Preferential Trade Agreements and Antidumping Protection*

Chrysostomos Tabakis
KDI School of Public Policy and Management

Maurizio Zanardi
Lancaster University Management School

July 2019

Abstract

Are preferential trade agreements (PTAs) stumbling blocks or building blocks towards multilateral trade liberalization? We address this question by investigating the effects of the negotiation and implementation of PTAs on the use of antidumping (AD) (i.e., the most common form of contingent trade protection) by member countries against non-members as there has been a concurrent surge in regionalism and AD activity since the 1990s. Theoretically-derived empirical predictions are supported by the empirical analysis based on the 15 most intense users of AD. The results demonstrate that both the negotiation and the implementation of PTAs lead to fewer AD measures against non-member countries, except for members of customs-union agreements in force facing large import surges from non-members. Thus, our results highlight a building-block effect of PTAs on multilateral trade cooperation when it comes to AD protection.

Keywords: Preferential trade agreements; antidumping; multilateral cooperation.
JEL classification: F13; F14; F15.

*The authors would like to thank Haftom Teferi, Araya Mebrahtu Teka, Luis Carlos Vargas Bolivar, and Alisa Yusupova for excellent research assistance. The authors would also like to thank Ralph Ossa (Editor), two anonymous referees, Chad Bown, Xianwen Chen, Paola Conconi, James Lake, Mark Melatos, Emanuel Ornelas, Jee-Hyeong Park, Pascalis Raimondos, John Romalis, Keuk-Je Sung, Patricia Tovar, and participants at an FIW Workshop (Vienna), a workshop of the Asia Global Institute (Hong Kong), the conference on the "Economics of Global Interactions" (Bari), the Asia–EU Cooperation Seminar on "Globalization at the Crossroads: Current Challenges and Future Prospects" (Seoul), the Econometric Society Australasian Meeting (Auckland), the European Trade Study Group Conference (Florence), the GEP China Conference on "China and the Unravelling of Globalisation" (Ningbo), the Midwest International Trade Conference (Dallas), the Seminar on Asia and Pacific Economies (Suzhou), the Trade, Integration and Growth Network Conference (Lima), and seminars at Kyung Hee University Institute of International Studies, Queensland University of Technology, Seoul National University, Sogang University, and the University of Sydney for very helpful comments and suggestions. Chrysostomos Tabakis gratefully acknowledges financial support from the KDI School of Public Policy and Management.
Corresponding author: Maurizio Zanardi: Lancaster University Management School, Department of Economics, Bailrigg, Lancaster LA1 4YX, United Kingdom. Telephone: +44–1524–593819. E-mail: m.zanardi@lancaster.ac.uk

1 Introduction

The world has witnessed an astounding proliferation of preferential trade agreements (PTAs) since the early 1990s. According to the World Trade Organization (WTO), as of April 2019, the number of notified active PTAs stood at 294, with every WTO member being part of at least one PTA in force.[1] And this figure is in fact likely to increase in the near future as many WTO members are currently involved in negotiations for new PTAs. The sheer number of such agreements has generated a large body of literature, started by Bhagwati (1991), analyzing whether PTAs are "building blocks" or "stumbling blocks" towards multilateral trade liberalization, which would be the first-best policy.[2] A second major trend that has dominated international commercial policy over the same period is the dramatic increase in antidumping (AD) activity. Although the stated objective of AD is to eliminate the injurious effects of dumping (i.e., exporting a product at less than "fair" value), AD activity in practice has nothing to do with maintaining a fair trading environment. AD "is simply a modern form of protection" (Blonigen and Prusa, 2003), being nowadays employed on a regular basis by many developed and developing countries alike.[3]

Since AD measures can provide governments with a flexible trade policy instrument at a time when WTO commitments severely constrain the use of most-favored-nation (MFN) tariffs, it is natural to ask whether the building- or stumbling-block effect of PTAs might manifest itself (also) through the use of such measures. This natural question has not received much attention in the literature up to now, although in his recent survey article on PTAs, Limão (2016) does point out that the interdependence of PTAs and non-tariff barriers against non-member countries is an important avenue for future research. This is the objective of this empirical paper, which aims to shed light on the ramifications of PTAs for their member countries' extra-PTA AD activity (i.e., the AD activity of PTA members against non-members).

A number of theoretical contributions have looked at whether PTAs help or hinder mul-

[1] See http://rtais.wto.org/UI/charts.aspx.

[2] See Freund and Ornelas (2010) and Limão (2016) for a survey of the literature on PTAs.

[3] Economists would agree that AD is justified in the case of predatory dumping, the objective of which is for a foreign exporter to gain a dominant position in the domestic market by driving out competition. However, such predatory motives are absent in most AD cases, and in any case, the introduction of AD measures does not hinge upon their existence.

tilateral trade liberalization. However, the theoretical literature on this question remains largely inconclusive as the answer depends on the modeling assumptions. This makes the empirical investigation of this issue all the more relevant. To guide our empirical strategy for identifying the relationship between PTAs and AD, we rely on the theoretical work by Tabakis (2010, 2015). These papers explore the implications of the (symmetric) formation of, respectively, customs unions (CUs) and free-trade areas (FTAs) for contingent protection. Both papers employ a dynamic game of trade-policy setting, in which countries are limited to self-enforcing cooperative multilateral agreements—as is common in the literature—and the economic environment is characterized by exogenous trade-volume volatility. In terms of AD measures, which are the focus of our paper, three testable predictions emerge from Tabakis (2010, 2015): (i) the number of AD measures of members against non-members of an FTA agreement should decrease both during its negotiation and after its implementation; (ii) the number of AD measures of members against non-members of a CU agreement should decrease during its negotiation; and (iii) the number of AD measures of members against non-members of a CU agreement should increase following its implementation for "high" import volumes from non-member countries, whereas the reverse should be true for "low" volumes of imports.

To empirically test these predictions, we have built a novel dataset comprising detailed data for many PTAs. In particular, the testing of our predictions requires information on the dates of the launch of negotiations for the different PTAs in our sample and of their entry into force. Using then AD data—and considering also other contingent measures—over the period 1980–2015 and implementing different econometric strategies, our results do provide clear support to the aforementioned theoretical predictions. Both the negotiation and the implementation of PTAs have a significant effect on the extent of AD use by PTA members against non-member countries. What is more important, PTAs generally have a dampening effect on their members' AD activity against the rest of the world, except when members of an implemented CU agreement face substantial import growth from non-member countries, exactly as predicted by the theoretical model of Tabakis (2010). In brief, our results suggest that with one notable exception (namely, CUs in force facing a substantial growth of extra-CU imports), PTAs are building blocks towards multilateral trade cooperation as far as AD protection is concerned.

Our paper contributes to the empirical literature on the ramifications of PTAs for multilateral trade liberalization, focusing on non-tariff barriers to trade. Some studies provide evidence in support of a building-block effect of PTAs (e.g., Estevadeordal et al., 2008), whereas others offer evidence showing that PTAs are stumbling blocks towards tariff liberalization at the multilateral level (e.g., Limão, 2006; Karacaovali and Limão, 2008). The paper by Estevadeordal et al. (2008), which also makes a distinction between FTAs and CUs, is probably the closest to ours (at least) as far as results are concerned. Their findings suggest that FTAs produce a building-block effect, while CUs are characterized by a considerably smaller reduction, if at all, in members' MFN tariffs than FTAs, which is very much in line with our findings. Our work complements these (and other) papers by highlighting that AD (i.e., the most important non-tariff barrier) constitutes a different channel through which PTAs affect multilateral trade cooperation. In other words, we demonstrate that in order to get a more thorough picture regarding the implications of regionalism for the multilateral trading system, other policy instruments besides MFN tariffs should be taken into consideration.

In relation to the interplay specifically between PTAs and AD use, only four papers (to the best of our knowledge) examine the empirical effects of PTAs on AD using cross-country evidence. Ahn and Shin (2011) look at the effect of FTAs on the intra-FTA AD filings of major AD users over 1995–2009 and find that FTAs negatively affect the number of AD investigations between FTA partners. Silberberger and Stender (2018) explore the impact of PTAs on the bilateral use of AD measures over the period 1991–2014 while explicitly considering the degree of intra-block tariff liberalization. They show that PTAs reduce in general the likelihood of AD activity between PTA members, but an improvement in the relative tariff treatment between PTA partners results in a higher likelihood of bilateral AD activity than an equal improvement between non-integration trade partners. By contrast, Prusa and Teh (2010), in a paper which is quite close in spirit to ours, investigate the ramifications of PTAs for both intra-PTA AD filings and AD filings against non-member countries. They find that AD provisions in PTAs decrease the incidence of intra-PTA AD cases but lead to an increase in the number of members' filings against non-member countries. Postponing the discussion on the discrepancy between the latter result and our findings, it is important to stress at this point that our paper differs from these previous studies in two major respects. First, we explore

the impact of PTAs on the use of AD protection not only after their implementation but also during their negotiation, clearly distinguishing between the two phases. Second, we allow for differential effects between FTAs and CUs. As the theoretical models by Tabakis (2010, 2015) suggest and our empirical analysis verifies, making both distinctions is critical in order to get deeper insights into the ramifications of PTAs for AD protection. Finally, Bown and Tovar (2016) examine whether the trade integration of Argentina and Brazil within the context of MERCOSUR over 1990–2001 produced a building-block or a stumbling-block effect, while taking into consideration both MFN tariffs and contingent protection (AD and safeguards). They conclude that it is important to consider trade barriers beyond MFN tariffs in order to properly characterize the relationship between preferential liberalization and liberalization towards third countries (i.e., non-member countries). They further conclude that there was no effect during the years MERCOSUR was an FTA, while they provide evidence of a significant stumbling-block effect once MERCOSUR evolved into a CU (i.e., during 1995–2001). In comparison with Bown and Tovar (2016), we use a much broader sample of countries and a longer sample period as well as look at the cooperation effects of PTAs while being negotiated, aiming to provide a comprehensive picture of the implications of PTAs for the world trading system.

The remainder of the paper is organized as follows. Section 2 provides a non-technical presentation of the theoretical framework that can be used to analyze the impact of regionalism on the employment of contingent protection. Section 3 discusses the empirical predictions that follow from this framework and how they can be econometrically tested. Section 4 is dedicated to the description of the data. The empirical results are presented in Section 5, together with a quantification of their implications for the use of AD and several robustness checks. Section 6 concludes.

2 Theoretical Framework

The main goal of this paper is to empirically examine the impact of PTAs on their members' extra-PTA AD activity (i.e., the AD activity of PTA members against non-member countries) and thereby contribute to our understanding of whether PTAs are building blocks or stumbling

blocks towards multilateral trade liberalization. To this end, we rely on the theoretical work by Tabakis (2010, 2015) to derive testable predictions. Tabakis (2010) looks at the ramifications of symmetric CU formation for multilateral trade cooperation, while the companion paper, Tabakis (2015), focuses on FTAs.

The analysis in both papers rests on three main assumptions. First, as is common in the literature on trade agreements, countries are limited to self-enforcing multilateral agreements (i.e., agreements that balance for each country its short-term terms-of-trade gains from defection from the agreed-upon policies against the long-term welfare losses due to its trade partners' retaliation).[4] Second, countries face every period exogenous trade-volume shocks. As a result, "special" protection (or contingent protection—the two terms will be used interchangeably below) becomes an indispensable *on-equilibrium-path* safety valve, facilitating and preserving multilateral cooperation within a volatile trading environment. More specifically, a trade agreement should allow countries to temporarily raise their cooperative level of protection—via using special protection—when facing significant import-volume surges so that their potential one-time gains from defection are sufficiently lowered, safeguarding multilateral trade cooperation.[5] Third, as in Bagwell and Staiger (1997a, b), the countries' trading relationship passes through three phases: an initial phase, a PTA-negotiations (or transition) phase during which different PTAs are contemporaneously under negotiation, and a final phase in which the PTAs in question are in force. This assumption is driven by the realities of regionalism as the negotiation, signing, ratification, and finally full implementation of a PTA tends to be a lengthy process.[6] In its earlier stages, member and non-member countries are faced with changes mainly (or only) in terms of expected future trade conditions rather than current ones, which implies that the relationship between regionalism and multilateral trade cooperation is non-stationary. Modeling therefore explicitly the PTA-negotiations phase is essential for a complete analysis of the ramifications of PTAs for the multilateral trading system over time.

[4] See Bagwell and Staiger (2002) for an in-depth analysis of enforcement issues within the context of the GATT/WTO.

