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Antidumping Echoing

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Abstract

This paper examines the determinants of "echoing" in antidumping (AD) cases (i.e., different countries sequentially imposing AD measures on the same product from the same exporter). We develop a dynamic game in which two competing importers can choose to impose an AD duty on a third exporting country in one of two periods, if at all. Assuming that governments are politically motivated (favoring their import-competing industries), we find that a country imposes an AD duty in the first (second) period independently of the other country's actions if its political-economy parameter is "very high" ("high"). Instead, it never introduces AD measures when its political-economy parameter is below a critical "low" threshold. Echoing occurs for intermediate values of the political-economy parameter: a country chooses to impose an AD duty in the second period if and only if the competing importer has done so in the first period. Using a novel AD dataset, we document that echoing is a common practice among both traditional and new users of AD. In line with the conclusions of the theoretical model, the econometric results show that AD measures are more likely to be introduced in response to other countries' measures when governments care to some extent, but not too much, about their import-competing industries. Thus, this paper shows that countries' political-economy-driven trade policies are interdependent and should not be analyzed in isolation.

Keywords: Antidumping; political economy of trade protection.
JEL classification: F12, F13, F14.

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1 Introduction

With the worldwide decrease in applied tariff rates and the strengthening of countries' trade commitments with the World Trade Organization (WTO), other forms of trade policies have become more important. Antidumping (AD) is among the most widely and commonly used instruments to grant trade protection. Its stated objective is to eliminate the injurious effects of dumping (i.e., exporting at less than fair value). However, the discretionary application in practice of AD measures makes AD "simply another form of protection" (Blonigen and Prusa, 2003), which is regularly used by a large number of developed and developing countries.

The nature of AD, and in particular its discriminatory application among countries and among exporting firms within a country, has given rise to a long literature that has examined its strategic effects, as well as its effects on trade flows. As is also the case with other trade instruments, it has been shown that the introduction of AD measures responds to political pressures, despite the fact that the rhetoric behind AD is that it simply addresses cases of unfair competition (i.e., dumping). The survey by Blonigen and Prusa (2003) provides a detailed overview of the AD system and of the various effects that AD can give rise to.

From an empirical perspective, the most astonishing fact is that the set of countries that currently use AD on a regular basis has become much larger in the last two decades. While only a handful of developed countries used AD before the 1990s, developing countries such as Brazil, China, and India began using AD in the late 1990s and are nowadays among its most active users, targeting both developed and developing countries in their AD investigations. Moreover, a casual look at the data reveals that the same products exported by the same country are systematically subject to AD measures in multiple importing countries at the same time. Maur (1998) was the first to detect several such occurrences between Canada, the European Union (EU), and the US. He defined "antidumping cases targeting in different importing countries similar products originating in the same exporting country" as AD echoing. Some anecdotal evidence (e.g., announcements in the popular press; Bown, 2009) suggests that echoing may still be a relevant feature of global AD use, and this paper aims at analyzing its occurrence and determinants by pursuing three main objectives.

The first objective of this paper is to verify the relevance of AD echoing and provide a

quantification of its extent. We have assembled worldwide AD data for the period 1980–2005 and identified echoing by matching cases from different importing countries based on the classification of the products under investigation and the timing of the AD measures. This data-intensive process shows that AD echoing is indeed still quite common and involves many cases from the new users of AD. All the cases of echoing identified in our novel dataset are listed in Table 1. Clearly, there are many occurrences of echoing and they are quite heterogenous. They could involve just two importing countries, as in the case of pneumatic tires for bicycles exported by China and subject to AD measures in Argentina and Turkey in 2003. But they can also involve several importing countries, as in the case of synthetic staple fibers exported by South Korea and targeted with AD measures in six importing countries in the early 2000s.[1] The "length" of Table 1 makes clear that echoing is a much more widespread phenomenon than originally highlighted by Maur (1998), and is certainly not relevant only for developed countries. More details and summary statistics (by countries and sectors) of echoing are presented in Section 4, but we can quantify its overall extent by noting that 20.5% of all AD petitions in our sample that were concluded with the imposition of measures are involved in echoing.

Having established that echoing is an empirically relevant phenomenon, the second objective of this paper is to provide a simple model to explain its occurrence. To this end, we develop a four-period, two-stage dynamic game in which two competing importers can endogenously choose to impose an AD duty on a third exporting country in one of two periods, if at all. Firms compete in quantities, and face an increasing marginal cost of production and segmented markets. Furthermore, in line with the empirical literature on AD, we assume that governments are politically motivated (favoring their import-competing industries). The prediction of our model is intuitive but not necessarily obvious. We find that if a country's political-economy parameter exceeds a critical "very high" threshold, it then chooses to impose an AD duty in the first period independently of the other country's actions. If the parameter in question is not "very high" but is still sufficiently "high," it only does so in the second period. On the other hand, if its political-economy parameter is below a critical "low" threshold, the country never imposes a duty since the associated costs outweigh the expected

[1] At most 11 importing countries are part of an echoing case in our sample.

political (and terms-of-trade) gains. Finally, for intermediate values of the political-economy parameter, we observe echoing: a country chooses to impose a duty in the second period if and only if the competing importer has done so in the first period.

The third objective of this paper is to provide an econometric analysis of echoing to shed some light on its determinants. The analysis is motivated by our theoretical model, which suggests that the AD measures of a country affect other countries' decision to impose AD measures only for intermediate values of the political-economy parameter, since a country would independently introduce such measures if it cared a lot about its import-competing industries. The analysis is based on the 15 most active users of AD, which together account for over 90% of the total number of AD petitions in our sample period. The level of the analysis is quite disaggregated, as we look at the probability that an importing country imposes AD measures against exports from a given trading partner in any of the 4-digit Harmonized System (HS) categories. The key variable of interest is the interaction between the AD actions taken by other countries and the country-specific political-economy parameter, which is proxied by the sectoral use of AD in each country. Using different samples and alternative formulations of the political-economy parameter, the results are robust and confirm that echoing occurs as a result of other countries' AD measures when the government of an importing country cares enough, but not too much, about its import-competing industries. To sum up, the theoretical model and the empirical analysis show that the political-economy channels that lead to certain policy actions should be viewed as part of an interdependent decision process across countries. Thus, countries' trade policies should not be analyzed individually but jointly in order to explicitly take into account their feedback effects.

Our paper contributes to the literature analyzing the country-level reactions induced by the introduction of AD measures.[2] Various empirical papers have documented the extent (if any) of trade diversion due to AD, whereby imports of goods subject to AD decrease from the target country but increase from other sources. Prusa (1997) finds substantial trade-diversion effects for US AD measures, while Konings et al. (2001) find no such effect for a sample of EU AD cases.[3] Similarly, Ganguli (2008) and Park (2009) document significant

[2]There is also a (short) literature on how individual firms react to the introduction of AD measures (see footnote 8 for some references).

