set of fixed effects is included. First, some macroeconomic shocks may affect external tariffs over all industries, for example a national economic crisis or a broad trade liberalization programme. Second, for economic, political or historical reasons, within countries, some industries tend to be more protected than others. These macroeconomic shocks as well as the different levels of trade openness across sectors are assumed to be other major causes of external tariff variations. As in Estevadeordal, Freund and Ornelas (2008), they are captured respectively by the country-year and country-industry fixed effects. Moreover, in an attempt to identify a causal relationship, I carry out estimations including industry-year fixed effects to control for all potential macroeconomic factors varying at the industry-year level that could drive the results, such as international sectoral agreements or sectoral liberalization programmes, harmonization of standards, sectoral recession or changes in world prices. This considerably strengthens the identification strategy and constitutes an important contribution to the literature.

The customs union dummy variable (CU_{jt}) is equal to one for Mercosur and Andean Community (CAN) members from 1995 onward and zero otherwise. Because of perfect multicollinearity with the country-year fixed effect, the variable CU alone has been dropped. Its interaction with $PREF$ is used as an additional control variable. While members of Free Trade Areas (FTAs)[6] can set external tariffs independently, CU members set their trade policy jointly and MFN tariffs are supposed to be harmonized. Hence, an interaction term between

[6]In this paper, FTA is used as opposed to CU even though applied preferential tariffs may not be zero.

CU and the MFN dummy is not required. As the mechanism put forward in this paper is only present within FTAs, a statistically significant β_2 entailing a systematic difference observed between the two types of PTAs is consistent with a causal relationship from preferential to multilateral trade liberalization.[7]

In equation (1), β_3 represents the impact of a change in the preferential tariff on the subsequent MFN variation for a country which is not part of a CU and whose external tariff is higher than that of its trading partner to which the preference is granted. In line with Grossman and Helpman (1995) and Richardson (1995), β_3 is expected to be significant and positive. As trade deflection should essentially occur towards high-tariff members, β_1 is expected to be lower than β_3 or even insignificant. In addition, β_1 is expected to be lower in the full model than in the version estimated by Estevadeordal, Freund and Ornelas (2008) where β_3 and β_4 are constrained to zero and γ_{it} is not included. Combined with a positive and significant β_3, this would suggest that part of the effect has been captured by the coefficient on the interaction term $\Delta PREF \cdot D^{MFN}$, which is consistent with the idea whereby trade liberalization towards nonmembers of the PTA is sharper when the level of external protection (reflecting prices) is initially higher, that is, when the incentives for the producers in the low-tariff country to increase exports to the PTA partner are stronger.

In line with the literature, I expect to find an insignificant impact of preferential tariff variations on multilateral trade liberalization within CUs ($\beta_1 + \beta_2 = 0$) where the external trade policy is set jointly. Finally, β_4 might be either negative or positive. On the one hand, the higher the initial MFN tariff, the larger the scope of its potential reduction; but on the other hand, if MFN tariffs are high for a specific reason affecting both the domestic and partner's MFN tariff, the resulting impact is unclear.

In an attempt to address the potential endogeneity issue, in addition to the use of lagged regressors, equation (1) is also estimated using instrumental variables (IV). For each country j, I instrument $PREF_{ij,t-1}$ with $PREF^{m}_{ik,t-1} \equiv min\{\tau^{m \neq j}_{ik,t-1}\}$, namely the minimum preferential tariff rate granted by the two main preferential trading partners of country j ($k = 1, 2$)[8] to any other country ($m \neq j$). Due to the reciprocity in PTAs (see Freund (2003)), the preferential tariffs granted by country j to its partners are likely to be related to those granted by the

[7] In Estevadeordal, Freund and Ornelas (2008), the significant β_2 allows discarding of the hypothesis under which the relationship could be driven by an industry-specific external *third factor* (see Baldwin and Seghezza (2010)) simultaneously affecting preferential and MFN tariffs. In this paper, these factors are captured by the industry-year fixed effect which was not included in Estevadeordal, Freund and Ornelas (2008).

[8] The main preferential trading partners are defined as those receiving from country j the lower average preferential tariff over the whole sample.

trading partners to other countries. Furthermore, the methodology is valid if the preferential tariffs granted by country j's trading partners k to a third country in a given year are not affected by the same factors than those driving country j's own MFN tariffs in the subsequent year. Hence, to satisfy the exclusion restriction, the instrument has to exclude the preferential tariff received by country j.

While the instrumentation of $PREF$ follows Estevadeordal, Freund and Ornelas (2008), the one for D^{MFN} is more challenging. It is indeed difficult to provide an economic instrument that would be independent of the subsequent change in the MFN tariff but correlated with the MFN tariff difference between the considered country and its trading partners. For this reason, I resort to using the value of the dummy variable at the first period of the available data sample, assuming that it is unlikely to be correlated with the error term in (1) in later periods. This instrument is partner-varying due to the changes in trading partners to which the lowest preferential tariff rate is granted. Further, the validity of the instruments is tested using both, over- and under- identification tests, and first-stage regression statistics are reported in Appendix B.

III. Results

A. Baseline Results

Results are reported in Table 1. The first two columns reproduce Estevadeordal, Freund and Ornelas (2008)'s specification excluding the industry-year fixed effect. The coefficient on the lagged change in preferential tariff is positive and statistically significant indicating that the external tariffs tend to fall following a reduction in preferential tariffs. The negative and significant coefficient on the interaction term with the CU dummy indicates that this result does not hold for CUs. However, results are not robust to the inclusion of the industry-year fixed effect, as can be seen in column (3) where both coefficients become insignificant. This *a priori* suggests an absence of a causal relationship between preferential and MFN tariff changes. For this reason, controlling for the level of initial protection turns out to be crucial.

The last three columns display the results for the estimation of (1), using the Ordinary Least Squares (OLS), and Instrumental Variables (IV) including or not industry-year fixed effects. All of them present a positive and statistically significant coefficient on the lagged change in preferential tariff interacted with the MFN dummy. This indicates that following preferential tariff reductions, the MFN tariffs tend to decrease more sharply in high-tariff PTA

TABLE 1
Relationship between MFN Tariff Changes (ΔMFN_t) and Lagged Preferential tariff Changes

		(1)	(2)	(3)	(4)	(5)	(6)
		OLS	IV	IV	OLS	IV	IV
(β_1)	$\Delta PREF_{t-1}$	0.103***	0.152***	-0.032	0.010	0.095**	-0.117
		(4.12)	(3.72)	(-0.42)	(0.58)	(2.04)	(-1.63)
(β_2)	$(\Delta PREF \cdot CU)_{t-1}$	-0.186***	-0.178**	0.157	-0.177***	-0.192**	0.087
		(-5.65)	(-2.26)	(1.11)	(-5.37)	(-2.44)	(0.67)
(β_3)	$(\Delta PREF \cdot D^{MFN})_{t-1}$				0.182***	0.193***	0.297***
					(10.32)	(3.17)	(5.69)
(β_4)	D^{MFN}_{t-1}				-0.840***	-0.763	-0.054
					(-8.10)	(-1.63)	(-0.13)
Country-year FE		YES	YES	YES	YES	YES	YES
Country-industry FE		YES	YES	YES	YES	YES	YES
Industry-year FE		NO	NO	YES	NO	NO	YES
Observations		10'016	10'008	10'008	10'000	9'992	9992
Adjusted R^2		0.644	0.601	-0.273	0.666	0.623	-0.161
N clusters		1'001	997	997	1'000	996	996
Hansen J *P-value*			0.402	0.094		0.557	0.184
Kleibergen-Paap LM *P-value*			0.000	0.000		0.000	0.000
Kleibergen-Paap Wald F stat.			16.488	10.257		20.356	20.971
Test CU *P-value*		0.000	0.708	0.274	0.000	0.241	0.788

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust $t(z)$ statistics in parenthesis adjusted for clustering at the country-industry level. In columns (3) and (6), the full set of fixed effects is *partialled-out* from the other covariates. In (2), (3), (5) and (6), $PREF$ is instrumented by the minimum preferential tariff rate that the two main preferential trading partners grant to other countries excluding j. In (5) and (6), D^{MFN} is instrumented by its value at the first period of the sample. The interaction term is instrumented with the product of the two individual instruments. The Test CU *P-value* reports the *p*-value of testing the significance of the estimated effect within custom unions, ie. the sum of the first two coefficients; $H_0 : \beta_1 + \beta_2 = 0$.

members, which is consistent with the loss of tariff revenue mechanism postulated earlier.

In the preferred specification with the inclusion of industry-year fixed effects, in column (6), the tariff complementarity is exclusively observed in high-tariff countries where a one percentage point decrease in preferential tariffs is followed by a 0.18 percentage fall in the MFN tariff. More importantly, the first coefficient on $\Delta PREF$ tends to be statistically insignificant. Note finally, that the negative and significant β_4 in column (4) may suggest that there is convergence in MFN tariffs across FTA partners occurring within FTAs even when the preferential tariff is fixed. However, the finding is not robust across other specifications.