[5] See the seminal work by Bagwell and Staiger (1990) for further elaboration on this result. Bown and Crowley (2013a) provide empirical evidence in support of this theoretical prediction.

[6] For the PTAs in force included in our main analysis, about 8 years passed on average between the launch of their negotiation and their entry into force.

Tabakis (2010) demonstrates, in the context of a symmetric competing-importers model, that the parallel initiation of different CU negotiations results in a reduction in multilateral trade tensions, especially as far as the use of contingent trade instruments is concerned. Intuitively, this is due to the market-power effect of CU establishment, which stems from the harmonization of the member countries' external trade policies. In particular, a CU, in comparison with any of its individual member states, can affect world prices to a greater extent (i.e., has more market power) and is, therefore, in a position to punish more severely any defection from the cooperative path.[7] As a result, as countries enter (symmetrically) into CU negotiations and the establishment of different CUs becomes (more) likely, the expected discounted cost of a future trade war increases. On the other hand, the mere launch of CU negotiations has no impact on the existing trade conditions and thereby on countries' static incentive to defect from the cooperative path of play. Thus, relative to the pre-CU-negotiations period, a more liberal multilateral trading environment is now feasible as countries are less inclined to revert to protectionist strategies, violating multilateral cooperation.

This pro-cooperation effect of CU formation on the multilateral trading system is, however, temporary. After the conclusion of the negotiations and the entry into force of the CU agreements, countries' static incentive to deviate from the cooperative path also intensifies, leading to the reemergence of a more protectionist trading environment. The reason is that the CUs are in a better position to manipulate the terms of trade to their advantage relative to any of their individual member states. An important finding that emerges from the analysis of Tabakis (2010) is that in comparison with the pre-CU world (i.e., a world where no prospective CU negotiations are on the horizon), the use of contingent protection in the post-CU world is, on the one hand, more severe for high volumes of imports, but is, on the other hand, less frequent overall in the sense that a higher import-volume surge is required to warrant the employment of contingent trade instruments (on the equilibrium path).

These theoretical results are illustrated in Figure 1, which depicts the most cooperative symmetric equilibrium of the three-phase CU game. More specifically, $\widehat{\tau}^c$ represents the most cooperative level of protection that a country can sustain vis-à-vis any non-CU trade part-

[7] For empirical evidence that trade policy formulation is significantly affected by terms-of-trade or market-power motivations, see Broda et al. (2008) and Bagwell and Staiger (2011).

ner as a function of the bilateral free-trade import volume, which is subject to exogenous shocks—for tractability, these are assumed to be the same in any given period across all different importer–exporter country pairs. Notice that $\overline{e}$ refers to the critical bilateral (free-trade) import-volume threshold above which the employment of contingent protection becomes necessary in order to safeguard multilateral cooperation. Considering the various phases the countries' trading relationship passes through, $\widehat{\tau}_1^c$ represents the (most cooperative) equilibrium trade-protection function in the pre-CU world, while $\widehat{\tau}_2^c$ refers to the corresponding one during the CU-negotiations phase. As $\widehat{\tau}_2^c$ is to the right of and parallel to the original curve, this implies that above the threshold $\overline{e}_1$, the same level of imports results in less contingent protection once countries enter into CU talks. However, once the different CUs are implemented, the $\widehat{\tau}^c$ curve shifts to the left and becomes steeper (see $\widehat{\tau}_3^c$). Therefore, as compared with the pre-CU world, less (more) protectionist trade policies are implemented at the multilateral level (i.e., between non-CU trade partners) in the post-CU world for low (high) import volumes.

In his follow-up paper, Tabakis (2015) explores the implications of FTA agreements for special protection in the context of a model similar to the aforementioned one (more precisely, within a symmetric competing-importers model). He shows that the parallel creation of different FTAs results in a gradual but permanent reduction in trade tensions at the multilateral level, with this effect being more pronounced for special protection such as AD measures rather than for MFN tariffs. The intuition underlying this finding is straightforward. The FTA agreements induce trade diversion, lowering the volume of trade between FTA partners and non-partner countries (while raising intra-block trade). This weakens countries' static incentive to defect from the cooperative path of play, enabling them to sustain multilaterally more cooperative trade policies (i.e., less protectionist ones) once the FTA agreements enter into force. In fact, a relatively liberal environment can be maintained also during the FTA negotiations as the *prospective* emergence of different FTAs with the accompanying reduction in multilateral trade barriers raises the expected discounted value of future cooperation, without affecting the short-term terms-of-trade gains from increased protection (as FTA negotiations have no effect on the existing trade patterns).

The theoretical results regarding FTAs can be illustrated in the same way as the ones for

CUs. Figure 2 shows such a graphical representation of the results, where the $\widehat{\tau}^c$ curves are analogous to the ones in Figure 1. As in the CU scenario, $\widehat{\tau}_2^c$ lies to the right of $\widehat{\tau}_1^c$, but $\widehat{\tau}_3^c$ is now farther to the right and flatter than both $\widehat{\tau}_1^c$ and $\widehat{\tau}_2^c$. Thus, there is a gradual but continuous abatement of protectionism at the multilateral level as countries negotiate and then implement different FTA agreements.

In sum, the theoretical work by Tabakis (2010, 2015) offers insights into the impact of PTAs on countries' ability to multilaterally cooperate within a volatile trading environment and while being limited to self-enforcing multilateral trade agreements. It is important to stress here that the predictions generated by the aforementioned models are well in line with those of a substantial part of the literature on the effect of PTAs on their members' external tariff policies. In fact, this is the case even if we restrict attention to papers that do *not* share the focus of our theoretical framework on self-enforcing multilateral cooperation.[8] In particular, various such papers have demonstrated that FTA agreements induce—after their implementation—their member countries to lower their tariffs vis-à-vis non-members (i.e., they produce the so-called "tariff complementarity effect," a term first introduced by Bagwell and Staiger, 1999). For example, Ornelas (2005) develops an oligopolistic-political-economy model, in which governments' preferences are defined as in Grossman and Helpman (1994) and the lobbying process is modeled as a simple bargaining problem between the domestic industry and its government. Richardson (1993), instead, employs a multi-sector Ricardo–Viner model, focusing on a "small" country selecting its tariffs in order to maximize a Stigler–Peltzman political support function augmented by considering the distribution of tariff revenues, whereas Bond et al. (2004) present an endowment model with tariffs chosen so as to maximize national welfare. As far as CU agreements are concerned, a number of papers have shown that CUs might lead—once formed—to a less liberal multilateral trading environment via inducing their member countries to raise their tariffs against the rest of the world. And once again, this result has been derived also in the context of models that do not share the focus of Tabakis (2010) on self-enforcing multilateral cooperation. For instance, Krugman (1991) looks at the optimal non-cooperative behavior of symmetric CUs, while Bond and Syropoulos (1996)

[8] This is important for the purposes of our empirical analysis since one might argue that developing countries, which are well represented in our sample, cooperate little at the multilateral level as suggested by their relatively high MFN bound rates.

extend Krugman's (1991) analysis by employing a more general version of his model in terms of its supply structure and by considering also the formation of asymmetric CUs. Last, in a more recent paper, Ornelas (2007) focuses on CU agreements between small countries that can affect, though, their own import prices (but not other countries' import prices).

3 Empirical Predictions and Methodology

The theoretical framework described in the previous section gives rise to a number of testable predictions regarding the implications of the negotiation and implementation of PTAs for the use of contingent trade instruments. Among those that qualify as such, AD measures are the ones that are being used the most extensively around the world as they are relatively easy to administer, and a case for their introduction is not that difficult to meet the necessary legal requirements. Countervailing duties (CVDs) as well as China-specific and global safeguards (SGs) also fall in this category, but they are not used as extensively because of the more stringent conditions that must be fulfilled for introducing such measures.[9] For example, Bown and Crowley (2016, Table 5) report several statistics related to the shares of various countries' imports covered by different contingent measures over the period 1995–2013. Their statistics demonstrate that AD is the favoured instrument, and when CVDs and SGs are used, they are often applied to the same products also targeted by AD. Moreover, among the countries included in our econometric analysis, it is only for China, the European Union (EU), Indonesia, Turkey, and the United States that other instruments besides AD have had a meaningful impact on trade, but even in these cases, only for some short time periods (see Table 5 and Figure 10 in Bown and Crowley, 2016). Thus, our analysis and discussion both focus on AD, but we also consider the use of alternative contingent trade instruments in some specifications.

Focusing, then, on AD measures, the theoretical models by Tabakis (2010, 2015) generate the following testable predictions:

1. The number of AD measures of members against non-members of an FTA agreement should decrease both during its negotiation and after its implementation.

[9] China-specific SGs were allowed to be used until December 2013 under the terms of China's WTO accession agreement.

2. The number of AD measures of members against non-members of a CU agreement should decrease during its negotiation.

3. The number of AD measures of members against non-members of a CU agreement should decrease (increase) following its implementation for low (high) import volumes from non-member countries.

In order to assess the validity of these predictions, we proceed in two steps. First, we examine whether the negotiation and the implementation of PTAs affect the application of AD measures by PTA members against non-member countries, without distinguishing between FTAs and CUs. This serves as a preliminary stage to find out whether there is any *prima facie* evidence in the data of the effects that should arise as a result of the establishment of PTAs. Notice that a lack of evidence on PTA implementation affecting AD use may be due to the opposite effects that FTA and CU agreements might produce once implemented (as a function of member countries' import volume from non-member countries). On the other hand, the negotiation of PTAs is unambiguously expected to have a negative impact on their (prospective) members' extra-PTA AD activity since during the negotiation of either an FTA or a CU agreement, the negotiating countries should engage in less AD activity against the rest of the world as compared with the pre-negotiations period. In the second step, the three predictions are individually tested by allowing for differential effects between FTA and CU agreements on the employment of AD protection.

In both steps, the dependent variable captures the extent of AD usage by country i against country j in year t. In our benchmark regressions, we use the count of new AD measures imposed, but we also experiment with alternative formulations of the dependent variable. In particular, taking into account that AD measures vary in terms of product scope, we follow Bown and Crowley (2013b), among others, and use the number of distinct tariff lines targeted by new AD actions, utilizing the Harmonized System (HS) of tariff nomenclature (at the 6-digit level of the classification, which is common across countries). However, since the HS was introduced in 1988, we are forced to drop a few years from the sample period of some countries (see Table A2 in the Appendix for details on the sample period by country). Taking instead a broader view of contingent protection, we alternatively use as our dependent variable

the count of new AD, CVD and China-specific SG measures. We do not consider global SG measures because such measures, unlike AD, CVD, and China-specific SG measures, are applied against all trade partners (with the exception, under certain conditions, of developing countries) and not on a bilateral basis, making them an unsuitable contingent trade instrument to be employed in the face of bilateral import-volume shocks.[10] As the dependent variable is always a non-negative integer, we employ a negative binomial estimator.[11] Using $Y_{i,j,t}$ to denote the "generic" dependent variable, the basic specification we estimate in the first step is:

$$\begin{aligned} Y_{i,j,t} = \beta_1 PTAs\ negotiation_{i,k,t} + \beta_2 PTAs\ implemented_{i,k,t} \\ +\beta_3 X_{i,j,t-s} + \beta_4 Z_{i,t-s} + \beta_5 W_{j,t-s} + \phi_t + \mu_i + \nu_j + \varepsilon_{i,j,t}, \end{aligned} \tag{1}$$

where $PTAs\ negotiation_{i,k,t}$ and $PTAs\ implemented_{i,k,t}$ are the regressors of interest. For most of the analysis (including our benchmark specifications), $PTAs\ negotiation_{i,k,t}$ is the count of PTAs that country i is negotiating with any country $k \neq j$ at time t, while $PTAs\ implemented_{i,k,t}$ counts the number of implemented PTAs (i.e., PTAs in force) between countries i and $k \neq j$ in year t (out of those that have entered into force during the sample period). Notice that the important feature of these variables is that they measure the involvement of country i in PTAs not including the trade partner j as the focus of our analysis is on the effect of PTAs on AD use between their members and non-member countries. In terms of other variables, we control for the level of bilateral imports of country i from country j, their growth, and the bilateral real exchange rate (all part of $X_{i,j,t-s}$), as well as for the GDP growth of importing country i ($Z_{i,t-s}$) and exporting country j ($W_{j,t-s}$), with s in the subscript indicating the lag of the given regressor. Year fixed effects (ϕ_t) are always included, while μ_i and ν_j represent separate importer and exporter fixed effects; in addition, all estimations are replicated with μ_i and ν_j being replaced with country-pair (i.e., dyad) fixed effects. Standard errors are always clustered at the country-pair level although we discuss alternative possibilities in the robustness section.