[3]However, Brenton (2001) does find evidence of trade-diversion effects in the case of EU AD measures.

AD trade-diversion effects for India and China, respectively. Along these lines, Bown and Crowley (2007) is the paper closest in spirit to our analysis. They find clear evidence of significant distortions in trade flows as a result of AD, as Japanese exports targeted by US AD measures are rerouted to third countries (i.e., trade deflection takes place), while Japanese exports decrease to third countries targeted by US AD actions (i.e., trade depression occurs). Although Bown and Crowley (2007) look at reactions of trade flows to AD restrictions, they do not consider the sequential imposition of measures on a given product exported by a given country.

In terms of the theoretical model, our approach is clearly inspired by Farrell and Saloner (1985) who develop a two-period incomplete-information model in which two users choose to either stick to an old technology or adopt a new one. Furthermore, our work is at a broad level influenced by the extensive literature on endogenous sequencing (or not) of firm quantity or pricing decisions. For instance, Hamilton and Slutsky (1990) consider a two-period quantity game with perfect and complete information, Robson (1990) looks at a price-setting duopoly, Mailath (1993) examines a quantity-setting duopoly game with asymmetrically informed firms, and Daughety and Reinganum (1994) employ a two-period homogeneous-good duopoly model wherein information can be acquired by agents.

The remainder of the paper is organized as follows. Section 2 provides a brief overview of AD practices. The theoretical model and its equilibrium characterization appear in Section 3, while the data and the empirical analysis are presented in Section 4. Section 5 concludes.

2 Features of Antidumping Practices

Dumping has a long history in international trade as demonstrated by Viner (1923) in the chapter on "The Prevalence of Dumping Prior to 1890" in his seminal contribution on dumping. Instead, the history of AD, as a way to offset the effects of dumping, starts in the 20th century, with Canada being the first country to adopt an AD law in 1904. From the very beginning, the use of AD was motivated by the unfairness of dumping strategies. The same motivation justifies the use of AD, as an exception to the principle of non-discrimination, within the General Agreement on Tariffs and Trade (GATT)/WTO.

Moving to more recent times, it is a well-known fact that AD policies are not anymore used only by a few industrialized countries as it was in the 1980s when Australia, Canada, the EU, New Zealand, and the US (i.e., the so-called traditional users) were the major, if not only, users of this policy instrument. Nowadays, countries such as Argentina, Brazil, China, and India, to name just a few, top the rankings of AD use as published by the WTO. Overall, more than 40 countries have used AD in the last two decades with many more countries having a dormant AD law.[4]

Despite the large and heterogeneous group of countries applying AD measures, the general practices of these policies are fairly similar across countries since they have to adhere to the Antidumping Agreement of the WTO, which is automatically binding for all WTO member countries.[5] The motivation for the use of AD measures comes from Article VI of GATT 1994 which "recognize[s] that dumping, by which products of one country are introduced into the commerce of another country at less than the normal value of the products, is to be condemned if it causes or threatens material injury to an established industry ... or materially retards the establishment of a domestic industry." In just a few lines, this article provides a definition of dumping (i.e., selling at less than fair value, which can occur when exporting at a price below cost or below the price in the home market) and lays out the necessary conditions for the use of AD (i.e., dumping and (threatened) material injury due to dumping).

In practice, an AD case begins when a domestic industry petitions its government for the introduction of AD measures against firms from specific foreign countries. If such a petition is accepted (i.e., it fulfills all the requirements), an investigation is carried out to verify the existence of dumping and material injury. While in most countries one governmental agency is in charge of verifying both, in some countries (e.g., China, US) two different authorities investigate the existence of dumping and of material injury. The investigation develops into a preliminary and final stage, and should be concluded within one year (except in special circumstances when the investigation may last up to 18 months). AD measures can be imposed as soon as affirmative preliminary findings are reached, while the investigations are concluded

[4] See, among others, Zanardi (2004) for an account of the worldwide growing use of AD. See, also, Vandenbussche and Zanardi (2008) for an empirical analysis of the determinants of the adoption and first use of AD laws.

[5] WTO member countries are not obliged to have an AD law, but if they do have one, it has to be consistent with the agreement in question, which, in any case, leaves some flexibility for its implementation.

at the preliminary stage in case of negative findings of dumping and/or injury.[6] If the investigation continues to the final stage, an affirmative decision will lead to the imposition of final measures lasting maximum five years, except if extended (always by sequences of maximum five years) through reviews because of evidence of continuing dumping and injury.[7] AD measures can take different forms: ad valorem or specific duties, or price undertakings by which foreign exporters commit to stop dumping. In either case, the measures are not only country- but also firm-specific (and within a country some firms may also be found not guilty and be exonerated from any measure). Thus, AD measures are an exception to the non-discrimination principle of the WTO since they are applied only against some countries and to a different degree among exporters of a given good (or goods) from a given country. Once measures are in place, they can be reviewed at the request of interested parties for possible adjustments.[8] Similarly, reviews are conducted if an interested party requests the extension of the measures past their initial validity period.

3 The Model

We now develop a simple model in order to provide a theoretical explanation for the occurrence of AD echoing. More specifically, we present a four-period, two-stage game in which two competing importers can choose to impose an AD duty on a third exporting country in one of two periods, if at all. The first stage is the "AD initiation stage," where the former decide on whether to initiate an AD case against the latter and if so, in which of two periods. The second stage is the "AD implementation stage," where the AD duties are optimally determined in accordance with the stage-1 decisions. Markets are segmented and firms compete in quantities. The governments' choice to introduce AD measures is partly determined by their desire to maximize national welfare; however, policymakers are politically motivated, attaching an extra weight to the profits of their domestic import-competing industry in the objective function they seek to maximize.

[6] An investigation can also be terminated at the request of the filing industry.

[7] See Moore (2006) and Cadot et al. (2007) for an analysis of the length of AD measures and the effect of the WTO provisions introduced in 1995 on the mandatory five-year reviews.

[8] DeVault (1996), Blonigen and Park (2004), Reynolds and Gourlay (2012), and Nita and Zanardi (2013) look at the changes in the level of (US and EU) AD duties during the period they are in force.

3.1 Consumption and Production

We assume the world consists of three countries, A, B, and C. There exists one firm in each country, which produces a single good for domestic consumption and for export. Let us index both countries and firms by i or $j \in \{A, B, C\}$ so that the output produced by firm i for consumption in country j is denoted by q_i^j. Markets are segmented and firms compete in quantities à la Cournot. The production technology is identical across countries and is characterized by increasing marginal cost. In particular, the total cost of production for firm i is given by:

$$c(x_i) = \frac{x_i^2}{2}, \tag{1}$$

where $x_i = \sum_j q_i^j$ is firm i's total output (i.e., the sum of firm i's domestic sales and exports to the two foreign markets). From equation (1), we have that $\forall x_i > 0$, $(\partial c(x_i)/\partial x_i) = x_i > 0$ and $(\partial^2 c(x_i)/\partial x_i^2) = 1$.