In all IV estimations, $\Delta PREF_{t-1}$ is instrumented by the changes in preferential tariffs that the two main partner countries grant to a third preferential trading partner. In columns (5) and (6), D^{MFN} is instrumented by its value at the first period of the sample. The interaction term is instrumented with the product of the two individual instruments. In (3) and (6), the number of (excluded and included) instruments exceed the number of clusters and the covariance matrix of moment conditions is rank deficient (see Baum, Schaffer and Stillman (2003, 2007)). As a result, the test of instruments can only be calculated by *partialling-out* all the exogenous fixed effects dummy variables (see Baum, Schaffer and Stillman (2007)).[9] On the one hand, this makes the covariance matrix of full rank, allowing the reporting of the Hansen *J* statistic. On the other hand, the values of the fixed effects dummies are not calculated and the adjusted R^2 becomes very low.[10]

For each IV specification, the Hansen *J* *p*-values do not reject the null hypothesis under which the over-identification restrictions are valid. In addition, the validity of the instruments is supported by the rejection of the null hypothesis of the Kleibergen-Paap *LM* test, which indicates that the model is not underidentified. I furthermore perform the Kleibergen-Paap Wald test for weak instruments in the presence of robust clustered standard errors. The F-statistics of columns (2) and (3) indicate with 95 percent confidence that the bias of the IV estimator relative to the OLS bias is respectively less than 5% and 10%. As Stock and Yogo (2005) do not provide critical values for more than three endogenous variables, the full specification could not be formally tested. Thus, as additional evidence that the instruments are not weak, the first-stage regressions' F-statistics and partial R^2 are reported in Appendix Table B.1. The (Shea) partial R^2 in the D^{MFN} dummy first-stage regressions are relatively low. However, the F-statistics are considerably above 10 in each estimation (between 15 and 42) and for each of the endogenous regressors.

The coefficient on the variable $\Delta PREF \cdot CU$ is negative and significant in (1),(2), (4) and (5), and insignificant when the full set of fixed effects is included. According to the test CU *P*-values, whose null hypothesis is H_0: $\beta_1 + \beta_2 = 0$, within customs unions, the impact of preferential tariff cuts on the subsequent MFN tariff changes turns out to be either negative (OLS) or insignificant (IV). This is consistent with several theoretical findings, in particular with Cadot, De Melo and Olarreaga (1999), Ornelas (2007) and Karacaovali and Limão (2008).

To sum up, Table 2 provides a simplified quantification of the results. Using IV and controlling for all fixed effects, a one percentage point cut in the preferential tariff leads to a

[9]The demeaning technique (*within transformation*) provides similar results in terms of magnitude and significance and are therefore not reported.

[10]Throughout the paper, whenever the fixed effects have to be *partialled-out* from the covariates, the adjusted R^2 becomes very low or negative. However, when keeping all the fixed effects dummies, the adjusted R^2 is much larger, generally very close to the *reduced set of fixed effect* specifications (2) and (5). The paper only reports the *partialled-out* fixed effects estimations in order to discuss the validity of instruments. Note that the value of the coefficients and standard errors are not affected by the estimation method partialling-out, or not, the fixed effect.

subsequent reduction of 0.18 percentage point in high-tariff countries, whereas a significant impact is observed neither in low-tariff countries nor within customs unions.

TABLE 2
Estimated impact of a one percentage point cut in preferential tariff on the subsequent change in MFN tariff (in percentage points)

Specification	Low Tariffs	High Tariffs	CU
Ordinary least squares	-0.010	-0.192	+0.167
Instrumental Variables (IV)	-0.095	-0.288	Insignificant
IV with Full Set of Fixed Effects	Insignificant	-0.179	Insignificant

Source: Author's calculation based on Table 1.

B. Robustness and Extensions

Preference Margin: The magnitude of the preferences is not exclusively determined by the preferential tariff rates. It also depends on the level of the MFN tariffs. If over a given period, the preferential and the MFN tariffs are reduced by the same amount, the preference margin, i.e. the difference between the MFN tariff and the preferential tariff ($MARG_{ijt} = MFN_{ijt} - PREF_{ijt}$), remains constant. As the preference margin changes drive the import response, a constant margin indicates that the subsequent reduction in the MFN tariff is not due to a reinforcement of the granted preference. To control for this effect and capture the importance of the preferences, I estimate (1) by replacing the preferential tariff with the preference margin, using the same set of instruments and associated tests.

Results reported in Table 3 are in line with those of Table 1. First, the constrained model with $\beta_1 + \beta_2 = 0$ is not robust to the inclusion of the full set of fixed effects (column (3)). Second, estimates of the full model controlling for the initial level of MFN protection support the idea whereby the tariff complementarity effect is restricted to high-tariff countries (columns (5) and (6)). Indeed, the negative and significant β_3 coefficients support the tariff complementarity effect as they indicate that a preference margin increase (i.e a preferential tariff reduction for a given level of MFN tariff) is associated with a subsequent reduction in MFN tariff in high-tariff countries. More specifically, the preferred specification in column (6) evidence that in those countries, an increase in the preference margin by 1 percentage point induces a subsequent 0.28 percentage point reduction in the MFN tariff. Finally, most tests of instruments are valid (see Table B.2 for the first-stage statistics) and the impact within CUs remains generally insignificant except in (5) and (6) where we observe tariff substitution

TABLE 3
Relationship between MFN Tariff Changes (ΔMFN_t) and Lagged Changes in Preference Margins

		(1) OLS	(2) IV	(3) IV	(4) OLS	(5) IV	(6) IV
(β_1)	$\Delta MARG_{t-1}$	-0.297***	-0.323***	0.242	-0.210***	-0.155	0.393
		(-13.44)	(-4.37)	(0.56)	(-7.29)	(-1.39)	(0.98)
(β_2)	$(\Delta MARG \cdot CU)_{t-1}$	0.218***	0.356***	-0.330	0.193***	0.336***	-0.113
		(4.08)	(3.64)	(-0.79)	(3.59)	(3.44)	(-0.38)
(β_3)	$(\Delta MARG \cdot D^{MFN})_{t-1}$				-0.095***	-0.383***	-0.669***
					(-3.95)	(-2.95)	(-3.43)
(β_4)	D^{MFN}_{t-1}				-1.173***	-0.750	-0.064
					(-11.59)	(-1.55)	(-0.13)
Country-year FE		YES	YES	YES	YES	YES	YES
Country-industry FE		YES	YES	YES	YES	YES	YES
Industry-year FE		NO	NO	YES	NO	NO	YES
Observations		9,920	9,912	9,912	9,907	9,899	9,899
Adjusted R^2		0.656	0.614	-0.383	0.667	0.610	-0.291
N clusters		1,001	997	997	1,000	996	996
Hansen J *P-value*			0.562	0.220		0.377	0.052
Kleibergen-Paap LM *P-value*			0.000	0.263		0.000	0.051
Kleibergen-Paap Wald F stat.			9.472	0.966		22.696	1.248
Test CU *P-value*		0.103	0.635	0.426	0.669	0.049	0.076

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust $t(z)$ statistics in parenthesis adjusted for clustering at the country-industry level. In columns (3) and (6), the full set of fixed effects is *partialled-out* from the other covariates. In (2), (4) and (5), $MARG$ is instrumented by the minimum preferential tariff rate that the two main preferential trading partners grant to other countries excluding j. In (5) and (6), D^{MFN} is instrumented by its value at the first period of the sample. The interaction term is instrumented with the product of the two individual instruments. The Test CU *P-value* reports the *p*-value of testing the significance of the estimated effect within custom unions, ie. the sum of the first two coefficients; $H_0 : \beta_1 + \beta_2 = 0$.

respectively at the 5% and 10 % levels of significance.