In the second step of the econometric analysis, we distinguish the effects of the negotiation and the implementation of FTAs from the corresponding effects associated with CU forma-

[10] In a robustness check, we also use the share of bilateral imports subject to new AD measures as the dependent variable.

[11] Compared with a Poisson regression model that assumes that the conditional mean and the conditional variance of the dependent variable are the same, a negative binomial regression model allows for overdispersion (i.e., the variance exceeding the mean), which is what we observe in our data.

tion. Thus, the key regressors are four in those estimations: $FTAs\ negotiation_{i,k,t}$, $FTAs\ implemented_{i,k,t}$, $CUs\ negotiation_{i,k,t}$, and $CUs\ implemented_{i,k,t}$. Furthermore, the specification must allow for differential effects between FTA and CU agreements following their implementation as a function of the import volume of member countries from non-members. Therefore, the implementation regressors need to be interacted with $Import\ growth_{i,j,t/t-1}$ to check whether the data confirm that extra-CU AD activity may actually increase as a result of the implementation of a successfully negotiated CU agreement and a surge in CU members' imports from non-member countries.[12]

The possible effects of the negotiation and implementation of PTAs on their members' extra-PTA AD activity are identified through different variation in the data, depending on whether importer and exporter or dyad fixed effects are used. The inclusion of country-pair fixed effects makes for the most demanding specification as any time-invariant country-pair-specific heterogeneity is absorbed by the dyad fixed effects, and any significance of the coefficients of interest stems from variation within the country pairs due to the different PTAs in which the importing countries are involved over time (in terms of negotiation and implementation). While this provides us with a clean method for identifying the effects of interest as any unobservable non-time-varying dyad-specific effects are controlled for, the non-linear nature of the estimator forces us to drop any country pair (i, j) for which it is the case that not a single AD measure has been introduced by the importing country i against the trade partner j during the sample period. Some of these country pairs should be dropped from the estimation because they are such that the imposition of AD measures between the two countries is highly unlikely (e.g., very small exporting country). However, some other country pairs may be excluded when the zero for AD measures is a "true" zero: even though there has been zero AD activity between such a given country pair, AD measures could have certainly been introduced between the two countries in question. Using separate importer and exporter fixed effects constitutes an alternative identification strategy, which does not have

[12] Although there could be, in principle, an endogeneity problem between AD and bilateral imports, it is important to note that the annual share of bilateral imports subject to new AD measures is very small across the main AD users (in particular, its median value in our sample, conditional on bilateral imports being subject to new AD measures, is a mere 0.3%), significantly reducing any concerns regarding endogeneity. Still, we have experimented with lagging both bilateral imports and their growth by one more year, and the results are unchanged.

this disadvantage (namely, the exclusion of the latter observations). In this case, only importing countries that have used AD at some point during the sample period (against any trade partner) are included, but this is not a limitation since we do want to restrict the analysis to active and intense users of AD.

When including dyad fixed effects, these effects are estimated instead of relying on a conditional fixed-effects estimator. In the latter case, the fixed effects are "conditioned out" of the likelihood function (i.e., a conditional likelihood function is used) and are not estimated. Thus, such an estimator is not equivalent to what is usually thought of as a fixed-effects estimator (as the individual effects are never actually estimated). In fact, in the conditional fixed-effects negative binomial model, the coefficients of time-invariant variables can be estimated. On the other hand, the inclusion and estimation of the dyad fixed effects may give rise to inconsistent estimates due to the incidental parameters problem in short panels. However, Allison and Waterman (2002) demonstrate that the unconditional fixed-effects negative binomial estimator does not suffer from any incidental parameters bias.[13]

Before moving to discussing the data and the results, a few remarks are in order. First of all, the key regressors discussed so far (namely, the ones related to negotiation and implementation of PTAs by importer i) only take into consideration PTAs affecting at least a minimum share of country i's imports. More specifically, for each PTA of which country i is a member, we look at country i's share of intra-PTA imports in its total imports in the year before the entry into force of the agreement, or if not yet in force by the end of our sample period, in the year before the launch of its negotiation. As a matter of fact, we can reasonably expect that the mechanisms discussed in Section 2 are at work only for FTAs and CUs affecting a significant amount of member countries' trade; for the other PTAs, their trade-diversion and market-power effects—underlying the strategic effects of their formation—should be very small (or negligible). Theory is silent on what "significant" actually means in practice. In our main regressions, we assume this import-share threshold to be 10%, but we discuss the sensitivity of our results to the chosen threshold in the robustness section.

A different way to capture the extent of country's i involvement in PTAs is to measure the shares of its imports affected by the negotiation and the implementation of PTAs. In

[13] In addition, for some country pairs, our sample covers a period of 36 years (see Table A2 in the Appendix).

this case, we do not have to choose a threshold, but different complications arise. On a methodological front, we may be concerned that these shares are endogenous to the use of AD. On a practical front, it is important to point out that we treat the EU as a "country" as its member states have delegated trade policy authority to the EU. However, the composition of the EU has been changing over time due to its various enlargements, which poses significant problems in its case for such trade-share calculations. To address both issues and verify the robustness of our results to the use of continuous "threshold-free" PTA regressors, we calculate the aforementioned shares based on the trade flows in 1980 (i.e., the first year of our sample period), holding constant the membership of the EU also as of 1980.[14] This solution, though, comes with the caveat that the world has experienced a dramatic change in trade patterns since then, which explains why we do not use this version of the PTA regressors in the benchmark regressions.

In terms of the sample, we do not include country pairs that are partners to the same PTA in force or are jointly involved in the negotiation of one. The reason is that our focus is on studying whether PTAs have an effect on the use of AD measures by their members against non-member countries while being negotiated and after entering into force. Our empirical analysis thereby focuses on a comparison of AD patterns between members of PTAs and non-members before versus after the negotiation and the implementation of the PTAs in question, not on a comparison of AD patterns within PTAs vis-à-vis AD patterns between PTA members and non-member countries (although we revisit this choice in the section on robustness checks).[15]

4 Data

In order to implement the econometric strategy discussed in the previous section, three sets of data are needed. Detailed information on the history of formation of PTAs is essential for our analysis, with this dataset having proved to be the most difficult to build. Data on the

[14] We still restrict our attention to PTAs affecting at least 1% of country i's imports.

[15] We exclude any pair of countries that are members of the same PTA in force as recorded by de Sousa (2012). In the case of a country pair (i, j) negotiating a PTA, we exclude it if the share of imports of country i affected by the trade agreement is at least 1%.

use of AD and other contingent instruments are required to construct the dependent variable in its various forms, while the final dataset comprises data on trade and macro variables. In what follows, we discuss each of these datasets in turn.

Regarding PTAs, our full sample consists of all agreements notified or announced early to the GATT/WTO, satisfying all of the following three conditions: (i) they entered into force during 1980–2015 (i.e., during our sample period) and were still active by the end of 2015, or they were not yet in force by the end of 2015, but an early announcement of them has been made to the WTO; (ii) they involve at least one of the 15 most intense users of AD (to be specified below); and (iii) for at least one of their members belonging to the aforementioned set of 15 countries, the share of intra-PTA imports in its total imports was at least 1% in the year before their entry into force, or for PTAs not yet in force by the end of 2015, in the year before the launch of their negotiation. For these PTAs, we undertook extensive data collection since no single source (e.g., Dür et al., 2014) provides complete details on the history of formation of the existing PTAs. In particular, for each PTA in our sample, we gathered detailed information with respect to its entire history—namely, we gathered the dates of (i) the initiation of the PTA formation process (e.g., the launch of a joint feasibility study); (ii) the launch of negotiations; (iii) the start of the first round of formal negotiations; (iv) the formal conclusion of negotiations; (v) the signature of the agreement; (vi) the ratification of the agreement; and (vii) the entry into force of the agreement. However, in line with the timing of the strategic effects produced by PTA formation within the context of our theoretical framework, the empirical analysis utilizes two of these dates for each PTA: the date of the launch of negotiations and the date of its entry into force.[16] The information comes from a wide range of online sources, including (but not limited to) the WTO, the European Commission, the European Parliament, the Office of the United States Trade Representative, the Foreign Trade Information System (SICE) of the Organization of American States, the Asia Regional Integration Center of the Asian Development Bank, partner countries' official sources (e.g., the Ministry of Commerce of China), or national legislative bodies (for ratification dates). As

[16] In some cases (e.g., the EU–South Africa Trade, Development and Cooperation Agreement), an agreement is provisionally applied before it fully enters into force. For these agreements, we use in our empirical analysis the date of provisional application rather than the date of entry into force as the provisional application of a PTA already has important ramifications for the trading relationship between its members and non-member countries (e.g., in terms of trade diversion).

a last resort, we also used historical data from quality newspapers.

Using 10% as the import-share threshold in condition (iii) above in order to choose which PTAs to include in our main analysis, we end up with 24 PTAs for the construction of our key regressors related to negotiation and implementation of PTAs by importer i (see Table A1 in the Appendix for the full list). Out of these 24 PTAs, five are classified as still under negotiation based on their status at the end of 2015, while only four are CUs.[17] It is important to note here that one given PTA may be counted for more than one of the importing countries included in the analysis depending on each member's share of intra-PTA imports in its total imports. For example, NAFTA is counted for all three member countries—Canada, Mexico, and the United States—but the CU between the EU and Turkey is counted only for Turkey due to EU imports from Turkey in 1995 (i.e., the year before the entry into force of the agreement) representing less than 10% of the EU's total imports. Moreover, it should be stressed here that there are few CUs in the sample which, if anything, may make it harder to find support for our theoretical predictions regarding CUs.

The data on AD usage (since 1980) come mainly from the Global Antidumping Database (Bown, 2016a) and are complemented with information from Moore and Zanardi (2009) for some countries and years.[18] In particular, these sources allow us to construct the dependent variable as the count of AD measures introduced by an importer i against an exporter j in year t. The database in question also includes details about the HS lines targeted by each AD measure, which we use in constructing two of our alternative dependent variables: the number of HS lines targeted by new AD measures and the share of bilateral imports subject to new AD measures. Since we would expect the PTA effects on the use of AD to occur only for those countries that do make systematic use of this form of contingent protection, we limit the sample of importing countries to those using intensely this policy instrument. Table 1 provides summary statistics on the worldwide use of AD (in terms of both initiations and measures) over our sample period, which runs from 1980 until 2015, with a later starting year for importing countries that have implemented an AD law more recently (see Table A2

[17] We should note that we treat MERCOSUR as a CU under negotiation during 1988–1994, as an implemented FTA during 1991–1994, and as an implemented CU from 1995 onwards.

[18] For the sample used in the econometric analysis, only the data for Canada before 1985, the EU before 1987, and New Zealand before 1995 are taken from Moore and Zanardi (2009).

in the Appendix for details on included years by country). In order to select which countries to include in our sample of importers, we consider the cumulative number and annual average of AD investigations and applied measures (e.g., AD duties, price undertakings) by country.[19] The summary statistics reported in Table 1 corroborate previous findings in the literature in terms of the countries that are the most intense users of this instrument. Based on the table, we include in our sample of importing countries the five traditional users of AD (consisting of Australia, Canada, the EU, New Zealand, and the United States) and the ten most active new users: Argentina, Brazil, China, India, Indonesia, Mexico, Peru, South Africa, South Korea, and Turkey. We choose to include New Zealand among them because, although its numbers of initiations and measures per year over our entire sample period are not very large, it was a heavy AD user in the 1980s (a period which is included in our analysis); and in a robustness check, we drop it.[20] Furthermore, the data on CVDs and China-specific SG measures come from the Global Countervailing Duties Database (Bown, 2016b) and the China-Specific Safeguards Database (Bown, 2016c), respectively.

As for the import data (at the aggregate bilateral level), they are taken from IMF's Direction of Trade Statistics, and they serve two purposes. First, we need to control for the size of imports from a given trade partner and their growth as they are both known determinants of AD measures against the country in question. Not less importantly, one of the empirical predictions emerging from Tabakis (2010) is that the effect of CU agreements, once implemented, on the AD usage of their members against non-member countries depends on the members' import volume from the latter. Hence, interacting import growth (between t and $t-1$) with the PTA implementation variables is key in distinguishing the impact of FTAs from CUs on their members' extra-PTA AD activity. Moreover, as one robustness check requires the use of bilateral trade values at the 6-digit HS level, we also extract data from UN Comtrade.

Macro controls comprising the (log of the) bilateral real exchange rate (with a 1-year lag) and importer and exporter GDP growth rates (between t and $t-3$) are also included as

[19] Initiations and measures per year are based on the number of years for which a country has had an AD law in force during the sample period 1980–2015.