On the consumption side, inverse demand in all countries is of the linear form:

$$P\left(Q^j\right) = \alpha - \beta Q^j, \tag{2}$$

where α and β are positive constants, and $Q^j = \sum_i q_i^j$ is the total output sold in country j, (i.e., Q^j equals the sum of sales in country j by domestic firm j and by the two foreign firms).

Firm i's aggregate profit from sales in all three markets equals:

$$\pi_i = \sum_j \left[P\left(Q^j\right) q_i^j - \tau_i^j q_i^j\right] - c(x_i), \tag{3}$$

where τ_i^j, $i \neq j$, denotes country j's specific AD duty on imports from country i, and τ_i^i is equal to zero. It is immediate to show that $\left(\partial^2 \pi_i / \partial q_i^j \partial q_{-i}^j\right) = -\beta < 0$, where $-i \in \{A, B, C\} \setminus \{i\}$, meaning that there is (strict) strategic substitutability between the different firms' choice variables. Each firm chooses three quantities, and setting $(\partial \pi_i / \partial q_i^j) = 0$ for $j \in \{A, B, C\}$, we obtain the following three equations for firm i:

$$q_i^j = \frac{\alpha - \beta \sum_{-i} q_{-i}^j - \tau_i^j - \sum_{-j} q_i^{-j}}{2\beta + 1}, \tag{4}$$

where $-j \in \{A, B, C\} \setminus \{j\}$. The solution to the system of the nine first-order conditions (i.e., three for each firm) provides us with the Cournot Nash equilibrium quantities sold by each firm in each market.

Notice that because the marginal cost of production is increasing, each firm's output choices across markets are interdependent. This implies that if there is any change in the trade barriers faced by a firm in any of the markets, the firm will readjust its Cournot Nash equilibrium quantities in all markets.

3.2 Antidumping Decisions

Governments decide on the introduction of AD measures partly with the objective of maximizing national welfare. However, they are politically motivated, attaching an extra weight to the domestic firm's profit in their objective function. More specifically, the objectives of country j's government are represented by:

$$W^j = \int_{P(Q^j)}^{\alpha} Q(P)\, dP + \theta^j \pi_j + \sum_{-j} \left(\tau^j_{-j} q^j_{-j} - K^j_{-j} \right), \tag{5}$$

where $\theta^j \geq 1$ is a political-economy parameter capturing the degree of political motivation of country j's government, and $K^j_{-j} \geq 0$ is the (fixed) cost for country j associated with the imposition of an AD duty on imports from country $-j$.[9] We maintain the assumptions that countries' political-economy parameters are (i) private information; and (ii) a priori independently drawn from the uniform distribution on $\left[\underline{\theta}, \overline{\theta}\right]$, with $\underline{\theta} \geq 1$, and this is common knowledge.

In order to keep our analysis as simple as possible, we consider the case where only countries B and C have the ability to introduce AD duties and only against exports from country A. In particular, in what follows we assume that (i) country A has no AD legislation in place; and (ii) K^B_C, K^C_B are prohibitively high, implying that (in equilibrium) $\tau^B_C = \tau^C_B = 0$. Furthermore, we impose symmetry in the AD cost: $K^B_A = K^C_A \equiv \widetilde{K}$.

The countries face a two-stage, four-period horizon, with each stage consisting of two periods, as illustrated in Figure 1. Stage 1 is the "AD initiation stage." More specifically, in this first two-period stage, each of countries B and C has the option of initiating an AD case against country A in period 1 or period 2 or not at all. Stage 2 is the "AD implementation stage." In particular, should an AD case be initiated in either period of stage 1, then the level

[9] Notice that $K^j_{-j} = 0$ if and only if $\tau^j_{-j} = 0$.

of the AD duty is optimally determined in the corresponding period of stage 2. For instance, if countries B and C both choose to initiate an AD case against A in the second period of stage 1, then they simultaneously pick their AD duty in the second period of stage 2. Markets clear and payoffs are realized at the end of stage 2.

Our two-stage, four-period game structure can be justified on two grounds. First, it is realistic as an AD investigation takes time to be concluded. Second, it considerably simplifies our analysis, especially with regard to the characterization of the optimal AD duties.

3.3 Equilibrium

In order to shed some light on the occurrence of AD echoing, we look for a symmetric perfect Bayesian equilibrium for this game, in which:[10]

(a) For $k \in \{B, C\}$ and $-k \in \{B, C\} \setminus \{k\}$, (i) if country k's political-economy parameter $\theta^{\star\star\star} \leq \theta^k \leq \overline{\theta}$, then country k initiates an AD case against country A in the first period of stage 1; (ii) if $\theta^{\star\star} \leq \theta^k < \theta^{\star\star\star}$, country k initiates an AD case against country A in the second period of stage 1; (iii) if $\theta^{\star} \leq \theta^k < \theta^{\star\star}$, then country k initiates an AD case against country A in the second period of stage 1 if and only if country $-k$ has done so in the first period of stage 1; and (iv) if $\underline{\theta} \leq \theta^k < \theta^{\star}$, country k never initiates an AD case against country A, where the critical values $\theta^{\star\star\star}$, $\theta^{\star\star}$, and $\theta^{\star}$ are common for both countries B and C.

(b) If, in accordance with equilibrium condition (a), country k initiates an AD case against country A in either period of stage 1, the AD duty level it selects in the corresponding period of stage 2 is optimal given the beliefs of countries B and C, at that point in the game, about each other's political-economy parameter.

(c) The aforementioned beliefs are obtained from the equilibrium strategies of countries B and C and from their observed actions using Bayes' rule.

[10] Notice that if $\widetilde{K}$ were equal to zero (i.e., if AD were costless), countries B and C would always choose to impose AD measures against A even for $\theta = 1$ due to terms-of-trade considerations (as these are "large" countries).

As summarized in Figure 2, this equilibrium defines three critical values that divide the interval $\left[\underline{\theta}, \overline{\theta}\right]$ in four parts. It is intuitive to understand that, ceteris paribus, higher values of the political-economy parameter θ will result in AD measures being introduced independently of the competing importer's actions (i.e., for $\theta \geq \theta^{\star\star}$). However, AD echoing occurs for intermediate values of the parameter space, when the political motivation is not strong enough for independent action, but the policymaker is still sufficiently motivated to initiate an AD case if another country has done so in the previous period. The reason is that in such case, trade deflection would take place, hurting the domestic firm and thereby, raising the incentive of the policymaker to provide some protection to the latter.