Estimates of Convergence in Tariffs: Although the available data set is bilateral, the estimations carried out so far have not exploited the partner dimension. This is because I am exploring the determinants of a variable that is, by definition, non-discriminatory and therefore partner-invariant. Furthermore, results so far show that the subsequent fall in MFN tariff is sharper when the initial level of external protection is higher than in the partner country. This suggests that PTAs may induce a convergence in MFN tariffs. To check if this is the case, I use the partner dimension of the data set and estimate the impact of the change in the bilateral preferential tariff rate granted by country j to k on the subsequent change in the *external* *tariff gap*, defined as the difference between the MFN tariff set by the reporting country j and the one prevailing in the partner country receiving the preference, k. The estimated equation therefore becomes:

$$\Delta(MFN_{ijt} - MFN_{ikt}) = \gamma_{jt} + \gamma_{kt} + \gamma_{ijk} + \gamma_1 \cdot \Delta\tau^k_{ijt-1} + \gamma_2(\Delta\tau^k_{ijt-1} \cdot CU_{jt-1}) \\ + \gamma_3(\Delta\tau^k_{ijt-1} \cdot D^{MFN_k}_{ijt-1}) + \gamma_4 \cdot D^{MFN_k}_{ijt-1} + u_{ijkt} \quad (4)$$

where MFN_{ikt} is the applied MFN tariff set by the partner country k in industry i at time t, γ_{jt} and γ_{kt} are respectively the reporter-year and partner-year fixed effects controlling for factors, other than the bilateral preferential tariff, that could impact the respective levels of external protection (MFN_{ijt} and MFN_{ikt}), and u_{ijkt} stands for the error term. As for γ_{ijk}, it captures the industry-varying country-pair fixed effect. For country j, the dummy variable D^{MFN_k} is equal to one if the MFN tariff for a given product and year is greater than in the partner country k, ie. if $MFN_{ijt} > MFN_{ikt}$, and zero otherwise.

The results reported in Table 4 show that a reduction in the preferential tariff granted by a country with an initially higher level of external protection is associated with a subsequent fall in the *external tariff gap*, which implies a convergence in MFN tariffs. In low-tariff countries, though, the effect is either insignificant (6) or negative ((4) and (5)). On the one hand, the fact that we can observe an increasing difference in MFN tariffs when the initial level of external protection is lower confirms the convergence in MFN tariffs since in absolute value, the *tariff gap* decreases. On the other hand, this may appear as a form of *tariff substitution*. Indeed, for a given level of partner k's MFN tariff, the reduction in the *tariff gap* implies a rise in the MFN tariff of country j granting the preference. We should nevertheless keep in mind that this might also be explained by a falling MFN tariff in the partner country k receiving the preference.[11]

The positive and significant γ_3, combined with the negative sign of γ_1 in (4) and (5), requires the testing of the null hypothesis $H_0 : \gamma_1 + \gamma_3 = 0$. The D^{MFN} *p*-value rejects the hypothesis that the overall impact in high-tariff countries is zero at 1% in (4) and 5% in (5) and (6). As in the baseline specification, the insignificant coefficients displayed in column (2) and (3) confirm the relevance of controlling for the initial level of MFN tariffs.

In column (3) and (6), I control for the full set of fixed effects by applying a *within transformation* to all variables x individually (see the development in Appendix C). However, in column (6), the instruments do not satisfy the over-identification restrictions (first-stage statis-

[11]The MFN tariff changes in countries receiving preferences is discussed in Crivelli (2013).

TABLE 4
Estimates of Convergence in Tariffs: Changes in MFN Tariff Gap ($\Delta(MFN_{jt} - MFN_{kt})$) and Lagged Preferential Tariff Changes

		(1) OLS	(2) IV	(3) IV $\widetilde{FE}$	(4) OLS	(5) IV	(6) IV $\widetilde{FE}$
(γ_1)	$\Delta\tau_{jk,t-1}$	0.029	-0.001	0.033	-0.113***	-0.213***	-0.025
		(1.58)	(-0.02)	(1.19)	(-8.69)	(-2.99)	(-0.73)
(γ_2)	$(\Delta\tau_{jk} \cdot CU)_{t-1}$	-0.070***	-0.017	-0.046	-0.082***	-0.172	-0.077**
		(-3.11)	(-0.15)	(-1.19)	(-3.89)	(-1.46)	(-2.40)
(γ_3)	$(\Delta\tau_{jk} \cdot D^{MFN_k})_{t-1}$				0.269***	0.687***	0.094**
					(19.19)	(2.93)	(2.10)
(γ_4)	$D^{MFN_k}_{t-1}$				-2.287***	-6.627	-3.254**
					(-25.11)	(-1.55)	(-2.42)
All Fixed Effects		NO	NO	YES	NO	NO	YES
Observations		34,751	24,652	24,757	34,751	24,652	24,757
Adjusted R^2		0.508	0.416	0.004	0.555	0.217	-0.441
N clusters		3,687	2,785	2,890	3,687	2,785	2,890
Hansen J *P-value*			0.737	0.949		0.897	0.001
Kleibergen-Paap LM *P-value*			0.000	0.000		0.002	0.000
Kleibergen-Paap Wald F statistic			38.354	96.321		1.824	4.365
Test CU *P-value*		0.002	0.869	0.580	0.000	0.005	0.002
Test D^{MFN} *P-value*					0.000	0.012	0.029

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust $t(z)$ statistics in parenthesis adjusted for clustering at the country-pair industry level. Reporter-year, partner-year and country-pair-industry fixed effects are included in all regressions. Columns (3) and (6) control for the full set of fixed effect by applying a within transformation to all the variables. In (2), (4) and (5), τ_{jk} is instrumented by the preferential tariff rate that the two other preferential trading partners of country j grant to other countries excluding j and k. In (5) and (6), D^{MFN} is instrumented by its value at the first period of the sample. The interaction term is instrumented with the product of the two individual instruments. The Test CU *P-value* (resp. D^{MFN} *P-value*) reports the *p*-value of testing the significance of the estimated effect within custom unions (resp. high-tariff countries), ie. $H_0 : \gamma_1 + \gamma_2 = 0$ ($H_0 : \gamma_1 + \gamma_3 = 0$).

tics in Appendix Table B.3). In contrast, according to the *p*-values of the Hansen *J* and the Kleibergen-Paap *LM* tests, the instruments are valid in specification (5). In the latter, the effect within CU is significantly different from zero at the 5% level of significance but not significantly different from the impact within low-tariff FTA members as the coefficient on the interaction term between the preferential tariff and the customs union dummy variable is insignificant. As previously explained, this may shed doubts on the causal relationship between preferential and MFN tariffs in those countries as there is no reason for the same forces to apply to low-tariff FTA and CU members.

IV. Discussion and Further Evidence on the Underlying Mechanism

This section provides additional evidence suggesting that the tariff revenue is the channel through which we observe a sharper decline in MFN tariffs within high-tariff PTA members. The mechanism, as suggested earlier, operates first through trade flows and eventually through the loss of tariff revenue. I therefore start by exploring whether this result is more likely to be observed in countries that experience a large increase in imports from preferential partners. Because this would lead to a larger tariff revenue loss, I then explore whether the importer's dependency on tariff revenue as a source of government funding matters.

A. The Impact of Preferential Imports

Exports from low- to high-tariff countries increase as producers arbitrage between prices in different markets. As a result, the reduction in MFN protection in high-tariff countries should be exclusively observed when the reduction in preferential tariffs leads to an increase in the import share from the regional partner.[12] To examine this, I estimate the baseline specification (1) over different subsamples determined by how large the increase in the market share of the preferential partner ($\Delta shtM$) is.[13]

The IV results[14] are reported in Table 5. The left hand side includes observations for which the import share from the regional partner decreases, such that the variation is lower than -0.5 percentage point (column (1)) or simply negative (column (2)). The right hand side shows the impact of lagged preferential tariff changes on subsequent MFN tariff variations when the change in import share is positive (column (3)) or higher than 0.5 and 1 percentage point (columns (4) and (5) respectively.). The β_3 coefficient is increasing in import share variations to the extent that it completely loses its significance whenever the preferential treatment does not result in a rise in import share. This finding is robust to the inclusion of the industry-year fixed effects (Panel B). This therefore strongly supports the idea whereby the tariff complementarity operates through preferential imports. For most specifications, the tests of instru-

[12] As stressed by an anonymous referee, the timing and the duration of the external tariff convergence process is unknown. If the mechanism operates very quickly, a credible threat of trade deflection may be sufficient to induce the government to reduce the MFN tariff and the impact on imports would be limited. I test this hypothesis using a proxy of the *threat* corresponding to the ratio of the partner's exports to the rest of the world (ROW) divided by the imports from ROW. Results, reported in Appendix Tables C.3 and C.4, show that a credible threat significantly strengthen the relationship between preferential and multilateral trade liberalization in high-tariff members of the PTA.

[13] The regional partner directly affected by the reduction in the preferential tariff between time $t-2$ and $t-1$ is the one receiving the lowest preferential tariff rate at the last period $t-1$.

[14] In case of interest, OLS results of Section IV. are reported in Appendix C.