[20] We do not include Taiwan in our sample of importers, even though it has initiated quite a few investigations, because of its very low success rate for the introduction of AD measures (more specifically, 23.4% versus 56.1% for the entire set of AD users and 57.1% for the chosen 15 importers), which we use as our dependent variable in the benchmark regressions (and in most of our analysis).

they have been shown to affect the introduction of AD measures (e.g., see the seminal work by Knetter and Prusa, 2003). In fact, the lag structure we employ for the macro controls is identical to the one of Knetter and Prusa (2003). Our GDP data are taken from the World Development Indicators (WDI), while the data on the bilateral real exchange rate come from the Economic Research Service of the United States Department of Agriculture. Finally, in one robustness check, we need data for each of our importers on the ideological orientation of its government and its capital–labor ratio. The former come from the Database of Political Institutions (Cruz et al., 2018), with the ideology variable taking a value of 1, 2, or 3 depending on whether the government is right-wing, centrist, or left-wing, respectively.[21] The data on capital are taken from the Penn World Table, while the data on labor (defined as the population aged 15 to 64) come from WDI.

Merging these sets of data, the sample consists of 15 importing countries and all of their trade partners as exporters over the period 1980–2015. Nevertheless, starting from the consideration of all possible trade partners of the 15 importing countries specified above, import and macro data are missing in many cases, and therefore, the inclusion of the associated regressors forces us to drop many observations. For the observations included in the benchmark regressions, the summary statistics of our variables are reported in the top panel of Table 2, while the bottom panel reports statistics for the alternative dependent variables and PTA regressors employed in our analysis. It is clear that AD measures are not very common even though they are very important policywise (and the average count of new AD measures imposed doubles in the sample used in the regressions with dyad fixed effects, consisting of country pairs with at least one introduced AD measure). The same holds true when considering the number of HS lines subject to AD or the total count of AD, CVD, and China-specific SG measures. In terms of the regressors of interest, the maximum number of either simultaneous PTA negotiations or simultaneous PTA implementations is 5, which is reached in both cases by Indonesia because it is part of the agreements involving ASEAN (see Table A1). Moreover, the summary statistics of our FTA and CU regressors clearly illustrate that there are few CUs in our sample

[21] Following Dutt and Mitra (2005), we use the ideological orientation of the chief executive for presidential systems, that of the largest governing party for parliamentary systems, and their average for political systems with an assembly-elected president. We should further note that data are missing for Indonesia (for the entirety of our sample period) and Turkey (for 2003–2015), and that we assign a value of 2 to the EU throughout.

(especially under negotiation in any given year), which could make it difficult to find support in the data for the theoretical results regarding CUs discussed in Section 2.

5 Empirical Results

The results of the first step of our econometric analysis are presented in Table 3. In this case, we do not distinguish between FTAs and CUs in their effects on the use of AD by their members against the rest of the world. Still, it should be the case that higher values of $PTAs\ negotiation_{i,k,t}$ lead to fewer extra-PTA AD measures (as the effects of FTA and CU agreements during their negotiation should be qualitatively the same according to our theoretical framework). In addition, the estimated coefficient of $PTAs\ implemented_{i,k,t}$ should also be negative, except if the effect from members of CUs facing high import growth from non-member countries dominates.

Table 3 contains eight specifications that differ in terms of the dependent variable, the PTA regressors, and/or the set of included fixed effects. The first two columns present our benchmark results, with the dependent variable being the count of new AD measures imposed. In column (1), we include separate importer and exporter fixed effects, which we replace in column (2) with country-pair fixed effects, a pattern that we henceforth follow in all of our estimations. In columns (3)–(8), we explore the robustness of our benchmark results to alternative formulations of the dependent variable and of the PTA regressors. More specifically, the dependent variable is the total number of 6-digit HS tariff lines subject to new AD measures in columns (3)–(4), while it is the count of newly introduced AD, CVD, and China-specific SG measures in columns (5)–(6); on the other hand, in columns (7)–(8), we retain our benchmark dependent variable but use as main regressors the shares of imports affected by the negotiation and the implementation of PTAs. Before delving into the specifics of these estimations, it is obvious that the results are very robust: across specifications, we find that the negotiation and the implementation of PTAs between an importing country i and any country $k \neq j$ in year t both reduce the AD activity of country i against trade partner j in the same year. The corresponding coefficients are always statically significant (at least at the 5% level), with the estimated coefficient of $PTAs\ implemented_{i,k,t}$ being larger (in absolute value) than the one

of $PTAs\ negotiation_{i,k,t}$ in all regressions. Thus, it is the case that the data provide support to the theoretical predictions discussed in Section 2.[22] In graphical terms, the negative coefficient of $PTAs\ negotiation_{i,k,t}$ represents the downward shift in the $\widehat{\tau}^c$ curve between phases 1 and 2 in both Figures 1 and 2 since as either FTA or CU negotiations are launched around the globe, countries' expected value of future multilateral trade cooperation increases, while their static incentive to defect from the cooperative path of play remains unaffected. As for the coefficient of $PTAs\ implemented_{i,k,t}$, Figures 1 and 2 highlight an important difference between FTA and CU agreements following their implementation that we will address in Table 4.

Looking in detail at Table 3, notice that the inclusion of dyad fixed effects leads to a significant loss of observations (more precisely, any country pair (i, j) for which it is the case that the dependent variable equals to zero throughout the sample period is dropped). Still, there is no change in the qualitative results when employing this much more demanding identification strategy: given a definition of the dependent variable and of the PTA regressors, there are no statistically significant differences in the estimates of the coefficients of the main regressors between the two specifications with the different sets of fixed effects (except in the case of $PTAs\ implemented_{i,k,t}$ in columns (3) and (4)). The number of observations is the smallest when the dependent variable is the number of targeted HS lines because, as discussed above, the HS was introduced only in 1988, forcing us to drop a few years from the sample period of some of our importers. Instead, when the dependent variable is the count of newly introduced AD, CVD, and China-specific SG measures, there is an increase in the number of observations relative to the benchmark regressions in columns (1)–(2). The reason is that some exporters and importer–exporter pairs are now retained (in columns (5) and (6), respectively) because, even though the given exporters never faced any AD measure over our sample period from, respectively, any of our importers or the specific importer in the pair, the same does not hold when taking into consideration other instruments of contingent protection. More importantly, the estimated coefficients of $PTAs\ negotiation_{i,k,t}$ and $PTAs\ implemented_{i,k,t}$ would not be statistically different if the trade and macro controls were omitted, except in

[22] Obviously, it is possible to "merge" two of the approaches discussed above and use the count of HS lines subject to new AD, CVD, and China-specific SG measures as the dependent variable. The qualitative results when using this dependent variable are unchanged.

the case of specifications (7) and (8). Such "minimalist" regressions (omitted to save on space but available upon request) would include many more observations (e.g., about 9,500 and 2,500 more observations in columns (1) and (2), respectively), which are otherwise dropped due to missing trade and macro data. It is without doubt reassuring that reducing the sample size has minimal effects on the estimated coefficients, especially because the second step of our empirical strategy cannot be executed without the inclusion of import growth in our specifications.

Looking at the point estimates of the coefficients of the PTA regressors, they appear very similar to one another across the first six columns of Table 3. This is not surprising considering that the median number of targeted 6-digit HS tariff lines per AD measure is 1 (reaching a value of 2 only at the 75^{th} percentile of the distribution), and that there are few CVDs and China-specific SG measures overall (see also the summary statistics in Table 2). On the other hand, their point estimates in columns (7)–(8) are quite larger (in absolute value) than in columns (1)–(6) because the PTA regressors in the last two columns are trade-share variables rather than count variables. An in-depth discussion of the economic significance of our results is deferred to Section 5.1, but we can already anticipate that the economic significance of our estimates is comparable across specifications. As far as the control variables are concerned, their coefficients are in line with what we expect from previous studies: the estimated coefficients of import volume and import growth are always positive (although import growth is mostly statistically insignificant), as is the case for the coefficient of the bilateral real exchange rate (while the coefficients on importer and exporter GDP growth rates are never statistically significant).[23]

The dual purpose of step 1 of our econometric analysis was to establish *prima facie* evidence of the effects predicted by our theoretical framework and to dispel concerns about sample selection bias due to the unavailability of the trade and macro controls. The latter is crucial as we advance to the second step of our analysis, with the inclusion of import growth in our specifications being now essential in order to test the empirical predictions in all their detail. We have to keep in mind, however, that some concerns about sample selection bias remain

[23] Note that a higher value of the bilateral real exchange rate variable corresponds to an appreciation of the real exchange rate of the importing country.

when it comes to the specifications in which the PTA regressors are trade-share variables (rather than count variables).

The results of the second step of our econometric analysis are reported in Table 4, the structure of which mirrors that of Table 3. Overall, the negotiation of PTAs is found to reduce (prospective) members' extra-PTA AD activity. In particular, the coefficient on $CUs\ negotiation_{i,k,t}$ is consistently negative and significant (except in columns (7)–(8); but as we discussed above, in the case of these specifications, there exist some concerns about sample selection bias stemming from the loss of observations due to missing trade and macro data). On the other hand, in terms of statistical significance, the effect of FTA negotiations on AD use is relatively weaker (and in columns (3)–(4), the estimated coefficient on $FTAs\ negotiation_{i,k,t}$ is of the "wrong" sign, albeit statistically insignificant). As far as PTAs in force are concerned, FTAs have a negative impact on the employment of AD protection independently of the growth of extra-FTA imports. The coefficient on $CUs\ implemented_{i,k,t}$ is also negative in all but one of the estimated specifications, signifying a negative impact of implemented CU agreements on members' extra-CU AD activity. Nonetheless, the coefficient on the interaction term with import growth is always positive and significant. This means that the beneficial effect of CU establishment on multilateral trade cooperation may be overturned when CU members face sufficiently large import surges from non-member countries, and the quantification exercise in the next section investigates whether this possibility could indeed materialize in our sample. Observe that this last result is consistent with the empirical predictions derived from Tabakis (2010) and especially with the slope of the $\widehat{\tau}_3^c$ curve in Figure 1. As for the other regressors, their coefficients' significance is in line with the picture emerging from Table 3.

Notice that these results seem to be at odds with the findings of Prusa and Teh (2010) who showed that PTAs tend to increase the incidence of AD filings by PTA members against non-member countries. However, Prusa and Teh (2010) engage in a very different type of analysis as attested by their very different research design and econometric methodology. In particular, they rely on a difference-in-difference setup, they look at a broad range of PTAs and AD users, while they focus on a given window of years before and after the implementation of each PTA to identify the effects of interest. Interestingly, the aforementioned effect of PTAs with respect to non-members does not hold when the authors include fixed effects instead of

random effects in their benchmark specifications (with the full set of controls).[24] In addition, in a major robustness check, the result in question is actually reversed (i.e., PTAs lead to fewer AD cases by PTA members against not-PTA trade partners) in the case of PTAs that prohibit intra-PTA AD activity. In fact, it is not necessarily the case that our results are inconsistent with theirs as the research design of Prusa and Teh (2010) is best suited for uncovering the effects of PTAs on intra-PTA AD activity.

In conclusion, the estimates in Tables 3 and 4 provide clear support to the theoretical predictions discussed in Section 2, suggesting that PTAs mostly constitute a building block towards further multilateral trade liberalization. In particular, the negotiation and the implementation of PTAs both have an effect on the extent of AD use by PTA members against non-member countries. The more interesting part is that in both cases, the mechanisms at work (underlain by the market-power and trade-diversion effects of PTAs) induce lower extra-PTA AD activity, except when members of CUs in force face substantial import growth from non-member countries. And this differential effect of FTAs and CUs on the multilateral trading system is very much in line with the evidence provided by Estevadeordal et al. (2008).

5.1 Quantification of Effects

Given the non-linear nature of the estimator, the estimated coefficients do not allow for a quantifiable interpretation of the impact of our key regressors on AD patterns. To facilitate such an analysis, we report in Table 5 the predicted counts for our dependent variables based on the specifications in Table 4 that enable us to test all three predictions of our theoretical framework. We focus on the specifications including dyad fixed effects, which are the most demanding when it comes to identifying the ramifications of PTAs for AD activity. The top panel of Table 5 reports the predicted counts when an importing country is not involved in either the negotiation or the implementation of any FTA versus when an importing country is involved in the negotiation or the implementation of an FTA, with the effect of an implemented FTA being evaluated at different levels of import growth. In the middle panel, we repeat the same analysis for CUs. The table also includes the percentage change for each scenario as compared with the benchmark scenario of no PTA under negotiation or in force. And these

[24] Our results are robust to the use of country-pair random effects.

percentages provide the easiest way to assess the impact of PTAs on their members' extra-PTA AD activity.