We now characterize the equilibrium of our two-stage, four-period game. To this end, let us fix the critical values for country C (such that $\overline{\theta} \geq \theta^{C\star\star\star} > \theta^{C\star\star} > \theta^{C\star} > \underline{\theta}$) and let us assume that countries B and C behave in equilibrium as described above.

The value of $\theta^{B\star}$ is such that, in expected terms and given that country C has initiated an AD case against A in the first period of stage 1, country B is indifferent between never initiating an AD case against A and initiating one in the second period of stage 1. In the latter case, country B will act as a Stackelberg follower in the AD duty game with country C in stage 2. Analytically, $\theta^{B\star}$ is implicitly defined by:

$$\begin{aligned} & E^B\left[W^B_{FOLLOWER}\left(\theta^{B\star}, \theta^C, \widetilde{E}^C\left(\theta^B\right)\right)|\theta^C \geq \theta^{C\star\star\star}\right] - \widetilde{K} \\ & \quad = E^B\left[W^B_{NODUTY}\left(\theta^{B\star}, \theta^C\right)|\theta^C \geq \theta^{C\star\star\star}\right], \end{aligned} \tag{6}$$

where $W^B_{FOLLOWER}$ is the payoff for country B when acting as a Stackelberg follower, W^B_{NODUTY} is country B's payoff under the scenario where it does not impose an AD duty on A while country C does so, E is the expectations operator, and $\widetilde{E}^C\left(\theta^B\right)$ represents country C's updated beliefs about θ^B.

The middle critical value, $\theta^{B\star\star}$, is obtained by considering the condition such that, given that neither country has initiated an AD case against A in period 1 of stage 1, country B is indifferent between initiating a case in the second period of stage 1 and not taking any AD action in period 2 either. The expected payoffs of these two actions depend on whether country C will initiate an AD case in period 2 (with probability $\left(\theta^{C\star\star\star} - \theta^{C\star\star}\right) / \left(\theta^{C\star\star\star} - \underline{\theta}\right)$, in which case country B could either be in a Cournot game or receive W^B_{NODUTY}) or not (with

probability $\left(\theta^{C\star\star}-\underline{\theta}\right)/\left(\theta^{C\star\star\star}-\underline{\theta}\right)$, in which case country B could be either a monopolist or in a situation of free trade). The following equation formally states this condition and implicitly defines $\theta^{B\star\star}$:

$$\begin{aligned}\frac{\theta^{C\star\star\star}-\theta^{C\star\star}}{\theta^{C\star\star\star}-\underline{\theta}}&\left\{E^{B}\left[W^{B}_{COURNOT}\left(\theta^{B\star\star},\theta^{C},E^{B}\left(\theta^{C}\right),\widetilde{E}^{C}\left(\theta^{B}\right)\right)|\theta^{C\star\star}\leq\theta^{C}<\theta^{C\star\star\star}\right]-\widetilde{K}\right\}\\&+\frac{\theta^{C\star\star}-\underline{\theta}}{\theta^{C\star\star\star}-\underline{\theta}}\left[W^{B}_{MONOPOLIST}\left(\theta^{B\star\star}\right)-\widetilde{K}\right]\\&=\frac{\theta^{C\star\star\star}-\theta^{C\star\star}}{\theta^{C\star\star\star}-\underline{\theta}}E^{B}\left[W^{B}_{NODUTY}\left(\theta^{B\star\star},\theta^{C}\right)|\theta^{C\star\star}\leq\theta^{C}<\theta^{C\star\star\star}\right]\\&+\frac{\theta^{C\star\star}-\underline{\theta}}{\theta^{C\star\star\star}-\underline{\theta}}\left[W^{B}_{FREETRADE}\left(\theta^{B\star\star}\right)\right],\end{aligned}\tag{7}$$

where $W^{B}_{COURNOT}$ is the payoff for country B in the scenario where countries B and C simultaneously pick an AD duty vis-à-vis country A, $W^{B}_{MONOPOLIST}$ is B's payoff under the scenario in which it imposes an AD duty on country A while C does not, and $W^{B}_{FREETRADE}$ is the payoff for B under the scenario where neither B nor C imposes an AD duty on A.

Finally, the upper critical value, $\theta^{B\star\star\star}$, is the value of θ^{B} for which country B is indifferent between initiating an AD case in the first and the second period of stage 1. Once again, the payoff of each action must be calculated in expected terms and for all the possible actions of country C. In particular, country C will initiate an AD case in period 1 with probability $\left(\overline{\theta}-\theta^{C\star\star\star}\right)/\left(\overline{\theta}-\underline{\theta}\right)$, in period 2 with probability $\left(\theta^{C\star\star\star}-\theta^{C\star\star}\right)/\left(\overline{\theta}-\underline{\theta}\right)$, while it will never initiate an AD case with probability $\left(\theta^{C\star}-\underline{\theta}\right)/\left(\overline{\theta}-\underline{\theta}\right)$. Also, with probability $\left(\theta^{C\star\star}-\theta^{C\star}\right)/\left(\overline{\theta}-\underline{\theta}\right)$, country C will initiate an AD case in period 2 if and only if country B does so in the first period. Thus, depending on country C's behavior and on its own chosen action, country B may find itself being a Cournot player, a Stackelberg leader, a Stackelberg

follower, or a monopolist. In other words, $\theta^{B\star\star\star}$ is implicitly defined by the following equation:

$$\begin{aligned}
&\frac{\overline{\theta}-\theta^{C\star\star\star}}{\overline{\theta}-\underline{\theta}}\left\{E^B\left[W^B_{COURNOT}\left(\theta^{B\star\star\star},\theta^C,E^B\left(\theta^C\right),\widetilde{E}^C\left(\theta^B\right)\right)|\theta^C\geq\theta^{C\star\star\star}\right]-\widetilde{K}\right\}\\
&+\frac{\theta^{C\star\star\star}-\theta^{C\star}}{\overline{\theta}-\underline{\theta}}\left\{E^B\left[W^B_{LEADER}\left(\theta^{B\star\star\star},\theta^C,E^B\left(\theta^C\right)\right)|\theta^{C\star}\leq\theta^C<\theta^{C\star\star\star}\right]-\widetilde{K}\right\}\\
&+\frac{\theta^{C\star}-\underline{\theta}}{\overline{\theta}-\underline{\theta}}\left[W^B_{MONOPOLIST}\left(\theta^{B\star\star\star}\right)-\widetilde{K}\right]\\
=&\frac{\overline{\theta}-\theta^{C\star\star\star}}{\overline{\theta}-\underline{\theta}}\left\{E^B\left[W^B_{FOLLOWER}\left(\theta^{B\star\star\star},\theta^C,\widetilde{E}^C\left(\theta^B\right)\right)|\theta^C\geq\theta^{C\star\star\star}\right]-\widetilde{K}\right\}\\
&+\frac{\theta^{C\star\star\star}-\theta^{C\star\star}}{\overline{\theta}-\underline{\theta}}\left\{E^B\left[W^B_{COURNOT}\left(\theta^{B\star\star\star},\theta^C,E^B\left(\theta^C\right),\widetilde{E}^C\left(\theta^B\right)\right)|\theta^{C\star\star}\leq\theta^C<\theta^{C\star\star\star}\right]-\widetilde{K}\right\}\\
&+\frac{\theta^{C\star\star}-\underline{\theta}}{\overline{\theta}-\underline{\theta}}\left[W^B_{MONOPOLIST}\left(\theta^{B\star\star\star}\right)-\widetilde{K}\right],
\end{aligned}\tag{8}$$

where W^B_{LEADER} is B's payoff when it emerges as a Stackelberg leader in the AD duty game with country C in stage 2.