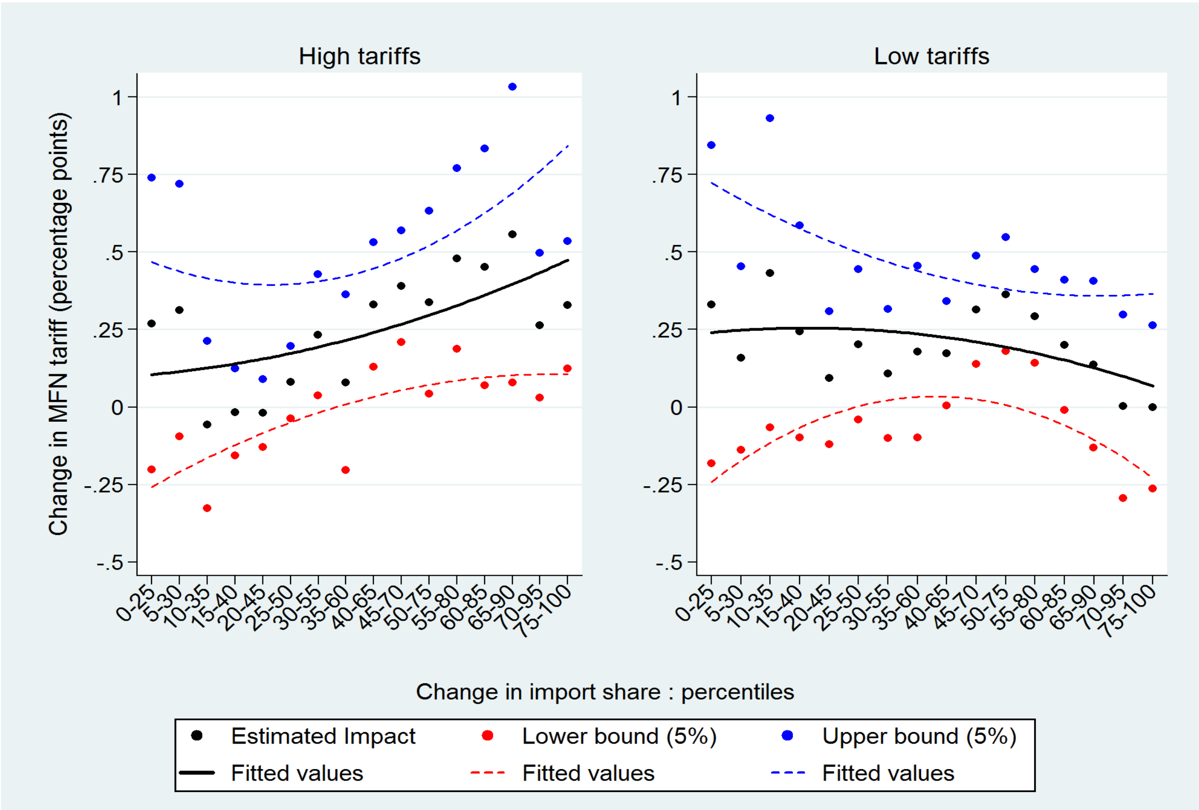
ments are valid either at the 5% or at 10% levels of significance. In line with the literature and with earlier results, the correlation is not significant within customs unions.

TABLE 5
Relationship between MFN Tariff Changes and Lagged Preferential Tariff Changes
Impact of Import Share Changes ($\Delta shtM$)

	$shtM$ decrease (pp)		$shtM$ increase (pp)		
	(1) < -0.5	(2) <0	(3) >0	(4) >0.5	(5) >1
Observations	1,746	3,623	4,076	2,053	1,494
N clusters	514	813	822	537	421
Dependent variable	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t
Panel A: Baseline IV specification					
(β_1) $\Delta PREF_{t-1}$	0.330	0.105	0.156**	0.030	-0.036
	(1.26)	(1.13)	(2.50)	(0.22)	(-0.24)
(β_2) $(\Delta PREF \cdot CU)_{t-1}$	-0.238	-0.071	-0.256***	-0.099	-0.070
	(-0.87)	(-0.54)	(-2.85)	(-0.78)	(-0.49)
(β_3) $(\Delta PREF^R \cdot D^{MFN})_{t-1}$	-0.061	0.034	0.153**	0.301***	0.344***
	(-0.48)	(0.32)	(2.25)	(2.79)	(2.76)
(β_4) D^{MFN}_{t-1}	-3.118**	-1.675*	0.334	2.084	2.076
	(-2.16)	(-1.91)	(0.59)	(1.61)	(0.95)
Adjusted R^2	-0.567	0.556	0.614	0.547	-0.665
Hansen *J P-value*	0.049	0.442	0.728	0.060	0.098
Kleibergen-Paap *LM P-value*	0.087	0.000	0.000	0.000	0.000
Kleibergen-Paap Wald F stat.	1.205	8.085	18.161	7.620	4.790
Test *CU P-value*	0.565	0.803	0.183	0.362	0.471
Panel B: IV including Industry-Year Fixed Effects					
(β_1) $\Delta PREF_{t-1}$	0.107	-0.244	-0.079	-0.171	-0.392
	(0.43)	(-0.67)	(-0.67)	(-1.18)	(-1.57)
(β_2) $(\Delta PREF \cdot CU)_{t-1}$	-0.048	0.176	0.033	0.284	1.901
	(-0.11)	(0.42)	(0.23)	(0.69)	(0.68)
(β_3) $(\Delta PREF^R \cdot D^{MFN})_{t-1}$	-0.165	0.278	0.258***	0.346***	0.543***
	(-0.64)	(1.48)	(3.66)	(3.47)	(3.75)
(β_4) D^{MFN}_{t-1}	-2.370*	0.001	-0.422	-0.258	5.280*
	(-1.67)	(0.00)	(-0.81)	(-0.23)	(1.77)
Adjusted R^2	-3.222	-0.917	-0.651	-2.030	-7.311
Hansen *J P-value*	0.060	0.056	0.289	0.015	0.790
Kleibergen-Paap *LM P-value*	0.005	0.396	0.000	0.008	0.293
Kleibergen-Paap Wald F stat.	1.479	0.412	3.870	1.027	0.327
Test *CU P-value*	0.875	0.788	0.692	0.764	0.570

$^{*}\ p < 0.10$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$. Robust $t(z)$ statistics in parenthesis adjusted for clustering at the country-industry level. Country-year and country-industry fixed effects are included in all regressions. In Panel B as well as in columns (1) and (5) of Panel A, fixed effects are *partialled-out* from the other covariates. $PREF$ is instrumented by the minimum preferential tariff rate that the two main preferential trading partners grant to other countries excluding j and the instrument used for the D^{MFN} variable is its value at the first period of the sample. The interaction term is instrumented with the product of the two individual instruments. The Test CU *P-value* reports the *p*-value of testing the significance of the estimated effect within custom unions, ie. $H_0 : \beta_1 + \beta_2 = 0$.

FIGURE 1
Relationship between MFN and Lagged Preferential Tariff Changes: Impact of Import Share Variations



Note: The baseline IV specification is estimated on sixteen subsamples. A 25-50 interval includes data for which changes in import share lie between the 25th and 50th percentile of the $\Delta shtM$ distribution. Each black dot on the left (right) panel represents the estimate of $\beta_1 + \beta_3$ (β_1), ie. the change in MFN tariff resulting from a one percentage point increase in preferential tariff within high- (low-) tariff countries. The blue and red dots respectively depict the upper and lower confidence bound at the 5% level of significance. The lines represent the quadratic fits across estimates.

Further evidence is provided in Figure 1, which reports the coefficients and confidence intervals of the baseline IV specification[15] estimated on sixteen different subsamples, each of them including 25% of the distribution of the change in import shares. The left hand side shows the sum of the β_1 and β_3 coefficients, ie. the estimated impact in high-tariff countries. The latter is significant for the 30-55 percentile interval of the distribution and thereafter from the 40-65 interval onwards. Hence, tariff-complementarity is mainly observed when the preferential tariff reduction leads to a rise in import shares. This contrasts with low-tariff countries where the impact is mostly insignificant except between the 40th and 80th percentile of

[15]Results are reported for the specification including country-year and country-products fixed effects as in Estevadeordal, Freund and Ornelas (2008), ie. the one reported in column (5) of the benchmark results. When including all fixed effects the validity of the instruments is not verified for most subsamples.

the $\Delta shtM$ distribution, ie. for only four out of the sixteen subsamples. In addition, no clear pattern emerges from this relationship between the β_1 coefficient and the import share variations.

B. The Loss of Tariff Revenue Channel

The evidence so far shows that the heterogeneous impact of preferential tariff changes on MFN tariff cuts is significantly stronger (or exclusively present) in high-tariff countries where the import share from the regional partner increases, suggesting that the mechanism operates through preferential imports. One question, nonetheless, remains to be discussed: what is the mechanism leading from the increasing preferential import shares to the sharper fall in external protection in high-tariff countries? Since the main effect of preferential imports is to deprive the government of tariff revenue, I explore whether the tariff complementarity in high-tariff PTA members is more likely to be observed in countries where the share of tariff revenue in total tax revenue is large. More precisely, I use data extracted from the *OECD Revenue Statistics for Latin American Countries* on the share of customs and import duties in total taxation ($shtTR$) for each country and year to estimate the model on four subsamples divided according to the percentiles of the $shtTR$ distribution – (i) lower than the 25th percentile; (ii) lower than the median; (iii) higher than the median; (iv) higher than the 75th percentile.[16] Summary statistics are reported in Appendix Table A.3.