Let us begin with our benchmark regression in column (1), in which the dependent variable is the count of new AD measures. Clearly, AD is a relatively rare phenomenon (as already seen in the summary statistics in Table 2) even when restricting the sample to country pairs with at least one AD measure during the sample period (i.e., when including dyad fixed effects): the estimates predict fewer than one AD measure when there is no FTA or CU either under negotiation or in force (more precisely, 0.426 or 0.362, respectively). The relevant question, though, is what happens when an importing country is involved in the negotiation or the implementation of a PTA. The predicted count of AD measures then drops significantly: one FTA under negotiation reduces the count of new AD measures by 13.4% (significant at the 5% level), while the negotiation of a CU reduces their count by 44.9% (significant at the 1% level), with the bigger impact of CUs reflecting their larger estimated coefficient in column (2) of Table 4. When it comes to the effect of implemented PTAs, it becomes critical to consider the growth of extra-PTA imports, and in what follows, we focus on the cases of low import growth (i.e., 25^{th} percentile of the distribution) and high import growth (i.e., 75^{th} percentile of the distribution). In line with the theoretical predictions, the tests at the bottom of the table show that the effect of implemented FTAs is independent of the growth of members' extra-FTA imports as the predicted counts for one implemented FTA but at different levels of import growth are not statistically different from each other (in particular, 0.254 and 0.257 are not statistically different from each other). More specifically, one implemented FTA reduces members' extra-FTA AD measures by around 40% as compared with the benchmark scenario of no FTA under negotiation or in force, no matter the level of growth of extra-FTA imports. By contrast, import growth does matter when it comes to quantifying the effects of implemented CU agreements. One implemented CU agreement along with low growth of imports from non-members leads to fewer AD measures against them relative to the benchmark scenario (as 0.362 is statistically different from 0.244 at the 1% level). However, there is a much weaker effect when CU members' import growth from non-members is high (more precisely, 0.362 is statistically different from 0.273 only at the 10% level). It is also the case that one implemented CU leads to statistically different effects depending on import

growth (as 0.244 and 0.273 are statistically different from each other). Thus, in the case of high import growth, the building-block effect of CUs is significantly weakened (in terms of statistical significance), but still, there is no evidence of CUs being stumbling blocks towards further multilateral trade liberalization.[25]

Using the count of HS lines subject to new AD measures as the dependent variable (column (2) of Table 5) leads to similar conclusions although the statistical significance of some of the results is weaker (reflecting the differences in the significance level of the estimated coefficients in Table 4). In particular, the negotiation of an FTA does not seem to statistically reduce the number of HS lines targeted by new AD measures, but the implementation of an FTA does statistically reduce the count of targeted HS lines (independently of import growth) by about 35% on average. As for CUs, their negotiation reduces their members' extra-CU AD activity, while the implementation of a CU exhibits much weaker effects relative to column (1): insignificant effects under both scenarios of import growth but some indication of a stumbling-block effect in the high-growth case (more precisely, a 1.6% increase in targeted HS lines, albeit insignificant). In terms of the magnitude of the predicted counts, the picture emerging from column (2) is consistent with the one arising from column (1), which is not surprising if we take into account the fact that the median number of targeted HS lines per AD measure is 1 and the average number is 2.7. Using the count of AD, CVD, and China-specific SG measures as the dependent variable (column (3) of Table 5) delivers predicted outcomes that are very similar to the ones in column (1), which is again to be expected given that there are overall very few CVDs and China-specific SG measures. Finally, column (4) is based on the specification in which the key regressors are continuous trade-share variables. In this case, the predicted counts are calculated by assuming that the shares of imports affected by the negotiation or the implementation of PTAs are zero when, respectively, $PTAs\ negotiation = 0$ or $PTAs\ implemented = 0$ (for $PTA = \{FTA, CU\}$) and are otherwise equal to the average value of the relevant regressor (conditional on FTAs or CUs being under negotiation or in force; e.g., for $CUs\ negotiation = 1$, the share of imports affected by the negotiation of CUs is assumed to be equal to the average value of the regressor $CUs\ negotiation$ for those

[25] Similar counts can be computed for more than one PTA under negotiation or in force, or for negotiations and implementations occurring simultaneously. Such predicted counts would not add much to the interpretation of the results.

observations for which it is strictly positive). By and large, the results are in line with the ones in the first column in terms of both magnitude and statistical significance although we find insignificant effects for implemented CUs under both import-growth scenarios and some suggestive evidence of a stumbling-block effect in the case of high import growth.

In conclusion, it is not only the estimated coefficients that provide evidence in support of the theoretical predictions discussed in Section 2. The quantification exercise demonstrates that the building-block effect of PTAs is sizable but can disappear in the case of implemented CU agreements and large (enough) surges of extra-CU imports. However, we never find significant evidence of CUs producing a stumbling-block effect with our large sample of countries (whereas Bown and Tovar, 2016, do find evidence of a stumbling-block effect for MERCOSUR after it started to operate as a CU).[26]

5.2 Robustness Checks

Tables 3 and 4 already include various robustness checks, demonstrating that our benchmark results are robust to alternative modeling choices. More specifically, the tables in question contain various specifications that differ in terms of the dependent variable, the PTA regressors (namely, trade-share variables versus count variables), and/or the set of included fixed effects (namely, separate importer and exporter fixed effects versus dyad fixed effects). However, there are other (conceptual and methodological) aspects to consider in order to confirm the overall robustness of our conclusions.[27]

Table 6 reports the results of five different robustness exercises, taking our benchmark regressions in columns (1)–(2) of Table 4 as our reference point. In the first two columns, we consider the possibility that the political ideology of individual governments (and changes thereof) may be driving their more liberal (or more protectionist) trade policies over time in terms of both PTAs and contingent measures. Clearly, government ideology cannot be driving the differential impact of FTAs and CUs on their members' extra-PTA AD activity as a function of the growth of extra-PTA imports, but some concerns still remain. In order

[26] Even a scenario with import growth at the 90^{th} percentile of the distribution would not lead to statistically significant positive percentage changes in members' extra-CU AD activity as a result of implementing their CU agreement.

[27] Robustness checks that are not reported to save on space are available upon request.

to explicitly control for this possibility, we follow Dutt and Mitra (2005) and include in our specifications a measure of the ideological orientation of country i's government, country i's capital–labor ratio (in logs), and their interaction term. The theoretical expectation is that left-wing governments (for which the ideology variable takes a value of 3) should implement protectionist (liberal) trade policies in capital-abundant (labor-abundant) countries, which is what we find in columns (1) and (2) of Table 6.[28] At the same time, our qualitative results are unchanged (although the coefficient on $FTAs\ negotiation_{i,k,t}$ is not significant anymore in the regression with dyad fixed effects, but the effect of FTA negotiations is not particularly robust already in Table 4). If anything, we find some evidence of a further dampening effect of implemented FTAs on their members' extra-FTA AD activity in the case of high growth of extra-FTA imports, which is consistent with the $\widehat{\tau}_3^c$ curve in Figure 2 being somewhat flatter than $\widehat{\tau}_1^c$.

A related concern is that countries have become overall more open to trade over time, translating into both an increase in the negotiation and implementation of PTAs and a reduction in the use of AD. To control for such a possibility, we replace our importer or dyad fixed effects with the interaction of such fixed effects and a trend (i.e., we allow for importer or dyad-specific trend fixed effects). Once again, our qualitative results are robust to the inclusion of these different fixed effects.

In columns (3) and (4), we re-estimate our benchmark specifications without excluding the country pairs that are partners to the same PTA in force or are jointly involved in the negotiation of one. At the end of Section 3, we argued that these observations should be excluded since the focus of the paper lies on examining the effect of PTAs on their members' extra-PTA AD activity in order to ascertain whether PTAs constitute a building block or a stumbling block towards further multilateral trade liberalization. In addition, the theoretical models by Tabakis (2010, 2015) only give rise to empirical predictions regarding the pattern of AD activity between PTA members and non-member countries. Still, we can include the observations so far discarded, remaining agnostic on how the negotiation and the implementation of PTAs affect their members' intra-PTA AD activity. The results in Table 6 with these extra

[28] In comparison with Dutt and Mitra (2005), we do not find a significant effect for the capital–labor ratio. This is likely due to our inclusion of importer or dyad fixed effects, which Dutt and Mitra (2005) do not include in their specifications, together with the limited time variation of this regressor.

observations and dummy variables that control for country pairs that are members of the same PTA ($PTA\ dummy_{i,j,t}$) or are jointly negotiating a PTA ($Negotiation\ dummy_{i,j,t}$) show that the conclusions we reached earlier are overall still valid (although the estimated coefficients on $FTAs\ negotiation_{i,k,t}$ and $CUs\ implemented_{i,k,t}$ are no longer significant). Moreover, our results are in line with the findings of Prusa and Teh (2010), Ahn and Shin (2011), and Silberberger and Stender (2018) that PTAs have a dampening effect on the AD activity between their member countries (although the effect is statistically significant only when dyad fixed effects are included). Instead, the estimated coefficient on $Negotiation\ dummy_{i,j,t}$ is never significant.

A yet different way to define the dependent variable is to use the share of bilateral imports subject to new AD measures. Conceptually, such a variable better captures the extent of AD protection. However, such an exercise has some serious limitations: i) having to rely on HS tariff lines to calculate the shares requires starting the sample period only in 1988; and ii) the dampening effect of AD investigations on targeted imports implies that we should use lagged values, further reducing our sample size. Notwithstanding these caveats, columns (5) and (6) of Table 6 show the results when using such import shares (lagged by two years[29]) as the dependent variable. As the dependent variable is now an import-share measure, we employ a fractional probit estimator. Again, the results are robust to this alternative formulation of the dependent variable (except for the significance of the coefficient on $FTAs\ negotiation_{i,k,t}$). More importantly, this robustness check provides further evidence that our results are not sensitive to the formulation of the dependent variable used in our estimations.

Except for the specifications in which the PTA regressors are trade-share variables, all the results are based on PTAs that affect at least 10% of the import volume of the importing country under consideration. The choice of a threshold of 10% is based on the interest to consider PTAs that can be expected to have meaningful trade effects that would affect their members' gains from multilateral cooperation and from defection from the cooperative path of play. Still, the 10% threshold is simply assumed, and we need to verify whether the results are sensitive to our threshold choice. Thus, we re-estimate our specifications using a threshold

[29] A typical investigation takes, on average, one year to be completed. Thus, a two-year lag seems the shortest lag that would reduce measurement error in the dependent variable. Ignoring this issue and using contemporaneous values would not affect the qualitative nature of our results.

of 5%. In this case, we would expect the results to become weaker in terms of economic significance and probably less statistically significant as "smaller" PTAs are now included.[30] Columns (7) and (8) of Table 6 present the results of such an exercise. Overall, they are very much in line with our benchmark results although our main regressors have in most cases smaller estimated coefficients (in absolute value) or somewhat lower levels of significance (while there is no qualitative change in the coefficients of the control variables). The only notable difference is that the coefficient on $FTAs\ negotiation_{i,k,t}$ is, again, not significant.[31]

The last robustness check reported in Table 6 deals with the functional form of our PTA regressors. In particular, we use the log of one plus these count variables. This alternative formulation imposes a non-linear effect of the negotiation and implementation of PTAs on their members' extra-PTA AD activity. Once again, the qualitative results are robust to this alternative formulation of the PTA regressors. Moreover, we uncover a non-linear effect of PTAs on their members' extra-PTA AD activity, suggesting that country i's involvement in PTAs exhibits diminishing returns in terms of its building-block effect.

We can also experiment with changing the sample of importing countries included in the analysis. We start by dropping New Zealand as it was a heavy user of AD in the 1980s but has ever since dramatically decreased its use of AD measures. Excluding New Zealand from our sample of importers does not affect any of our qualitative conclusions. Considering the predominant role that India and China have been playing recently when it comes to AD, it is reassuring that our results are qualitatively unchanged as well when we drop them from the sample of importing countries. In a final set of robustness checks, we have also tried clustering standard errors at the importer–year level in consideration of the fact that the number of PTAs under negotiation and in force varies only by importer and year. Even though the standard errors increase, the statistical significance of the coefficients of our key regressors is almost unchanged except for the one on $FTAs\ negotiation_{i,k,t}$ that loses its significance.[32]

[30] With a 5% threshold, 8 more PTAs, of which one is a CU, are used to construct our main regressors (see Table A1 in the Appendix for details).