Having characterized the equilibrium, the model is too complicated to allow for a closed-form solution. Thus, in the next subsection, we have to rely on a numerical solution to gain some further insights.

3.4 Numerical Solution

As we argued above, to derive an equilibrium of the desired class, we need to resort to numerical analysis.[11] In our benchmark scenario, we use the following parameter values: $\alpha=1$, $\widetilde{K}=0.01$, $\underline{\theta}=1$, and $\overline{\theta}=6$. Using these parameters as well as equations (6)–(8), and exploiting symmetry between countries B and C, we obtain the following equilibrium critical values: $\theta^{B\star\star\star}=\theta^{C\star\star\star}\equiv\theta^{\star\star\star}=5.09624$, $\theta^{B\star\star}=\theta^{C\star\star}\equiv\theta^{\star\star}=2.77845$, and $\theta^{B\star}=\theta^{C\star}\equiv\theta^{\star}=2.66092$. We also confirm numerically that it is optimal for countries B and C to behave as described by our equilibrium conditions (a)–(c).

To intuitively understand our equilibrium, let us focus, without loss of generality, on country B. If country C imposes an AD duty on country A, some of the latter's exports are diverted away from the former and towards country B (i.e., trade deflection takes place). This induces B to also impose an AD duty on A, incurring the cost $\widetilde{K}$, as long as its government is

[11] The numerical analysis was carried out using Mathematica (the code is available upon request).

sufficiently politically motivated, i.e., as long as θ^B exceeds the critical threshold $\theta^{B\star}$. Actually, if country B's government is characterized by a relatively high degree of political motivation, then it will choose to initiate an AD case against A independently of what country C does, in order to offer some trade protection to its domestic firm. This is the case for $\theta^B \geq \theta^{B\star\star}$.

Finally, if country B's political-economy parameter exceeds the critical threshold $\theta^{B\star\star\star}$, then country B will choose to initiate the AD case against country A in the first period of stage 1. In fact, this is true in equilibrium, even though our numerical analysis reveals that, in the AD duty game with country C, B's expected payoff when playing as a Stackelberg follower strictly exceeds the one when acting as a Stackelberg leader for all $\theta^B \in [1, 6]$. To understand then our finding, notice that in the game in question, if country B initiates the AD case against A in period 1 of stage 1, then it will most likely be a Stackelberg leader, whereas if it does so in period 2 of stage 1, it will more likely be a Cournot player rather than a Stackelberg follower (see equation (8)). Our numerical analysis does also reveal that for "large" θ^B, (i) B's expected payoff when acting as a Stackelberg leader strictly exceeds the Cournot one; and (ii) the difference between B's expected payoff under being a Stackelberg follower and the one under being a Stackelberg leader becomes "small." It then follows that if country B's government is characterized by a "very high" degree of political motivation, it will choose to initiate the AD case against A in period 1.

3.4.1 Comparative Statics

In order to better understand the forces at work in our model, we now engage in some comparative statics with respect to the AD-cost parameter $\widetilde{K}$. We first consider the case where we increase the cost by 5% relative to our benchmark scenario (i.e., we set $\widetilde{K} = 0.0105$). Compared with our benchmark equilibrium, the lower and the middle critical values for countries B and C are higher, whereas the upper one decreases. In particular, in this "high-cost" equilibrium, we find that $\theta^{\star\star\star} = 4.95938$, $\theta^{\star\star} = 2.92375$, and $\theta^{\star} = 2.79453$.

Intuitively, as the cost of imposing an AD duty increases, both countries B and C are less inclined to initiate an AD case against A, raising both $\theta^{\star}$ and $\theta^{\star\star}$. However, the intuition underlying the finding that $\theta^{\star\star\star}$ is lower in the "high-cost" equilibrium than in the benchmark one is more involved, as we have two offsetting forces at play. In particular, our numerical

analysis reveals that as compared with our benchmark equilibrium, in the "high-cost" scenario (i) the difference between the expected Stackelberg leader and Cournot payoffs increases for "large" θ^k ($k \in \{B, C\}$), inducing the countries to wait until period 2 of stage 1 in order to initiate their AD case against A; but at the same time, (ii) the difference between the expected Stackelberg follower and Stackelberg leader payoffs decreases for "large" θ^k, inducing the countries to initiate their AD activity against A in the first period of stage 1. Our numerical analysis also shows that the latter force is relatively stronger, giving rise to our finding.

We next decrease $\widetilde{K}$ by 5% relative to our benchmark scenario (i.e., we set $\widetilde{K} = 0.0095$). The resulting equilibrium critical values for B and C are as follows: $\theta^{\star\star\star} = 5.24502$, $\theta^{\star\star} = 2.62426$, and $\theta^{\star} = 2.52575$. Notice that in comparison with our benchmark equilibrium, in the "low-cost" equilibrium, $\theta^{\star\star}$ and $\theta^{\star}$ are both lower, but $\theta^{\star\star\star}$ is higher. These results mirror the conclusions reached for the "high-cost" scenario, and the intuition underlying these findings is analogous to the one analyzed above.

4 Empirical Analysis

The first objective of our empirical analysis is to provide a comprehensive overview of the occurrence of AD echoing in the world from 1980 until 2005. In this way, we dramatically extend the work of Maur (1998) who looked only at the AD actions of Canada, the EU, and the US over the period 1980–1996. The second objective is to conduct an econometric analysis of the determinants of AD echoing motivated by the conclusions of our theoretical model. To this end, we focus on the 15 countries whose total caseload makes them active and regular users of AD, as explained in detail below. Overall, this subset of countries accounts for over 90% of the total number of worldwide AD petitions.

4.1 Data

Data on the worldwide use of AD come mainly from Bown (2007) and are complemented with data from Moore and Zanardi (2009) for some years and countries (see Table A in the appendix for details on geographical and time coverage). While the sample does not include all known cases of AD in the world, it is fair to say that it covers almost all AD cases with

only small countries (in terms of AD use) excluded.[12] Missing data in both sources have been added, where possible, by searching the publications of investigating authorities and of the WTO (i.e., semi-annual reports of the Committee on Antidumping Practices, and Trade Policy Reviews).