Table 6 presents the results of the IV estimations. Looking first at the left hand side, ie. countries where the tariff revenue as percentage of total taxation is relatively low, tariff complementarity is still observed through a significant and positive β_1 coefficient. However, β_3 being insignificant, we do not observe heterogeneity between high- and low-tariff countries. Moving to the right hand side of Table 6, the positive relationship between preferential and MFN tariff changes is now exclusively observed in high-tariff countries with a positive and highly significant β_3. This constitutes strong evidence that the impact differential between high- and low-tariff countries is driven by tariff revenue considerations. Interestingly, once controlling for the industry-year fixed effects, we observe some substitution between preferential and applied MFN tariffs in low-tariff members of the trade bloc, suggesting, therefore, that other forces apply. This finding is nevertheless consistent with the literature assessing the impact of preferential on multilateral trade liberalization in developed countries (Limão (2006), Karacaovali and Limão (2008)), where MFN tariffs are lower.

[16]The split is carried out for each year. Results are not significantly affected by the use of a time-invariant split.

TABLE 6

Relationship between MFN Tariff Changes and Lagged Preferential Tariff Changes
Impact of the Share of Customs and Import Duties in Total Tax Revenues ($shtTR$)

	Bottom shares				Top shares			
	25th percentile		50th percentile		50th percentile		75 th percentile	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_{ijt}	ΔMFN_t	ΔMFN_t
					Instrumental Variables			
(β_1) $\Delta PREF_{t-1}$	0.472**	0.240**	0.472**	0.240**	0.004	-0.155**	-0.785**	-0.319**
	(2.29)	(2.26)	(2.29)	(2.26)	(0.05)	(-2.20)	(-2.09)	(-2.27)
(β_1) $(\Delta PREF \cdot CU)_{t-1}$	0.718	-2.800***	0.718	-2.800***	-0.187**	0.008	0.151	0.129
	(0.49)	(-4.66)	(0.49)	(-4.66)	(-2.51)	(0.11)	(0.59)	(1.18)
(β_1) $(\Delta PREF^R \cdot D^{MFN})_{t-1}$	-0.069	0.127	-0.069	0.127	0.368***	0.385***	1.171***	0.439***
	(-0.58)	(1.34)	(-0.58)	(1.34)	(3.11)	(5.69)	(3.22)	(3.44)
(β_1) D^{MFN}_{t-1}	-0.407	-1.169	-0.407	-1.169	-2.098***	-1.013*	3.680*	0.939
	(-0.48)	(-0.92)	(-0.48)	(-0.92)	(-2.86)	(-1.77)	(1.80)	(0.75)
Country-year FE	YES	YES	YES	YES	YES	YES	YES	YES
Country-industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry-year FE	NO	YES	NO	YES	NO	YES	NO	YES
Observations	2,421	2,421	4,724	4,724	5,268	5,268	2,571	2,571
N clusters	378	378	493	493	503	503	389	389
Adjusted R^2	0.463	-1.025	0.623	-0.388	0.579	-0.409	0.346	-1.188
Hansen J *P-value*	0.776	0.064	0.557	0.003	0.494	0.542	0.508	0.362
Kleibergen-Paap LM *P-value*	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000
Kleibergen-Paap Wald F stat.	4.590	2.320	9.710	3.608	11.652	13.379	2.683	4.600
Test CU *P-value*	0.391	0.000	0.896	0.514	0.004	0.002	0.001	0.018
Test D^{MFN} *P-value*	0.006	0.000	0.030	0.000	0.000	0.000	0.001	0.085

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust $t(z)$ statistics in parenthesis adjusted for clustering at the country-industry level. When Industry-year FE are included, the full set of fixed effects is *partialled-out* from the other covariates. $PREF$ is instrumented by the minimum preferential tariff rate that the two main preferential trading partners grant to other countries excluding j and the instrument used for the D^{MFN} variable is its value at the first period of the sample. The interaction term is instrumented with the product of the two individual instruments. The Test CU *P-value* (resp. D^{MFN} *P-value*) reports the *p*-value of testing the significance of the estimated effect within custom unions (resp. high-tariff countries), ie. $H_0 : \beta_1 + \beta_2 = 0$ ($H_0 : \beta_1 + \beta_3 = 0$).

As the first coefficient is negative, the last row of Table 6 reports the *p-value* of testing the total impact in high-tariff countries. The latter is significant at 1% in all specifications except (3) and (8), significant respectively at 5% and 10%. In customs unions, the impact tends to be insignificant when the tariff revenue is relatively low. Finally, instruments are valid in all specifications except column (4) and the negative adjusted R^2 are due to the fact that the full set of fixed effects has been partialled-out from the covariates.[17]

V. Conclusion

The revenue and welfare impact of PTAs depends on subsequent changes in external protection. This paper exploits evidence from various PTAs in ten Latin American countries to provide evidence that initial differences in MFN tariffs crucially affect the subsequent changes in external protection. First, it shows that the magnitude of the decrease in applied MFN tariffs resulting from a reduction in preferential tariffs is restricted to high-tariff PTA members. Among these, the fall in MFN tariffs is larger in countries that experience a large increase in imports from preferential partners, and that rely more heavily on tariff revenue as a source of government funding. Thus, like Bohara, Gawande and Sanguinetti (2004), the paper lends support to the idea that losses in tariff revenue caused by large increases in imports from preferential partners is the channel through which external tariffs decline in high-tariff members of a PTA. Since, as shown by Kemp and Wan Jr (1976) and Panagariya and Krishna (2002), downward adjustments of the MFN tariff can potentially make a trade-diverting PTA welfare-enhancing, this result should alleviate concerns regarding the recent proliferation of PTAs, at least in high-tariff members.

Moreover, if, as suggested here, trade deflection occurs within PTAs, the relative importance assigned to tariff revenues by policy makers may affect the subsequent impact on MFN

[17] I also examined alternative mechanisms. First, a reduced protection case could lead to tariff complementarity but data show that this is unlikely to occur because (i) out of the full sample, only two observations exhibit a sufficiently strong increase in the preferential import share such that the partner becomes the unique supplier ($shtM = 1$), and (ii) the median share of the partner country's total exports out of total domestic imports is relatively low (0.37). Second, according to the rent destruction mechanism described by Ornelas (2005*b*) the finding of this paper could potentially be driven by political contributions. However, using the estimates of the weight the government attaches to social welfare relative to political contributions (a) provided in Gawande, Krishna and Olarreaga (2012), estimation results fail to show the rent destruction mechanism as there is no clear pattern in the way previous findings are affected by the value of a. In addition, this mechanism operates through the *absolute* level of MFN – high or low – and not through the *relative* MFN level – higher or lower than the trading partner, while the two are only slightly correlated (0.116). This also allows ruling out the idea that the main findings of this paper could result from a *mechanical* relation (the higher the MFN tariff, the sharper its potential reduction) making the correlation between the preferential and MFN tariffs more likely to be detected in high-tariff countries. Detailed results are available upon request.

tariffs. This could partly explain the difference in results obtained so far in the empirical literature between studies undertaken for developed countries (Limão (2006), Karacaovali and Limão (2008)) and developing countries (Calvo-Pardo, Freund and Ornelas (2009), Estevadeordal, Freund and Ornelas (2008), Bohara, Gawande and Sanguinetti (2004)) where external protection tends to be higher and tariff revenue considerations stronger (Gawande, Krishna and Olarreaga (2007)).

Viewed in the broader context of the relation between regionalism and multilateralism, the strong compelementarity between preferentaial and applied MFN tariffs restricted to high-preferential partners suggests - or at least is consistent with the idea - that PTAs among developing countries, at least in Latin America, are building blocks for the world trading system.

Appendix A. Data

Based on national data sources and the official texts of the agreements, Estevadeordal, Freund and Ornelas (2008) have converted each tariff reduction programmes into yearly preferential tariffs on a bilateral basis. The most-favoured nation (MFN) applied tariff rates have been collected from various official sources, in particular UNCTAD Trade Analysis and Information System (TRAINS), WTO-Integrated Data Base (IDB), and the Inter-American Development Bank hemispheric tariff database.[18] Data on imports and exports are extracted from the United Nations Commodity Trade Statistics Database (UNComtrade) at the ISIC 4-digit level to match the tariff classification.