[31] If we were to reduce the threshold even further to 1%, the estimated coefficients of the key regressors would also be smaller (in absolute value), but the main qualitative results would survive. The only major difference in comparison with Table 4 would be that the coefficients for the negotiation of FTAs and for implemented CUs would be insignificant.

[32] Clustering the standard errors at the importer level would instead lead to few clusters (15 in total), violating the theoretical assumption that the number of clusters goes to infinity (usually interpreted as a

6 Conclusions

This paper has empirically explored the implications of PTAs for their member countries' extra-PTA AD actions (i.e., the AD measures of members against non-member countries). In so doing, it contributes to the long literature examining whether PTAs are building blocks or stumbling blocks on the road to further multilateral trade liberalization. To guide the econometric analysis, we have relied on the theoretical work by Tabakis (2010, 2015). Three main testable predictions regarding PTAs and AD measures emerge from these papers: (i) the number of AD measures of members against non-members of an FTA agreement should decrease both during its negotiation and after its implementation; (ii) the number of AD measures of members against non-members of a CU agreement should decrease during its negotiation; and (iii) the number of AD measures of members against non-members of a CU agreement should increase following its implementation for "high" import volumes from non-member countries, whereas the reverse should be true for "low" volumes of imports.

To empirically test these predictions, we have first constructed a dataset containing extensive information on the history of formation of a large number of PTAs. This novel dataset has allowed us to investigate the impact of PTAs on the use of AD protection both during their negotiation and after their implementation. Using AD data over the period 1980–2015 and different econometric strategies, we have provided clear evidence in support of the aforementioned predictions. PTAs have, in general, a dampening effect on their member countries' AD activity against the rest of the world (i.e., they produce a building-block effect), except when members of an implemented CU agreement face large import surges from non-member countries. In such a case, the building-block effect may disappear, albeit without the (clear) emergence instead of a stumbling-block effect. These results provide a new piece of evidence on the (mostly) positive effects of PTAs on multilateral trade cooperation, at least as far as AD protection is concerned, and the differential effects we have uncovered between FTA and CU agreements on the multilateral trading system are very much in line with the results of Estevadeordal et al. (2008). Finally, the findings of our paper are particularly important in light of the fact that non-tariff barriers have nowadays gained prominence relative to MFN

minimum of 50 in state–year panels; see Cameron and Miller, 2015).

tariffs, which have dramatically decreased in recent decades because of WTO commitments. And among non-tariff barriers, AD is the most flexible and widely employed trade policy instrument, making it the focus of our analysis—but still, our results are robust to considering also the use of alternative contingent trade instruments.[33]

In conclusion, this paper offers yet further evidence that strategic interactions—either across countries or between a given country's policies—play a pivotal role in trade policy formulation (see, e.g., Bown and Crowley, 2007; Tabakis and Zanardi, 2017). In particular, we have demonstrated that a country's decision to engage in regionalism has important ramifications for its AD activity vis-à-vis the rest of the world. What is more significant, our analysis highlights the importance of taking into consideration other policy instruments besides MFN tariffs in order to get a more comprehensive picture regarding whether PTAs are building blocks or stumbling blocks towards multilateral trade cooperation. Last, our findings raise concerns about certain recent developments on the regionalism scene, such as Brexit or the withdrawal of the United States from the Trans-Pacific Partnership Agreement. Of course, it might be inappropriate to extrapolate our results to the case in which a country withdraws from either PTA negotiations or an implemented PTA by simply "reversing" the signs of the reported effects. Nevertheless, by showing the pro-cooperation effects of PTAs at the multilateral level, our analysis does sound the alarm that reversing regional integration may have broader negative consequences for the world trading system than previously thought.

[33]Notice that our results are not contradicted by the fact that the use of AD measures around the globe has been growing over the last decades. This growth is the result of, among other things, an increasing level of international trade. Actually, our results suggest that we would have seen even more AD measures worldwide had it not been for the PTAs that have been negotiated and implemented.

References

[1] Ahn, Dukgeun, and Wonkyu Shin (2011). "Analysis of Anti-Dumping Use in Free Trade Agreements." *Journal of World Trade*, 45, 431–456.

[2] Allison, Paul D., and Richard P. Waterman (2002). "Fixed-Effects Negative Binomial Regression Models." *Sociological Methodology*, 32, 247–265.

[3] Bagwell, Kyle, and Robert W. Staiger (1990). "A Theory of Managed Trade." *American Economic Review*, 80, 779–795.

[4] Bagwell, Kyle, and Robert W. Staiger (1997a). "Multilateral Tariff Cooperation during the Formation of Free Trade Areas." *International Economic Review*, 38, 291–319.

[5] Bagwell, Kyle, and Robert W. Staiger (1997b). "Multilateral Tariff Cooperation during the Formation of Customs Unions." *Journal of International Economics*, 42, 91–123.

[6] Bagwell, Kyle, and Robert W. Staiger (1999). "Regionalism and Multilateral Tariff Cooperation," in John Piggott and Alan Woodland (eds.), *International Trade Policy and the Pacific Rim*. Palgrave Macmillan.

[7] Bagwell, Kyle, and Robert W. Staiger (2002). *The Economics of the World Trading System*. MIT Press.

[8] Bagwell, Kyle, and Robert W. Staiger (2011). "What Do Trade Negotiators Negotiate About? Empirical Evidence from the World Trade Organization." *American Economic Review*, 101, 1238–1273.

[9] Bhagwati, Jagdish N. (1991). *The World Trading System at Risk*. Princeton University Press.

[10] Blonigen, Bruce A., and Thomas J. Prusa (2003). "Antidumping," in E. Kwan Choi and James Harrigan (eds.), *Handbook of International Trade*. Blackwell Publishing.

[11] Bond, Eric W., Raymond G. Riezman, and Constantinos Syropoulos (2004). "A Strategic and Welfare Theoretic Analysis of Free Trade Areas." *Journal of International Economics*, 64, 1–27.

[12] Bond, Eric W., and Constantinos Syropoulos (1996). "The Size of Trading Blocs: Market Power and World Welfare Effects." *Journal of International Economics*, 40, 411–437.

[13] Bown, Chad P. (2016a). *Global Antidumping Database*. The World Bank.

[14] Bown, Chad P. (2016b). *Global Countervailing Duties Database*. The World Bank.

[15] Bown, Chad P. (2016c). *China-Specific Safeguards Database*. The World Bank.

[16] Bown, Chad P., and Meredith A. Crowley (2007). "Trade Deflection and Trade Depression." *Journal of International Economics*, 72, 176–201.

[17] Bown, Chad P., and Meredith A. Crowley (2013a). "Self-Enforcing Trade Agreements: Evidence from Time-Varying Trade Policy." *American Economic Review*, 103, 1071–1090.

[18] Bown, Chad P., and Meredith A. Crowley (2013b). "Import Protection, Business Cycles, and Exchange Rates: Evidence from the Great Recession." *Journal of International Economics*, 90, 50–64.

[19] Bown, Chad P., and Meredith A. Crowley (2016). "The Empirical Landscape of Trade Policy," in Kyle Bagwell and Robert W. Staiger (eds.), *Handbook of Commercial Policy, Vol. 1A*. Elsevier, North-Holland.

[20] Bown, Chad P., and Patricia Tovar (2016). "Preferential Liberalization, Antidumping, and Safeguards: Stumbling Block Evidence from MERCOSUR." *Economics & Politics*, 28, 262–294.

[21] Broda, Christian, Nuno Limão, and David E. Weinstein (2008). "Optimal Tariffs and Market Power: The Evidence." *American Economic Review*, 98, 2032–2065.

[22] Cameron, Colin A., and Douglas L. Miller (2015). "A Practitioner's Guide to Cluster-Robust Inference." *Journal of Human Resources*, 50, 317–372.

[23] Cruz, Cesi, Philip Keefer, and Carlos Scartascini (2018). *Database of Political Institutions 2017*. Inter-American Development Bank Research Department.

[24] de Sousa, José (2012). "The Currency Union Effect on Trade Is Decreasing over Time." *Economics Letters*, 117, 917–920.

[25] Dür, Andreas, Leonardo Baccini, and Manfred Elsig (2014). "The Design of International Trade Agreements: Introducing a New Database." *Review of International Organizations*, 9, 353–375.

[26] Dutt, Pushan, and Devashish Mitra (2005). "Political Ideology and Endogenous Trade Policy: An Empirical Investigation." *Review of Economics and Statistics*, 87, 59–72.

[27] Estevadeordal, Antoni, Caroline Freund, and Emanuel Ornelas (2008). "Does Regionalism Affect Trade Liberalization toward Nonmembers?" *Quarterly Journal of Economics*, 123, 1531–1575.

[28] Freund, Caroline, and Emanuel Ornelas (2010). "Regional Trade Agreements." *Annual Review of Economics*, 2, 139–166.

[29] Grossman, Gene M., and Elhanan Helpman (1994). "Protection for Sale." *American Economic Review*, 84, 833–850.

[30] Karacaovali, Baybars, and Nuno Limão (2008). "The Clash of Liberalizations: Preferential vs. Multilateral Trade Liberalization in the European Union." *Journal of International Economics*, 74, 299–327.

[31] Knetter, Michael M., and Thomas J. Prusa (2003). "Macroeconomic Factors and Antidumping Filings: Evidence from Four Countries." *Journal of International Economics*, 61, 1–17.

[32] Krugman, Paul R. (1991). "Is Bilateralism Bad?" in Elhanan Helpman and Assaf Razin (eds.), *International Trade and Trade Policy*. MIT Press.

[33] Limão, Nuno (2006). "Preferential Trade Agreements as Stumbling Blocks for Multilateral Trade Liberalization: Evidence for the United States." *American Economic Review*, 96, 896–914.

[34] Limão, Nuno (2016). "Preferential Trade Agreements," in Kyle Bagwell and Robert W. Staiger (eds.), *Handbook of Commercial Policy, Vol. 1B*. Elsevier, North-Holland.

[35] Moore, Michael O., and Maurizio Zanardi (2009). "Does Antidumping Use Contribute to Trade Liberalization in Developing Countries?" *Canadian Journal of Economics*, 42, 469–495.

[36] Ornelas, Emanuel (2005). "Endogenous Free Trade Agreements and the Multilateral Trading System." *Journal of International Economics*, 67, 471–497.

[37] Ornelas, Emanuel (2007). "Exchanging Market Access at the Outsiders' Expense: The Case of Customs Unions." *Canadian Journal of Economics*, 40, 207–224.

[38] Prusa, Thomas J., and Robert Teh (2010). "Protection Reduction and Diversion: PTAs and the Incidence of Antidumping Disputes." NBER Working Paper 16276.

[39] Richardson, Martin (1993). "Endogenous Protection and Trade Diversion." *Journal of International Economics*, 34, 309–324.

[40] Silberberger, Magdalene, and Frederik Stender (2018). "False Friends? Empirical Evidence on Trade Policy Substitution in Regional Trade Agreements." *The World Economy*, 41, 2175–2199.

[41] Tabakis, Chrysostomos (2010). "Customs Unions and Special Protection." *The B.E. Journal of Economic Analysis & Policy*, 10 (Contributions), 1–40.

[42] Tabakis, Chrysostomos (2015). "Free-Trade Areas and Special Protection." *The Journal of International Trade & Economic Development*, 24, 1054–1076.

[43] Tabakis, Chrysostomos, and Maurizio Zanardi (2017). "Antidumping Echoing." *Economic Inquiry*, 55, 655–681.