For each petition recorded in the dataset, we have information about all the important dates and decisions of the AD investigation process.[13] The product under investigation is described in detail and classified according to the HS classification (usually with at least 6 digits). In total, the dataset includes 5,415 petitions initiated by 47 countries. A large majority of these investigations reached the final stage, and 2,790 of all petitions (i.e., 51.5%) led to the introduction of AD measures, although there is a lot of country-level heterogeneity in terms of success rates and forms of measures. Table 2 lists all the AD active countries, both in terms of initiations and actual implementation of AD measures.[14] The US and the EU top both lists but, as already highlighted in the literature, many developing countries are heavy users of AD protection as it appears in Table 2.

In the econometric analysis, we control for the value and growth of sectoral trade between a trading country pair. Trade values are extracted from the UN COMTRADE dataset and are unfortunately available only for a subset of the years in the sample period.

4.2 Overview of Antidumping Echoing

The definition of AD echoing used by Maur (1998) is subjective and, to some extent, data driven. In particular, he identified echoing by considering product classification, the identity of importing and exporting firms involved in an investigation, references to previous related cases found in official publications of the investigating authorities, and imposing at the same time that a subsequent investigation must take place while previous measures are still in force. For the purposes of this paper, we define AD echoing as the situation where a *given product* (identified by the general description and the 6-digit HS codes supplied by the investigating

[12] Excluded countries (e.g., Russia) were not members of the WTO during the sample period and their AD activity cannot be traced systematically over the years.

[13] An AD case refers to a complaint filed by a domestic industry for a specific good imported from possibly various countries. Administratively, a petition is initiated for each exporting country so that a case may include several petitions (one per exporting country).

[14] Countries included in the econometric analysis are in italics.

authorities[15]) exported by a *given country* is *simultaneously* subject to AD measures in two or more importing countries and the imposition of such measures took place *within* 5 years from each other. We can also define cases of *simultaneous imposition of AD measures* (i.e., occurring in the same period). In this case, the above definition is modified to consider measures imposed within 6 months from each other.[16] Our definition differs from Maur's (1998) in some important aspects because of theoretical and practical reasons. In line with our theoretical model, we focus only on AD measures and not simply on the initiation of AD petitions. Moreover, we restrict our attention to measures that are echoed within 5 years, because actions further away from each other are most likely not the result of political pressures that are the focus of our theoretical model. Finally, on practical grounds, we only rely on HS codes and product descriptions to characterize goods subject to AD echoing since details of exporters and import-competing producers are not readily available for the 47 countries included in the dataset. The number of countries and cases makes it also impossible to even attempt to read the official publications of the investigating authorities.

Considering our benchmark definition of AD echoing, Table 1 reports the 235 echoing cases identified in our dataset (sorted by HS code).[17] An echoing case is defined as the ensemble of AD measures a targeted country faces on the same product from several importers, where each new measure comes into effect within 5 years from the previous one.[18] For example, the first row of Table 1 shows that the US imposed AD measures on garlic from China in November 1994, and Canada followed with measures in March 1997. However, polyvinyl chloride (HS code 390410) from the US has been subject to AD measures in 11 countries (the maximum in the sample), but still counts as one echoing case. In total, 573 petitions are involved in 235 echoing cases, representing 20.5% of all AD petitions in our sample that were concluded with the imposition of measures (i.e., 2,790 measures out of 5,415 petitions filed). The "length" of this list makes clear that echoing is a much more common phenomenon than originally highlighted by Maur (1998), and is certainly not relevant only for developed countries.

[15] Although information is sometimes available at the 8-digit level, such codes are not comparable across countries.

[16] Notice that we inherently face right censoring since AD measures in force for less than 5 years at the end of our sample period may be echoed by subsequent measures, which are though not observable.

[17] If we were to impose a 3-year maximum lag between AD measures, we would identify 195 echoing cases.

[18] Notice that this definition implies that measures introduced more than 5 years apart from each other and possibly not simultaneously in force can be part of the same echoing case.

Figure 3 reports the distribution of the time lag between impositions of echoed AD measures. The average lag between two subsequent impositions is exactly 21 months (630 days), but the median is much lower (16 months or 481 days), indicating the presence of a few outliers (as shown in Figure 3). Based on the 6-month window discussed above, 21% of the cases would qualify as simultaneous impositions of AD measures.

Trying to analyze the long list reported in Table 1, Table 3 presents an overview of targeted countries, importing countries, and industrial sectors involved in AD echoing. China is the most frequently targeted exporting country (25.0%), with South Korea a distant second (12.7%) out of a total of 43 countries. The list of AD imposing countries is shorter (31 countries) but it does feature developing countries with significant shares (e.g., Argentina, Mexico, Turkey). Still, the EU and the US are at the top of the list, being responsible for 16% and 15% of the measures, respectively. And the steel industry (i.e., HS codes 72 and 73) clearly dominates among industrial sectors with almost 40% of the total, followed by the chemical industry (i.e., HS codes 28–38) with a 15% share.

Overall, the picture emerging from Table 3 is in line with general descriptions of the AD phenomenon in terms of its worldwide use, suggesting that echoing is a pervasive aspect of AD that is not confined to specific (importing and exporting) countries or products. As is the case for AD in general, the statistics presented above with regard to the countries introducing AD measures are sensitive to the chosen sample period, since the number of countries using this policy instrument has grown dramatically in the last two decades. In particular, the share of echoing measures from the EU and the US has shrunk substantially with new users such as Argentina, Brazil, China, India, and Turkey becoming ever more important. For example, traditional users (i.e., Australia, Canada, the EU, New Zealand, and the US) account for 66.7% of the measures involved in echoing until 1995, but only for 37.9% for the years from 1996 until the end of the sample. Instead, China introduced an AD law only in 1997 and is responsible for more AD measures involved in echoing than Australia in this recent subsample.

This comprehensive overview of AD echoing illustrates the relevance of the phenomenon: it is much more widespread than originally reported by Maur (1998), and is more generalized than the "product overlap" observed by Bown (2009) in various AD petitions filed during the recent economic crisis.

4.3 Econometric Analysis

Having documented the extent of AD echoing with descriptive statistics, we now turn to an econometric analysis to shed some light on its determinants. In the spirit of our theoretical model, we would expect echoing to be more likely to occur when the government of the importing country cares enough, but not too much, about its import-competing industries. In fact, if the weight attached by the government to an industry is very high, it will introduce AD measures irrespective of the AD actions targeting the same product by other importing countries.