TABLE A.1
Included Agreements

FTAs	Partial PTAs
Brazil-Uruguay (1990)	Paraguay-Peru
Argentina-Mexico (1993)	Paraguay-Venezuela
Mexico-Peru (1990-1995)	Colombia-Paraguay
Argentina-Mexico (1993)	Colombia-Uruguay
Mexico-Peru (1990-1995)	Uruguay-Venezuela
Argentina-Paraguay (1990)	Ecuador-Mexico
Argentina-Brazil (1990)	Peru-Uruguay
Chile-Venezuela (1993)	Mexico-Paraguay
Chile-Colombia (1994)	
Ecuador-Uruguay (1994)	
Ecuador-Paraguay (1994)	
Chile-Ecuador (1994)	
MERCOSUR-Chile (1996)	
Chile-Peru (1998)	
Chile-Mexico (1998)	
Brazil-Mexico (2000)	
Argentina-Brazil-Paraguay-Uruguay (MERCOSUR - 1991)	
Mexico-Colombia-Venezuela (1994)	
Brazil-Colombia-Ecuador-Peru-Venezuela (1998)	
Argentina-Colombia-Ecuador-Peru-Venezuela (2000)	
Andean Community (Bolivia-Colombia-Ecuador-Peru-Venezuela; Acuerdo de Cartagena 1969)	
Mexico-United States (NAFTA - 1994)	
Mexico-Canada (NAFTA - 1994)	

The share of customs and import duties in total taxation ($shtTR$) is extracted from the *OECD Revenue Statistics for Latin American Countries*. The weight the government attaches to social welfare relative to political contributions (a) provided by Gawande, Krishna and

[18] For a complete description of the data set, refer to Estevadeordal, Freund and Ornelas (2008).

Olarreaga (2012) is time-invariant and not available for Brazil and Paraguay.

TABLE A.2
Summary Statistics 1990-2001

Variable	NOB	Mean	Standard Error	Median	Min	Max
			Full sample			
MFN_{ijt}	11,001	15.33	8.50	14.30	0.18	117.33
ΔMFN_{ijt}	10,018	-1.19	4.48	0.00	-53.00	39.83
$PREF_{ijt}$	11,124	6.60	8.78	3.23	0.00	85.00
$\Delta PREF_{ijt}$	10,141	-2.21	5.71	-0.01	-85.00	9.30
$MARG_{ijt}$	11,001	8.70	7.17	7.75	0.00	117.33
$\Delta MARG_{ijt}$	10,018	1.03	3.72	0.00	-35.00	75.00
$\Delta shtM_{ijt}^{k_{0,t-1}}$	8664	0.00	0.06	0.00	-1.00	0.94
$D_{abs,ijt}^{MFN}$	11691	0.47	0.50	0.00	0.00	1.00
D_{ijt}^{MFN}	10974	0.47	0.50	0.00	0.00	1.00
D_{ijt}^{MFN}	10,974	0.47	0.50	0.00	0.00	1.00
			High-tariffs ($D^{MFN} = 1$)			
MFN_{ijt}	5,201	18.18	9.88	16.35	1.20	117.33
ΔMFN_{ijt}	4,687	-1.05	4.50	0.00	-35.49	39.83
$PREF_{ijt}$	5,201	7.98	10.70	3.78	0.00	85.00
$\Delta PREF_{ijt}$	4,775	-2.25	6.00	-0.01	-85.00	8.80
$MARG_{ijt}$	5,201	10.20	8.32	9.26	0.00	117.33
$\Delta MARG_{ijt}$	4,687	1.23	4.40	0.00	-35.00	75.00
$\Delta shtM_{ijt}^{k_{0,t-1}}$	4,153	0.00	0.06	0.00	-0.64	0.87
$D_{abs,ijt}^{MFN}$	5,201	0.56	0.50	1.00	0.00	1.00

TABLE A.3
Customs and Import Duties as Percentage of Total Tax Revenue, 1990-2001

Country	NOB	Mean	Standard Error	Median	Min	Max	Welfare Weight a
Argentina	12	3.83	0.91	3.97	2.14	5.01	7.28
Brazil	12	1.64	1.03	1.97	0.00	2.57	-
Chile	12	9.40	1.87	9.69	5.94	12.52	6.37
Columbia	12	6.76	1.90	6.45	5.07	12.08	9.23
Ecuador	12	16.45	3.62	15.74	11.72	24.19	2.49
Mexico	12	4.43	1.48	3.58	2.71	7.07	1.66
Peru	12	10.54	0.89	10.37	9.54	12.45	5.97
Paraguay	12	21.38	8.71	19.36	12.29	39.62	-
Uruguay	12	5.29	1.93	4.38	3.30	9.08	4.92
Venezuela	12	10.84	2.05	10.28	7.29	14.68	6.96
All countries	120	9.06	6.62	8.01	0.00	39.62	5.61

Appendix B. IV First-Stage Regressions : F Statistics and Partial R^2

TABLE B.1
MFN Tariff Changes and Lagged Preferential Tariff Changes

Endogenous Regressor:	$\Delta PREF$	$\Delta PREF \cdot CU$	$\Delta PREF \cdot D^{MFN}$	D^{MFN}
IV Specification (2)				
Shea Partial R^2	0.105	0.243	-	-
Partial R^2	0.122	0.282	-	-
F-Statistic	41.415	37.896	-	-
IV FE Specification (3)				
Shea Partial R^2	0.052	0.089	-	-
Partial R^2	0.063	0.108	-	-
F-Statistic	21.026	31.129	-	-
IV Specification (5)				
Shea Partial R^2	0.096	0.249	0.081	0.044
Partial R^2	0.147	0.287	0.113	0.047
F-Statistic	30.519	25.674	15.641	21.657
IV FE Specification (6)				
Shea Partial R^2	0.052	0.094	0.077	0.040
Partial R^2	0.083	0.113	0.110	0.046
F-Statistic	20.553	20.755	15.685	24.869

TABLE B.2
MFN Tariff Changes and Lagged Changes in Preference Margins

Endogenous Regressor:	$\Delta MARG$	$\Delta MARG \cdot CU$	$\Delta MARG \cdot D^{MFN}$	D^{MFN}
IV Specification (2)				
Shea Partial R^2	0.057	0.123	-	-
Partial R^2	0.104	0.224	-	-
F-Statistic	53.728	63.782	-	-
IV FE Specification (3)				
Shea Partial R^2	0.005	0.015	-	-
Partial R^2	0.027	0.086	-	-
F-Statistic	17.399	46.340	-	-
IV Specification (5)				
Shea Partial R^2	0.055	0.122	0.041	0.039
Partial R^2	0.113	0.225	0.059	0.046
F-Statistic	30.147	41.206	12.064	21.552
IV FE Specification (6)				
Shea Partial R^2	0.055	0.122	0.041	0.039
Partial R^2	0.113	0.225	0.059	0.046
F-Statistic	30.147	41.206	12.064	21.552

TABLE B.3
Estimates of Convergence in MFN Tariffs

Endogenous Regressor:	$\Delta\tau$	$\Delta\tau \cdot CU$	$\Delta\tau \cdot D^{MFN}$	D^{MFN}
IV Specification (2)				
Shea Partial R^2	0.083	0.033	-	-
Partial R^2	0.068	0.026	-	-
F-Statistic	75.286	51.908	-	-
IV $\widetilde{FE}$ Specification (3)				
Shea Partial R^2	0.090	0.118	-	-
Partial R^2	0.125	0.164	-	-
F-Statistic	163.819	95.967	-	-
IV Specification (5)				
Shea Partial R^2	0.041	0.033	0.003	0.001
Partial R^2	0.073	0.027	0.033	0.006
F-Statistic	49.875	33.590	23.158	14.990
IV $\widetilde{FE}$ Specification (6)				
Shea Partial R^2	0.077	0.198	0.031	0.002
Partial R^2	0.169	0.269	0.089	0.003
F-Statistic	128.275	86.619	50.885	4.739

Appendix C.

I. *Within Transformation*

In Section B., where I estimate the convergence in tariffs with bilateral data, the following *within transformation* is applied to overcome software limitation due to the excessive number of variables to be created when using fixed effects dummies:

$$\begin{aligned}\widetilde{x_{ijkt}} =& x_{ijkt} - x_{i...} - x_{.j..} - x_{..k.} - x_{...t} - x_{ijk.} - x_{ij.t} - x_{i.kt} - x_{.jkt} \\ &+ x_{ij..} + x_{i..t} + x_{i.k.} + x_{..kt} + x_{.j.t} + x_{.jk.} + x_{....}\end{aligned} \tag{5}$$

where $x = \Delta(MFN_{ijt} - MFN_{ikt})$, $\Delta\tau^k_{ijt}$, $\Delta\tau^k_{ijt} \cdot CU_{jt}$, $\Delta\tau^k_{ijt} \cdot D^{MFN_k}_{ijt}$, $D^{MFN_k}_{ijt}$. The transformation applies to all variables including instruments. As this transformation eliminates the full set of fixed effects, the estimated equation simplifies to:

$$\begin{aligned}\Delta(MFN\widetilde{_{ijt} - M}FN_{ikt}) =& \gamma_1 \cdot \widetilde{\Delta\tau^k_{ijt}} + \gamma_2(\Delta\tau^k_{\widetilde{ijt} \cdot C}U_{jt-1}) \\ &+ \gamma_3\Delta\tau^k_{\widetilde{ijt} \cdot D}{}^{MFN_k}_{ijt} + \gamma_4 \cdot \widetilde{D^{MFN_k}_{ijt}} + \widetilde{u_{ijkt}}\end{aligned} \tag{6}$$