Figure 1: Customs Unions

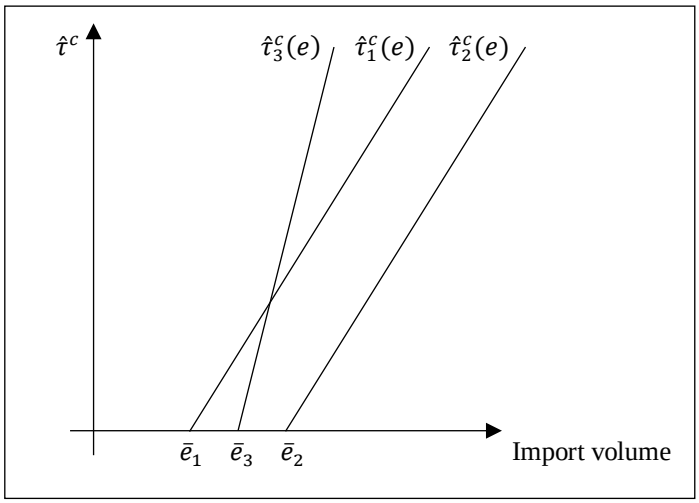

Figure 2: Free-Trade Areas

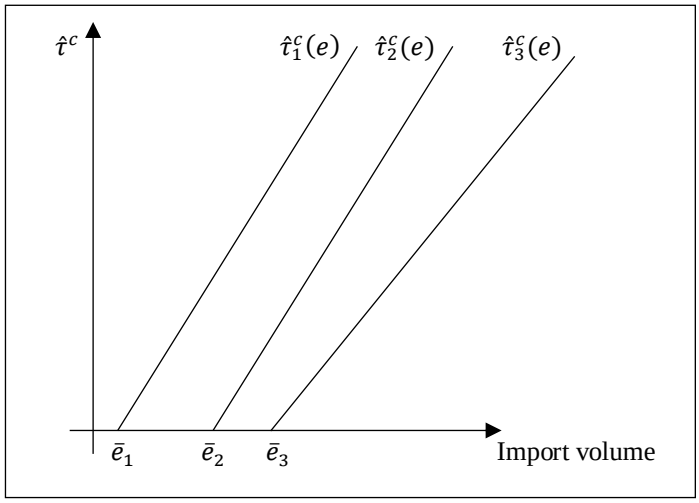

Table 1: Summary statistics on worldwide AD use

Initiations		Initiations per year		Measures		Measures per year	
USA	***1,343***	***USA***	***37.31***	***European Union***	***643***	***India***	***23.25***
European Union	***1,056***	***India***	***31.83***	***USA***	***614***	***European Union***	***17.86***
India	***764***	***European Union***	***29.33***	***India***	***558***	***USA***	***17.06***
Canada	***577***	***Australia***	***21.30***	***Canada***	***350***	***Canada***	***9.72***
Australia	***575***	***Brazil***	***16.07***	***Argentina***	***252***	***China***	***9.58***
Brazil	***450***	***Canada***	***16.03***	***Brazil***	***247***	***Argentina***	***9.33***
Argentina	***380***	***Argentina***	***14.07***	***Turkey***	***214***	***Brazil***	***8.82***
South Africa	***306***	***South Africa***	***13.30***	***Australia***	***204***	***Turkey***	***7.93***
Mexico	***285***	***China***	***12.21***	***China***	***182***	***Australia***	***7.56***
Turkey	***285***	***Turkey***	***10.56***	***South Africa***	***171***	***South Africa***	***7.43***
China	***232***	***Mexico***	***9.83***	***Mexico***	***158***	***Mexico***	***5.45***
South Korea	***166***	Pakistan	6.71	***South Korea***	***93***	Vietnam	4.00
Taiwan	141	***Indonesia***	***6.35***	***Peru***	***63***	Pakistan	3.64
Indonesia	***127***	***South Korea***	***5.53***	***Indonesia***	***61***	Lithuania	3.50
Peru	***115***	***Peru***	***4.79***	***New Zealand***	***56***	***South Korea***	***3.10***
New Zealand	***109***	Taiwan	4.55	Egypt	53	***Indonesia***	***3.05***
Colombia	101	Egypt	4.47	Pakistan	51	Egypt	2.79
Pakistan	94	Colombia	4.04	Thailand	47	Russia	2.73
Egypt	85	Malaysia	4.00	Colombia	44	***Peru***	***2.63***
Malaysia	84	Sweden	4.00	Malaysia	43	Thailand	2.35
Israel	68	Vietnam	4.00	Russia	41	Malaysia	2.05
Thailand	68	Russia	3.53	Taiwan	33	Singapore	2.00
Russia	53	Latvia	3.50	Ukraine	28	Ukraine	1.87
Ukraine	37	Lithuania	3.50	Israel	25	Colombia	1.76
Philippines	29	***New Zealand***	***3.41***	Venezuela	16	***New Zealand***	***1.75***
Chile	28	Thailand	3.40	Philippines	13	Venezuela	1.60
Venezuela	27	Honduras	3.00	Chile	9	Kazakhstan	1.33
Japan	14	Israel	2.72	Finland	9	Poland	1.29
Finland	13	Venezuela	2.70	Japan	9	Taiwan	1.06
Poland	12	Ukraine	2.47	Poland	9	Israel	1.00
Trinidad Tobago	12	Kazakhstan	2.33	Lithuania	7	Finland	0.75
Austria	11	Singapore	2.00	Morocco	7	Morocco	0.70
Costa Rica	11	Poland	1.71	Trinidad Tobago	7	Philippines	0.62
Morocco	9	Czech Republic	1.50	Jamaica	4	Czech Republic	0.50
Sweden	8	Nicaragua	1.50	Kazakhstan	4	Dominican Republic	0.50
Uruguay	8	Philippines	1.38	Vietnam	4	Latvia	0.50
Kazakhstan	7	Chile	1.33	Costa Rica	3	Nicaragua	0.50
Latvia	7	Finland	1.08	Austria	2	Chile	0.43
Lithuania	7	Bulgaria	1.00	Dominican Republic	2	Trinidad Tobago	0.37
Jamaica	6	GCC	1.00	Ecuador	2	Jamaica	0.36
Panama	6	Jordan	1.00	Paraguay	2	Japan	0.36
Ecuador	5	Norway	1.00	Singapore	2	Paraguay	0.33
Vietnam	4	Slovenia	1.00	Uruguay	2	Austria	0.15
Czech Republic	3	Morocco	0.90	Czech Republic	1	Ecuador	0.15
Dominican Republic	3	Austria	0.85	Guatemala	1	Costa Rica	0.15
Honduras	3	Dominican Republic	0.75	Latvia	1	Uruguay	0.11
Nicaragua	3	Trinidad Tobago	0.63	Nicaragua	1	Guatemala	0.05
Guatemala	2	Japan	0.56	Bulgaria	0	Bulgaria	0.00
Paraguay	2	Costa Rica	0.55	GCC	0	GCC	0.00
Singapore	2	Jamaica	0.55	Honduras	0	Honduras	0.00
Bulgaria	1	Panama	0.50	Jordan	0	Jordan	0.00
GCC	1	Uruguay	0.42	Norway	0	Norway	0.00
Jordan	1	Ecuador	0.38	Panama	0	Panama	0.00
Norway	1	Paraguay	0.33	Slovenia	0	Slovenia	0.00
Slovenia	1	Guatemala	0.11	Sweden	0	Sweden	0.00
	7,748				4,348		

Notes: Countries in bold and italics are included in the econometric analysis. GCC stands for the six Middle Eastern countries of the Gulf Cooperation Council.

Table 2: Summary statistics

Variable	Obs.	Average	St. Dev.	Min	Max
$Y_{i,j,t}$ (AD measures)	18,413	0.151	0.669	0	14
PTAs negotiation$_{i,k,t}$	18,413	0.364	0.670	0	5
PTAs implemented$_{i,k,t}$	18,413	0.762	0.924	0	5
FTAs negotiation$_{i,k,t}$	18,413	0.296	0.652	0	5
CUs negotiation$_{i,k,t}$	18,413	0.068	0.251	0	1
FTAs implemented$_{i,k,t}$	18,413	0.556	0.942	0	5
CUs implemented$_{i,k,t}$	18,413	0.206	0.442	0	2
Import growth$_{i,j,t/t-1}$	18,413	0.260	0.884	-1	5.754
ln(Imports)$_{i,j,t-1}$	18,413	19.320	2.814	1.163	26.869
ln(Real exchange rate)$_{i,j,t-1}$	18,413	0.517	3.695	-11.073	10.795
Importer GDP growth$_{i,t/t-3}$	18,413	0.120	0.090	-0.155	0.433
Exporter GDP growth$_{j,t/t-3}$	18,413	0.115	0.095	-0.436	0.532
$Y_{i,j,t}$ (HS lines)	16,882	0.335	1.952	0	29
$Y_{i,j,t}$ (AD, CVD, China-SG measures)	19,185	0.160	0.732	0	19
PTAs negotiation$_{i,k,t}$ (trade share)	18,413	0.080	0.148	0	0.655
PTAs implemented$_{i,k,t}$ (trade share)	18,413	0.146	0.211	0	0.766
FTAs negotiation$_{i,k,t}$ (trade share)	18,413	0.074	0.148	0	0.655
CUs negotiation$_{i,k,t}$ (trade share)	18,413	0.007	0.031	0	0.226
FTAs implemented$_{i,k,t}$ (trade share)	18,413	0.129	0.214	0	0.766
CUs implemented$_{i,k,t}$ (trade share)	18,413	0.017	0.048	0	0.226

Note: Import growth has been winsorized at the 95th percentile and HS lines at the 99th percentile.

Table 3: Step 1

	Benchmark		Alternative dependent variables				Alternative key regressors	
	Count AD		Count HS lines of AD measures		Count AD, CVD, China SG		PTAs measured with trade shares	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PTAs negotiation$_{i,k,t}$	-0.296***	-0.279***	-0.193**	-0.232**	-0.232***	-0.213***	-0.650***	-0.673**
	(0.068)	(0.069)	(0.085)	(0.107)	(0.068)	(0.071)	(0.246)	(0.262)
PTAs implemented$_{i,k,t}$	-0.501***	-0.484***	-0.223**	-0.466***	-0.493***	-0.472***	-2.273***	-2.356***
	(0.121)	(0.117)	(0.105)	(0.160)	(0.119)	(0.115)	(0.326)	(0.335)
Import growth$_{i,j,t/t-1}$	0.083	0.087	0.170*	0.192*	0.085	0.115	0.067	0.101
	(0.070)	(0.078)	(0.102)	(0.107)	(0.071)	(0.077)	(0.068)	(0.071)
ln(Imports)$_{i,j,t-1}$	0.481***	0.553***	0.516***	0.563***	0.489***	0.597***	0.509***	0.632***
	(0.045)	(0.070)	(0.060)	(0.105)	(0.044)	(0.072)	(0.043)	(0.061)
ln(Real exchange rate)$_{i,j,t-1}$	0.767***	0.762***	0.390*	0.815***	0.747***	0.757***	0.744***	0.693***
	(0.125)	(0.135)	(0.208)	(0.239)	(0.131)	(0.139)	(0.125)	(0.130)
Importer GDP growth$_{i,t/t-3}$	0.094	-0.297	0.835	0.405	0.297	-0.224	0.032	-0.462
	(0.487)	(0.500)	(0.733)	(0.818)	(0.507)	(0.531)	(0.476)	(0.488)
Exporter GDP growth$_{j,t/t-3}$	0.001	-0.030	-0.367	-0.111	-0.070	0.017	0.053	-0.033
	(0.378)	(0.390)	(0.570)	(0.646)	(0.388)	(0.407)	(0.389)	(0.402)
Importer FE	Yes		Yes		Yes		Yes	
Exporter FE	Yes		Yes		Yes		Yes	
Importer-Exporter FE		Yes		Yes		Yes		Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,413	9,176	16,882	7,720	19,185	9,493	18,413	9,176
Pseudo R2	0.29	0.24	0.18	0.14	0.28	0.23	0.29	0.24

Note: The table reports the estimated coefficients of negative binomial regressions with standard errors clustered at country-pair level; ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 4: Step 2