The econometric analysis is based on the countries that have made major and systematic use of AD during our sample period. Based on Table 2, which reports summary statistics on initiations and impositions of AD measures, we select the 5 traditional users (i.e., Australia, Canada, the EU, New Zealand, and the US), and the 10 new users that have been active users of AD measures: Argentina, Brazil, China, India, Mexico, Peru, South Africa, South Korea, Taiwan, and Turkey. These countries filed a total of 4,996 petitions, representing 92.3% of worldwide recorded petitions, that led to the imposition of 2,685 measures (i.e., these countries have a slightly higher propensity to impose measures than the whole set of countries—53.7% versus 51.5%). In terms of echoing cases, 469 out of 2,685 petitions with final measures are involved in echoing (i.e., 17.5%) for a total of 203 cases (i.e., these countries account for over 86% of the worldwide echoing cases reported in Table 1).

The unit of observation for the analysis is the bilateral-sectoral level over time between the 15 importing countries identified as major AD users above and 39 exporting countries (i.e., the same 14 importing countries and the 25 countries constituting the EU).[19] Our dependent variable, $y_{i,j,k,t}$, takes a value of 1 (and 0 otherwise) if the importing country i introduces an AD measure against country j in the 4-digit HS sector k in year t. Notice that in the previous section, we defined echoing considering the 6-digit HS industrial classification, while the econometric analysis is based on a more aggregate industry definition. This change is motivated by the fact that the occurrence of AD actions is overall a rare event among all the industrial sectors of an economy (i.e., the dependent variable is equal to 1 in slightly more than 0.02% of all the observations), and this issue would become even more extreme at a more

[19] We exclude intra-EU observations and EU as an exporter since we include its individual member states.

disaggregated level. Moreover, availability of trade data at the 6-digit HS level is even more limited and would include a much larger occurrence of zero trade flows.

We then estimate the following linear probability model:

$$y_{i,j,k,t} = \alpha_{i\times j\times t} + \eta_s + \beta_1 \Theta_{i,s} + \beta_2 X_{j,g,k,t/t-4} + \beta_3 \Theta_{i,s} \cdot X_{j,g,k,t/t-4} + \gamma Z_{i,j,k,t-2} + \varepsilon_{i,j,k,t} \quad (9)$$

where $\alpha_{i\times j\times t}$ represents three-way fixed effects (importing country $\times$ exporting country $\times$ year), η_s is a set of 2-digit-HS-sector fixed effects, $\Theta_{i,s}$ is a set of 2-digit-HS-sector- and country-specific variables capturing the political-economy channel analyzed in our theoretical model, $X_{j,g,k,t/t-4}$ indicates whether a group of countries g has introduced final AD measures against country j in sector k within the 5-year period between t and $t-4$, $Z_{i,j,k,t-2}$ includes control variables, and $\varepsilon_{i,j,k,t}$ is the error term. β_1, β_2, β_3, and γ are the coefficients to be estimated.[20]

In order to proxy for the political-economy weight in the government objective function, we rely on the actual country- and sector-specific use of AD measures. In particular, we count the total number of AD measures introduced by each importing country in each of its 2-digit HS sector in the period 1999–2003. A 5-year window should be long enough for the preferences of the policymaker to be revealed. The choice of the most recent period common to all importers guarantees that we are excluding the first few years after the introduction of an AD law when the AD system is not yet well established.[21] Denoting this variable $\theta_{i,s}$, our theoretical model suggests that the AD measures introduced by other countries affect an importing country's decision to introduce an AD measure only for intermediate values of $\theta_{i,s}$. To allow for such a nonlinear effect, we introduce both $\theta_{i,s}$ and its squared term. In other words, we introduce $\Theta_{i,s} = \{\theta_{i,s}, \theta_{i,s}^2\}$. Notice that our proxy for the political-economy channel is country- and (2-digit-HS-) sector-specific, thus allowing us to include the set of 2-digit-HS-sector fixed effects (η_s) and importer$\times$exporter$\times$year ($\alpha_{i\times j\times t}$) fixed effects.

The political-economy proxy $\Theta_{i,s}$ is interacted with an indicator of AD actions by other countries. In particular, $X_{j,g,k,t/t-4}$ is equal to 1 (and 0 otherwise) if at least one AD measure

[20] Considering the large number of fixed effects, a probit or logit estimator would suffer from the incidental parameter problem.

[21] Among the new users included in the analysis, China is the last one to have introduced an AD law (in 1997). In the robustness subsection, we specifically address the case of China in order to verify that the results are robust to the choice of a more recent 5-year period (so as to more accurately characterize the political-economy motivations of its policymakers).

in the same 4-digit HS sector k has been introduced within the period between t and $t-4$ by the group of countries g. And considering the systematically different AD experience between traditional and new users, we distinguish whether the AD measure has been introduced by the former or by the latter (i.e., g indicates whether the group in question is the set of traditional or new users).[22] Our theoretical model would suggest that the linear term of the interaction term should have a positive impact on the likelihood of country i introducing an AD measure against country j in sector k, while the squared one should present a negative sign. Notice that the indicator variable $X_{j,g,k,t/t-4}$ in itself can capture other channels, not directly related to political economy motivations, whereby the actions of one importing country affect protectionist measures in other countries (e.g., conveying information on dumping behavior of exporters). Thus, it is important to emphasize that the key regressors for our analysis are the interaction terms between past use of AD measures and the political-economy proxy (as motivated by our theoretical model).

The richness of our dataset allows us to use fixed effects to control for any time-bilateral variation between the trading partners since the unit of analysis is the 4-digit HS sectoral level with the proxies for the political-economy channel being defined at the 2-digit HS level. In this way, we account for any bilateral and time-varying determinants of AD measures, including the role of any macro-level effects.[23] However, the benefit of controlling for any bilateral and time-varying effects, and thus reducing the possibility of omitted variables bias, comes at the cost of not being able to confirm previous results from the literature on macro channels.

The matrix $Z_{i,j,k,t-2}$ includes trade data at the disaggregated 4-digit HS level. In particular, the amount of imports from an exporter (as a share of total imports of a given product) is known to be a crucial determinant of AD measures. In fact, the WTO Antidumping Agreement clarifies that AD cases should be rejected when imports from a source country represent less than 3% of total imports of that good. Furthermore, the larger the import market share, the more likely for an industry to file an AD petition and for the investigating authority to

[22] The AD measures introduced by an importing country are not included in the construction of $X_{j,g,k,t/t-4}$ used for that country. For example, the actions of the US are not considered in $X_{j,g,k,t/t-4}$ when g refers to traditional users and the US is the importing country.