II. *Preferential Imports and Tariff Revenue Channel: OLS results*

TABLE C.1
Relationship between MFN Tariff Changes and Lagged Preferential Tariff Changes
Impact of Import Share Changes ($\Delta shtM$)

		$shtM$ decrease (pp)		$shtM$ increase (pp)		
		(1) < -0.5	(2) <0	(3) >0	(4) >0.5	(5) >1
Observations		1,955	3,690	4,141	2,258	1,723
N clusters		721	878	885	741	649
Dependent variable		ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t
		Panel A: Baseline OLS specification				
(β_1)	$\Delta PREF_{t-1}$	-0.020	0.007	0.043	-0.040	-0.041
		(-0.35)	(0.20)	(1.39)	(-0.87)	(-0.74)
(β_2)	$(\Delta PREF \cdot CU)_{t-1}$	-0.250*	-0.170**	-0.182***	-0.054	-0.050
		(-1.78)	(-2.06)	(-3.53)	(-0.77)	(-0.50)
(β_3)	$(\Delta PREF^R \cdot D^{MFN})_{t-1}$	0.148***	0.140***	0.149***	0.140***	0.158***
		(2.70)	(4.18)	(6.17)	(4.24)	(3.77)
(β_4)	D^{MFN}_{t-1}	-1.322***	-0.874***	-0.729***	-0.802***	-0.714***
		(-3.58)	(-4.66)	(-4.83)	(-3.50)	(-2.75)
Adjusted R^2		0.674	0.669	0.705	0.722	0.689
Test CU *P-value*		0.024	0.031	0.001	0.102	0.334
		Panel B: OLS including Industry-Year Fixed Effects				
$\Delta PREF_{t-1}$		-0.008	-0.018	-0.011	-0.079	-0.096
		(-0.12)	(-0.46)	(-0.32)	(-1.44)	(-1.03)
$(\Delta PREF \cdot CU)_{t-1}$		-0.259	-0.152*	-0.170***	-0.137	-0.201
		(-1.12)	(-1.77)	(-3.21)	(-1.49)	(-1.16)
$(\Delta PREF^R \cdot D^{MFN})_{t-1}$		0.125**	0.177***	0.185***	0.192***	0.249***
		(2.31)	(5.52)	(8.32)	(4.53)	(4.12)
D^{MFN}_{t-1}		-1.221***	-0.714***	-0.826***	-0.716**	-0.590
		(-3.22)	(-4.06)	(-5.39)	(-2.50)	(-1.29)
Adjusted R^2		0.809	0.748	0.778	0.819	0.819
Test CU *P-value*		0.195	0.042	0.000	0.003	0.027

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust $t(z)$ statistics in parenthesis adjusted for clustering at the country-industry level. Country-year and country-industry fixed effects are included in all regressions. The Test CU *P-value* reports the *p*-value of testing the significance of the estimated effect within custom unions, ie. $H_0 : \beta_1 + \beta_2 = 0$.

TABLE C.2

Relationship between MFN Tariff Changes and Lagged Preferential Tariff Changes

Impact of the Share of Customs and Import Duties in Total Tax Revenues ($shtTR$)

	Bottom shares				Top shares			
	25th percentile		50th percentile		50th percentile		75 th percentile	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_{ijt}	ΔMFN_t	ΔMFN_t
					Ordinary Least Squares			
(β_1) $\Delta PREF_{t-1}$	0.222***	0.206***	0.065**	0.016	-0.034*	-0.111***	-0.061**	-0.147***
	(4.88)	(5.45)	(2.41)	(0.60)	(-1.89)	(-6.57)	(-1.98)	(-4.42)
(β_2) $(\Delta PREF \cdot CU)_{t-1}$	-0.754***	-0.934***	-0.272***	-0.274***	-0.102***	-0.017	-0.107**	0.031
	(-3.32)	(-6.12)	(-3.55)	(-3.74)	(-3.38)	(-0.58)	(-2.57)	(0.64)
(β_3) $(\Delta PREF^R \cdot D^{MFN})_{t-1}$	0.173***	0.142***	0.214***	0.233***	0.140***	0.164***	0.194***	0.182***
	(4.27)	(5.08)	(8.57)	(10.50)	(6.79)	(9.97)	(6.65)	(6.16)
(β_4) D_{t-1}^{MFN}	-1.074***	-1.480***	-0.470***	-0.837***	-1.272***	-0.894***	-1.347***	-1.098***
	(-4.21)	(-8.76)	(-3.33)	(-6.69)	(-8.46)	(-7.04)	(-6.59)	(-5.89)
Country-year FE	YES	YES	YES	YES	YES	YES	YES	YES
Country-industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry-year FE	NO	YES	NO	YES	NO	YES	NO	YES
Observations	2,421	2,421	4,725	4,725	5,271	5,271	2,572	2,572
N clusters	378	378	493	493	503	503	389	389
Adjusted R^2	0.541	-0.756	0.636	-0.306	0.625	-0.301	0.643	-0.999
Test CU *P-value*	0.016	0.000	0.004	0.000	0.000	0.000	0.000	0.002
Test D^{MFN} *P-value*	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.336

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust $t(z)$ statistics in parenthesis adjusted for clustering at the country-industry level. The Test CU *P-value* (resp. D^{MFN} *P-value*) reports the p-value of testing the significance of the estimated effect within custom unions (resp. high-tariff countries), ie. $H_0 : \beta_1 + \beta_2 = 0$ ($H_0 : \beta_1 + \beta_3 = 0$).

III. ***Credible Threat of Trade Deflection***

I proxy the potential threat of trade deflection of the partner country k_0 receiving the lowest preferential tariff rate from country j by its exports to the rest of the world divided by country j's imports from the rest of the world (ROW), for a given industry i and year t. The higher this ratio, the more credible the threat of trade deflection.

$$Threat_{jit} = \frac{Exports_{k_0 it}^{ROW}}{Imports_{jit}^{ROW}} \tag{7}$$

Results of Table C.3 show that for relatively high levels of external protection, the tariff complementarity is much lower or even insignificant when the threat is not credible. Indeed, the β_3 coefficient rises in the *Threat* ratio reflecting an increasing impact differential between high- and low-tariff countries.

TABLE C.3
Relationship between MFN tariff changes and Lagged Preferential Tariff Changes
Impact of a Potential Threat of Trade Deflection, $\frac{X^k_{ROW}}{M^j_{ROW}}$

	Non-credible Threat (bottom percentiles)				Credible Threat (top percentiles)			
	25th percentile		50th percentile		50th percentile		75 th percentile	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t
				Instrumental Variables				
(β_1) $\Delta PREF_{t-1}$	0.226**	0.227	0.257***	-0.081	0.088	-0.214	0.030	-0.198
	(2.22)	(1.10)	(3.66)	(-0.60)	(0.99)	(-1.43)	(0.21)	(-0.86)
(β_2) $(\Delta PREF \cdot CU)_{t-1}$	-0.090	-0.089	-0.154	0.231	-0.360***	0.092	-0.292*	-0.083
	(-0.53)	(-0.28)	(-0.85)	(0.82)	(-3.30)	(0.59)	(-1.72)	(-0.38)
(β_3) $(\Delta PREF^R \cdot D^{MFN})_{t-1}$	0.019	-0.016	-0.030	0.254***	0.261***	0.340***	0.358***	0.375***
	(0.16)	(-0.08)	(-0.30)	(2.80)	(2.81)	(3.76)	(2.82)	(3.23)
(β_4) D^{MFN}_{t-1}	0.447	1.103	-0.590	0.144	0.055	0.311	-0.311	1.820
	(0.34)	(0.50)	(-0.89)	(0.26)	(0.05)	(0.29)	(-0.17)	(0.86)
Country-year FE	YES	YES	YES	YES	YES	YES	YES	YES
Country-industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry-year FE	NO	YES	NO	YES	NO	YES	NO	YES
Observations	2,091	2,091	4,317	4,317	4,177	4,177	1,829	1,829
N clusters	424	424	678	678	657	657	348	348
Adjusted R^2	-0.259	-1.635	0.553	-0.467	0.661	-0.613	0.678	-1.446
Hansen J *P-value*	0.360	0.561	0.760	0.521	0.019	0.050	0.110	0.031
Kleibergen-Paap LM *P-value*	0.007	0.061	0.000	0.000	0.000	0.000	0.001	0.003
Kleibergen-Paap Wald F stat.	2.264	0.913	6.324	4.492	8.543	5.891	3.325	1.527
Test CU *P-value*	0.463	0.680	0.612	0.495	0.000	0.193	0.011	0.026

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust $t(z)$ statistics in parenthesis adjusted for clustering at the country-industry level. $PREF$ is instrumented by the minimum preferential tariff rate that the two main preferential trading partners grant to other countries excluding j and the instrument used for the D^{MFN} variable is its value at the first period of the sample. The interaction term is instrumented with the product of the two individual instruments. The Test CU *P-value* (resp. D^{MFN} *P-value*) reports the *p*-value of testing the significance of the estimated effect within custom unions (resp. high-tariff countries), ie. $H_0 : \beta_1 + \beta_2 = 0$ ($H_0 : \beta_1 + \beta_3 = 0$).