	Benchmark		Alternative dependent variables				Alternative key regressors	
	Count AD		Count HS lines of AD measures		Count AD, CVD, China SG		PTAs measured with trade shares	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FTAs negotiation$_{i,k,t}$	-0.156**	-0.144*	0.087	0.092	-0.116*	-0.098	-0.403*	-0.500*
	(0.071)	(0.074)	(0.090)	(0.119)	(0.070)	(0.074)	(0.235)	(0.257)
CUs negotiation$_{i,k,t}$	-0.592***	-0.596***	-1.410***	-1.049***	-0.440**	-0.464**	-3.456	-4.022
	(0.162)	(0.170)	(0.252)	(0.245)	(0.178)	(0.191)	(2.941)	(2.794)
FTAs implemented$_{i,k,t}$	-0.509***	-0.504***	-0.169	-0.431**	-0.510***	-0.497***	-2.267***	-2.405***
	(0.128)	(0.125)	(0.119)	(0.176)	(0.126)	(0.122)	(0.343)	(0.351)
FTAs implemented$_{i,k,t}$ x Import growth$_{i,j,t/t-1}$	-0.149	-0.058	0.075	0.017	-0.128	-0.056	0.030	0.146
	(0.170)	(0.140)	(0.092)	(0.170)	(0.169)	(0.141)	(0.873)	(0.640)
CUs implemented$_{i,k,t}$	-0.317**	-0.377**	-0.235	-0.135	-0.198	-0.274*	0.982	-0.907
	(0.149)	(0.146)	(0.214)	(0.254)	(0.161)	(0.162)	(3.492)	(3.516)
CUs implemented$_{i,k,t}$ x Import growth$_{i,j,t/t-1}$	0.373***	0.386***	0.402**	0.541***	0.390***	0.385***	3.922***	5.652***
	(0.113)	(0.115)	(0.168)	(0.194)	(0.113)	(0.115)	(0.709)	(1.124)
Import growth$_{i,j,t/t-1}$	0.023	0.015	0.099	0.059	0.018	0.040	-0.039	-0.035
	(0.089)	(0.092)	(0.112)	(0.107)	(0.088)	(0.092)	(0.084)	(0.088)
ln(Imports)$_{i,j,t-1}$	0.474***	0.536***	0.517***	0.519***	0.481***	0.579***	0.499***	0.610***
	(0.043)	(0.067)	(0.059)	(0.100)	(0.043)	(0.071)	(0.042)	(0.059)
ln(Real exchange rate)$_{i,j,t-1}$	0.781***	0.776***	0.402**	0.822***	0.756***	0.764***	0.755***	0.711***
	(0.128)	(0.139)	(0.201)	(0.237)	(0.133)	(0.141)	(0.127)	(0.137)
Importer GDP growth$_{i,t/t-3}$	0.226	-0.218	1.139	0.882	0.495	-0.072	0.085	-0.489
	(0.516)	(0.537)	(0.725)	(0.840)	(0.540)	(0.580)	(0.492)	(0.511)
Exporter GDP growth$_{j,t/t-3}$	-0.114	-0.143	-0.537	-0.331	-0.178	-0.091	-0.084	-0.097
	(0.386)	(0.394)	(0.558)	(0.652)	(0.396)	(0.411)	(0.410)	(0.425)
Importer FE	Yes		Yes		Yes		Yes	
Exporter FE	Yes		Yes		Yes		Yes	
Importer-Exporter FE		Yes		Yes		Yes		Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,413	9,176	16,882	7,720	19,185	9,493	18,413	9,176
Pseudo R2	0.29	0.24	0.19	0.14	0.28	0.23	0.29	0.24

Note: The table reports the estimated coefficients of negative binomial regressions with standard errors clustered at country-pair level; ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 5: Quantification exercise

	Count AD	Count HS lines of AD measures	Count AD, CVD, China-SG	PTAs measured with trade shares
	(1)	(2)	(3)	(4)
(1) C(FTAs negotiation=0, FTAs implemented=0	0.426***	1.132***	0.463***	0.448***
(2) C(FTAs negotiation=1, FTAs implemented=0)	0.369***	1.241***	0.420***	0.414***
Percentage change compared with (1)	-13.437%**	9.605%	-9.353%	-7.702%**
(3) C(FTAs negotiation=0, FTAs implemented=1, imp. growth=25th pct)	0.254***	0.716***	0.277***	0.234***
Percentage change compared with (1)	-40.432%***	-36.808%***	-40.205%***	-47.684%***
(4) C(FTAs negotiation=0, FTAs implemented=1, imp. growth=75th pct)	0.257***	0.759***	0.282***	0.240***
Percentage change compared with (1)	-39.731%***	-33.014%***	-39.077%***	-46.387%***
(5) C(CUs negotiation=0, CUs implemented=0)	0.362***	0.899***	0.369***	0.312***
(6) C(CUs negotiation=1, CUs implemented=0)	0.199***	0.315***	0.232***	0.245***
Percentage change compared with (7)	-44.892%***	-64.967%***	-37.117%***	-21.589%
(7) C(CUs negotiation=0, CUs implemented=1, imp. growth=25th pct)	0.244***	0.758***	0.275***	0.286***
Percentage change compared with (7)	-32.481%***	-15.664%	-25.479%**	-8.310%
(8) C(CUs negotiation=0, CUs implemented=1, imp. growth=75th pct)	0.273***	0.913***	0.310***	0.325***
Percentage change compared with (7)	-24.362%**	1.585%	-15.918%	4.103%
Importer-Exporter FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Test (1) = (2), z-statistics	1.85*	-0.77	1.28	1.81*
Test (1) = (3), z-statistics	3.55***	2.03**	3.52***	5.49***
Test (1) = (4), z-statistics	3.37***	1.81*	3.32***	5.45***
Test (3) = (4), z-statistics	-0.27	-0.86	-0.43	-0.49
Test (5) = (6), z-statistics	3.90***	4.48***	2.69***	1.46
Test (5) = (7), z-statistics	2.68***	0.68	1.85*	0.32
Test (5) = (8), z-statistics	1.93*	-0.06	1.09	-0.15
Test (7) = (8), z-statistics	-3.15***	-2.54**	-3.24***	-3.48***
Observations	9,176	7,720	9,493	9,176

Notes: The table reports average predicted counts for columns (2), (4), (6) and (8) of Table 4 conditioning on the variables in the C(•) function (in Table 5) taking on the specified values while the other variables are taking their actual values. In column (4), the values for negotiation and implemented equal to 1 are given by the mean of the relevant regressor (conditional on FTAs or CUs being under negotiation or in force). ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 6: Robustness checks

	Ideology		All dyads		Trade share as 'y'		5% threshold		Log versions	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FTAs negotiation$_{i,k,t}$	-0.126*	-0.113	0.052	0.017	0.116	0.128	-0.063	-0.058	-0.192*	-0.176
	(0.076)	(0.080)	(0.054)	(0.054)	(0.076)	(0.095)	(0.062)	(0.064)	(0.108)	(0.115)
CUs negotiation$_{i,k,t}$	-0.529***	-0.549***	-0.410***	-0.554***	-0.520***	-0.515***	-0.569***	-0.544***	-0.763***	-0.770***
	(0.162)	(0.170)	(0.140)	(0.159)	(0.141)	(0.149)	(0.156)	(0.154)	(0.238)	(0.249)
FTAs implemented$_{i,k,t}$	-0.699***	-0.681***	-0.127*	-0.166**	-0.243***	-0.311***	-0.495***	-0.504***	-0.841***	-0.852***
	(0.114)	(0.116)	(0.073)	(0.081)	(0.083)	(0.094)	(0.123)	(0.123)	(0.193)	(0.195)
FTAs implemented$_{i,k,t}$ x Import growth$_{i,j,t/t-1}$	-0.357**	-0.255*	-0.149	-0.069	0.065	0.142	0.085	0.095	-0.271	-0.123
	(0.169)	(0.151)	(0.114)	(0.098)	(0.100)	(0.164)	(0.178)	(0.133)	(0.258)	(0.210)
CUs implemented$_{i,k,t}$	-0.410***	-0.449***	0.054	-0.171	-0.476***	-0.540***	-0.375**	-0.421***	-0.321	-0.441*
	(0.135)	(0.136)	(0.122)	(0.121)	(0.147)	(0.160)	(0.150)	(0.150)	(0.252)	(0.254)
CUs implemented$_{i,k,t}$ x Import growth$_{i,j,t/t-1}$	0.264**	0.257*	0.311***	0.288**	0.266**	0.400***	0.323**	0.272**	0.543***	0.569***
	(0.129)	(0.131)	(0.108)	(0.114)	(0.118)	(0.154)	(0.140)	(0.139)	(0.168)	(0.174)
Import growth$_{i,j,t/t-1}$	0.031	0.031	0.095	0.085	-0.221**	-0.334**	-0.018	-0.007	0.024	0.018
	(0.091)	(0.093)	(0.080)	(0.082)	(0.110)	(0.156)	(0.109)	(0.106)	(0.091)	(0.094)
ln(Imports)$_{i,j,t-1}$	0.479***	0.564***	0.557***	0.571***	0.027	-0.044	0.488***	0.566***	0.479***	0.547***
	(0.044)	(0.070)	(0.037)	(0.063)	(0.024)	(0.049)	(0.042)	(0.061)	(0.043)	(0.066)
ln(Real exchange rate)$_{i,j,t-1}$	0.796***	0.794***	0.800***	0.752***	0.229***	0.336***	0.787***	0.767***	0.768***	0.756***
	(0.135)	(0.146)	(0.122)	(0.128)	(0.085)	(0.094)	(0.128)	(0.136)	(0.129)	(0.139)
Importer GDP growth$_{i,t/t-3}$	0.280	-0.219	-0.091	-0.327	-0.244	-0.132	0.100	-0.271	0.298	-0.152
	(0.576)	(0.596)	(0.461)	(0.478)	(0.512)	(0.537)	(0.524)	(0.539)	(0.515)	(0.535)
Exporter GDP growth$_{j,t/t-3}$	-0.091	-0.127	-0.054	0.039	-0.187	-0.229	-0.062	-0.077	-0.129	-0.175
	(0.385)	(0.387)	(0.362)	(0.364)	(0.516)	(0.591)	(0.381)	(0.387)	(0.389)	(0.398)
Ideology$_{i,t}$	-0.773***	-0.823***								
	(0.143)	(0.148)								
ln(K/L)$_{i,t}$	-0.002	-0.164								
	(0.200)	(0.214)								
Ideology$_{i,t}$ x ln(K/L)$_{i,t}$	0.204***	0.209***								
	(0.031)	(0.032)								
Negotiation dummy$_{i,j,t}$			-0.001	0.054						
			(0.109)	(0.125)						
PTA dummy$_{i,j,t}$			-0.166	-0.307**						
			(0.133)	(0.135)						
Importer FE	Yes		Yes		Yes		Yes		Yes	
Exporter FE	Yes		Yes		Yes		Yes		Yes	
Importer-Exporter FE		Yes		Yes		Yes		Yes		Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,034	8,819	23,336	11,886	15,747	7,503	18,413	9,176	18,413	9,176
Pseudo R2	0.30	0.25	0.29	0.23	0.17	0.22	0.29	0.24	0.29	0.24

Note: The table reports the estimated coefficients of negative binomial regressions (fractional probit in columns 5-6) with standard errors clustered at country-pair level; ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table A1: PTAs included in the analysis

PTA name	Importing countries for which PTA is relevant	Type of PTA	Still under negotiation
AFTA	*Indonesia*	*FTA*	*no*
ASEAN-Australia-New Zealand	Australia, New Zealand, Indonesia	FTA	no
ASEAN-China	China, Indonesia	FTA	no
ASEAN-India	*India*	*FTA*	*no*
ASEAN-India	Indonesia	FTA	no
ASEAN-Japan	Indonesia	FTA	no
ASEAN-South Korea	*South Korea*	*FTA*	*no*
ASEAN-South Korea	Indonesia	FTA	no
Australia-China	Australia	FTA	no
China-New Zealand	New Zealand	FTA	no
China-South Korea	*China*	*FTA*	*no*
China-South Korea	South Korea	FTA	no
CUSFTA	Canada, USA	FTA	no
EU12 enlargement	*EU*	*CU*	*no*
EU15 enlargement	EU	CU	no
EU25 enlargement	EU	CU	no
EU-Canada	Canada	FTA	yes
EU-Columbia-Peru-Ecuador	Peru	FTA	no
EU-India	India	FTA	yes
EU-Indonesia	*Indonesia*	*FTA*	*yes*
EU-Mexico	*Mexico*	*FTA*	*no*
EU-SADC EPA	South Africa	FTA	yes
EU-South Africa	South Africa	FTA	no
EU-South Korea	*South Korea*	*FTA*	*no*
EU-Turkey	Turkey	CU	no
Japan-Australia	*Australia*	*FTA*	*no*
Japan-Indonesia	*Indonesia*	*FTA*	*no*
Japan-South Korea	South Korea	FTA	yes
MERCOSUR	Argentina, Brazil	CU	no
NAFTA	Canada, Mexico, USA	FTA	no
Peru-China	Peru	FTA	no
South Korea-US	*South Korea*	*FTA*	*no*
TTIP	EU, USA	FTA	yes
US-Australia	Australia	FTA	no
US-Peru	Peru	FTA	no

Notes: Agreements are classified as still under negotiation based on their status at the end of 2015. Agreements in italics are included when using the 5% threshold.

Table A2: Sample period for included importing countries

Country	First year	Last year
Argentina	1989	2015
Australia	1989	2015
Brazil	1988	2015
Canada	1980	2015
China	1997	2015
European Union	1980	2015
India	1992	2015
Indonesia	1996	2015
Mexico	1987	2015
New Zealand	1982	2015
Peru	1992	2015
South Africa	1992	2015
South Korea	1986	2015
Turkey	1989	2015
USA	1980	2015