TABLE C.4

Relationship between MFN tariff changes and Lagged Preferential Tariff Changes

Impact of a Potential Threat of Trade Deflection, $\frac{X^k_{ROW}}{M^j_{ROW}}$

	Non-credible Threat (bottom percentiles)				Credible Threat (top percentiles)			
	25^{th} percentile		50^{th} percentile		50^{th} percentile		75^{th} percentile	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t	ΔMFN_t
					Ordinary Least Squares			
(β_1) $\Delta PREF_{t-1}$	0.100***	-0.030	0.062***	-0.043	0.015	-0.008	-0.003	-0.016
	(3.54)	(-0.79)	(2.91)	(-1.52)	(0.39)	(-0.20)	(-0.05)	(-0.31)
(β_2) $(\Delta PREF \cdot CU)_{t-1}$	-0.278***	-0.239**	-0.236***	-0.187**	-0.185***	-0.116**	-0.150	-0.113
	(-3.39)	(-1.97)	(-4.61)	(-2.52)	(-3.18)	(-2.08)	(-1.62)	(-1.18)
(β_3) $(\Delta PREF^R \cdot D^{MFN})_{t-1}$	0.144***	0.208***	0.166***	0.212***	0.149***	0.156***	0.179***	0.172***
	(4.95)	(6.97)	(7.46)	(10.54)	(4.53)	(5.49)	(3.61)	(3.90)
(β_4) D^{MFN}_{t-1}	-0.561***	-0.356*	-0.462***	-0.349**	-0.993***	-1.138***	-0.951***	-1.002***
	(-3.40)	(-1.85)	(-3.11)	(-2.38)	(-5.07)	(-5.35)	(-2.99)	(-2.77)
Country-year FE	YES	YES	YES	YES	YES	YES	YES	YES
Country-industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry-year FE	NO	YES	NO	YES	NO	YES	NO	YES
Observations	2,208	2,208	4,382	4,382	4,353	4,353	2,034	2,034
N clusters	541	541	743	743	829	829	549	549
Adjusted R^2	0.686	0.800	0.657	0.735	0.728	0.776	0.763	0.821
Test CU *P-value*	0.025	0.023	0.000	0.001	0.000	0.006	0.037	0.122

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust $t(z)$ statistics in parenthesis adjusted for clustering at the country-industry level. The Test CU *P-value* (resp. D^{MFN} *P-value*) reports the *p*-value of testing the significance of the estimated effect within custom unions (resp. high-tariff countries), ie. $H_0 : \beta_1 + \beta_2 = 0$ ($H_0 : \beta_1 + \beta_3 = 0$).

References

Bagwell, K., and RW. Staiger. 1999. “Regionalism and Multilateral Tariff Cooperation.” In *International Trade Policy and the Pacific Rim.* , ed. J. Pigott and A. Woodland, 157–185. St. Martin’s Press (New York).

Baldwin, R. 2009. “Big-Think Regionalism: A Critical Survey.” In *Regional Rules in the Global Trading System.* , ed. A. Estevadeordal, K. Suominen and R.R. Teh, 17–95. Cambridge University Press.

Baldwin, R.E., and E. Seghezza. 2010. “Are Trade Blocs Building or Stumbling Blocs?” *Journal of Economic Integration*, 25(2): 276–297.

Baum, C.F., M.E. Schaffer, and S. Stillman. 2003. “Instrumental Variables and GMM: Estimation and Testing.” *Stata Journal*, 3(1): 1–31.

Baum, C.F., M.E. Schaffer, and S. Stillman. 2007. “Enhanced Routines for Instrumental Variables/GMM Estimation and Testing.” *Stata Journal*, 7(4): 465–506.

Bohara, A.K., K. Gawande, and P. Sanguinetti. 2004. “Trade Diversion and Declining Tariffs: Evidence From Mercosur.” *Journal of International Economics*, 64(1): 65–88.

Cadot, O., J. De Melo, and M. Olarreaga. 1999. “Regional Integration and Lobbying for Tariffs against Nonmembers.” *International Economic Review*, 40(3): 635–658.

Calvo-Pardo, H., C. Freund, and E. Ornelas. 2009. “The ASEAN Free Trade Agreement: Impact on Trade Flows and External Trade Barriers.” In *Costs and Benefits of Regional Economic Integration.* , ed. R. Barro and J-W. Lee. Oxford University Press.

Crivelli, P. 2013. “Regionalism and External Protection: Preferences Received Matter.” *Geneva School of Economics and Management, forthcoming working paper.*

Estevadeordal, A., C. Freund, and E. Ornelas. 2008. “Does Regionalism Affect Trade Liberalization toward Nonmembers?” *The Quarterly Journal of Economics*, 123(4): 1531.

Freund, C. 2000. “Multilateralism and the Endogenous Formation of Preferential Trade Agreements.” *Journal of International Economics*, 52(2): 359–376.

Freund, C. 2003. “Reciprocity in Free Trade Agreements.” *World Bank Policy Research Working Paper*, 3061.

Freund, C., and E. Ornelas. 2010. "Regional Trade Agreements." *Annual Review of Economics*, 2(1): 139–166.

Gawande, K., P. Krishna, and M. Olarreaga. 2007. "A Political-Economic Account of Protection in Developing Countries." *Unpublished working paper.*

Gawande, K., P. Krishna, and M. Olarreaga. 2012. "Lobbying Competition Over Trade Policy." *International Economic Review*, 53(1): 115–132.

Grossman, G.M., and E. Helpman. 1995. "The Politics of Free-Trade Agreements." *The American Economic Review*, 85(4): 667–690.

Karacaovali, B., and N. Limão. 2008. "The Clash of Liberalizations: Preferential vs. Multilateral Trade Liberalization in the European Union." *Journal of International Economics*, 74(2): 299–327.

Kemp, M.C., and H. Wan Jr. 1976. "An Elementary Proposition Concerning the Formation of Customs Unions." *Journal of international economics*, 6(1): 95–97.

Krishna, P. 1998. "Regionalism and Multilateralism: A Political Economy Approach." *The Quarterly Journal of Economics*, 113(1): 227.

Levy, P.I. 1997. "A Political-Economic Analysis of Free-Trade Agreements." *The American Economic Review*, 506–519.

Limão, N. 2006. "Preferential Trade Agreements as Stumbling Blocks for Multilateral Trade Liberalization: Evidence for The United States." *The American Economic Review*, 96(3): 896–914.

Limão, N. 2007. "Are Preferential Trade Agreements with Non-Trade Objectives a Stumbling Block for Multilateral Liberalization?" *Review of Economic Studies*, 74(3): 821–855.

Ornelas, E. 2005*a*. "Endogenous Free Trade Agreements and the Multilateral Trading System." *Journal of International Economics*, 67(2): 471–497.

Ornelas, E. 2005*b*. "Rent Destruction and the Political Viability of Free Trade Agreements." *The Quarterly Journal of Economics*, 120(4): 1475.

Ornelas, E. 2007. "Exchanging Market Access at the Outsiders' Expense: The Case of Customs Unions." *Canadian Journal of Economics/Revue canadienne d'économique*, 40(1): 207–224.

Ornelas, E. 2012. "Preferential Trade Agreements and the Labor Market." *CEPR Discussion Papers.*

Panagariya, A., and P. Krishna. 2002. "On Necessarily Welfare-Enhancing Free Trade Areas." *Journal of International Economics,* 57(2): 353–367.

Richardson, M. 1993. "Endogenous Protection and Trade Diversion." *Journal of International Economics,* 34(3-4): 309–324.

Richardson, M. 1995. "Tariff Revenue Competition in a Free Trade Area." *European Economic Review,* 39(7): 1429–1437.

Stock, J.H., and M. Yogo. 2005. "Testing for Weak Instruments in Linear IV Regression." In *Identification And Inference For Econometric Models: Essays In Honor Of Thomas Rothenberg.* 80–108. Cambridge University Press.

World Trade Organization. 2011. "World Trade Report 2011 - The WTO and preferential trade agreements: From co-existence to coherence." Available at: http://www.wto.org/english/res_e/booksp_e/anrep_e/world_trade_report11_e.pdf, Accessed: July 2014.