[23] Various studies (see Bown and Crowley, 2013, and references therein) have highlighted the responsiveness of AD to GDP growth and exchange rate fluctuations, as well as the role of other macro variables (e.g., inflation, current account; see Moore and Zanardi, 2011).

impose measures because of the role of that exporting country. Moreover, the growth rate of imports may be a relevant determinant of AD measures since it can capture the extent of trade diversion induced by AD measures in other countries. Considering that an investigation on average takes one year to reach its final stage, and that the authorities consider the trade performance in the year before the AD petition is filed, these regressors are lagged by two periods. Unfortunately, the scarce data availability for the 1980s forces us to drop a large number of observations whenever these regressors are included in the estimations.

4.3.1 Results

Since the AD experience of traditional and new users is dramatically different and there is evidence (e.g., Vandenbussche and Zanardi, 2010) that the intensity of current AD use has important implications for further AD use, we present our results splitting the sample between traditional and new users.

Table 4 contains our benchmark results. The first two columns focus on the experience of traditional users, while the last two consider the new users of AD. Furthermore, the difference between the first and second specification of each sample is due to the inclusion of the trade variables, which forces us to drop a large number of observations because of data availability. In light of the results of our theoretical model, we should uncover a nonlinear effect of the political-economy weight when interacted with the use of AD measures by other countries (on the same product and exporting country). This is what we see in all specifications with respect to the duties introduced by new users.[24] In both groups of countries, the likelihood of an importing country introducing a new AD measure is higher whenever a new user has introduced a similar measure in the same 4-digit HS sector, but is decreasing for high levels of the variable $\theta_{i,s}$, which is proxying for the political-economy motivation of the government. While the results on the reaction to the AD actions of new users is common between the two groups of countries, the results in columns (3) and (4) show that new users also respond to past actions of traditional users, while traditional users do not.

As for the other regressors, the proxy variable $\theta_{i,s}$ is statistically significant and, as expected, positive in all specifications, as sectors with higher values of $\theta_{i,s}$ are more likely to see

[24] In column (4), the squared term has a p-value of 0.11.

the introduction of AD measures. For new users, also the squared term is significant, denoting a nonlinear effect (independently of any AD measure).

Notice that the qualitative results are not affected by introducing trade controls (in the second and fourth column). Notwithstanding the large drop in observations because of data availability, the qualitative results on the role of the political-economy channel are quite similar (i.e., the only difference is that the interaction term between measures by new users and $\theta_{i,s}^2$ is not significant at the conventional level for the sample of new users; it has a p-value of 0.11). As for the trade variables, the lagged trade share, as expected, presents a significant and positive effect in all four specifications, whereas lagged trade growth is never significant.

These results are broadly consistent with our theoretical model, but they highlight an important difference between traditional and new users of AD. In particular, traditional users only respond to the actions of new users, while the AD measures of both groups of countries are statistically significant determinants of new AD measures by new-user countries.

4.3.2 Robustness Checks

The results in Table 4 show that AD measures from other users and political-economy motivations jointly affect the decision to impose new AD measures in a nonlinear way, as suggested by the theoretical model presented in Section 3. In this subsection, we discuss a series of robustness checks to demonstrate that the results presented so far are qualitatively unchanged when using different samples or when calculating the proxy variable $\theta_{i,s}$ differently.

When adding trade controls, we lose a lot of observations because of lack of such data for some years (mostly in the 1980s). However, we may also want to exclude observations for sectors in which there is no trade. In such a case, AD measures cannot be introduced by definition. The first two columns of Table 5 reproduce the same specifications for traditional and new users as in Table 4 while dropping from the sample observations for which the trade share is equal to zero at time t, or $t-1$, or $t-2$.[25] As the table makes clear, there is no qualitative change to the results presented in the previous section. Similarly, the results are robust to excluding those observations that are outliers in terms of trade growth, defined as

[25] The results are equally invariant to the exclusion of those observations for which the trade share is jointly equal to zero in each of these three years.

the top one percentile of the distribution (i.e., above 1,663% and 1,860% annual growth for traditional and new users, respectively). The results for such reduced samples are reported in the last two columns of Table 5.

In the next set of robustness checks, we eliminate the weakest AD users among the traditional and new users. The countries included in these groups are either based on historical grounds (for traditional users) or because of the summary statistics discussed in Section 4 (for new users). Still, the descriptive statistics reported in Table 2 indicate that not all selected users are equally intensive in their application of AD measures. Thus, Table 6 reports the results when excluding New Zealand from the set of traditional users and Peru, South Korea, and Taiwan from the group of new users. As it can be seen, the results for this smaller set of users are qualitatively identical although the interaction terms between measures of new users and the squared term of the political-economy proxy are only significant at the 8% and 15% level in the last two columns (i.e., for new users), respectively.[26]

As a final robustness check, Table 7 reports the results of estimations using different versions of $\theta_{i,s}$ as a proxy of political-economy motivations. Traditional users of AD have been intensive users of this trade instrument for a long time. Thus, we now construct $\theta_{i,s}$ using the AD measures that they imposed over the 5-year period 1991–1995. The results when using this version of the proxy are shown in the first two columns of Table 7. In general, our previous results are confirmed. However, it also appears that political-economy considerations are more prominent when proxied by the caseload of this earlier period. In fact, the squared term of $\theta_{i,s}$ is positive and highly significant while the linear term is not.

Finally, in the last two columns of Table 7, we use the most recent available period to calculate $\theta_{i,s}$ for new users.[27] This exercise is particularly relevant for China since it is the last country in our sample to have introduced an AD law (in 1997). Thus, it may be that the government's preferences in supporting its industries have not been completely revealed by the period 1999–2003, which is used in the benchmark analysis (although China started using this instrument soon after introducing the AD law). The results when using this alternative formulation are reported in the last two columns of Table 7 and they are in line with our

[26] The results for new users would also be unchanged if we were to drop only the weakest AD user, Taiwan.

[27] In particular, we use the periods 2001–2005 for China and Taiwan, 1999–2003 for Brazil and Mexico, and 2000–2004 for the remaining countries.

previous findings.[28]

5 Conclusions

This paper has documented the empirical relevance of AD echoing, whereby a given product exported by a given country is subject to multiple AD measures from different (and potentially several) importing countries at the same time. Considering the worldwide AD caseload over the period 1980–2005, the first result of the paper is to show that echoing is a widespread practice that involves developed and developing countries and a variety of sectors. Thus, it is a much more common and pervasive phenomenon than originally highlighted by Maur (1998) for the 1980s and early 1990s in the case of Canada, the EU, and the US.

Considering its empirical relevance, we have presented a dynamic game in which two competing importers can choose to impose an AD duty on a third exporting country in one of two periods, if at all, so that we theoretically explore the determinants of AD echoing. Consistently with the literature on trade policy in general and on AD in particular, we assume that governments are politically motivated, attaching an extra weight to the profits of their domestic import-competing industries in their objective function. The results show that echoing is much more likely to occur when the political-economy channel is strong, but not "too" strong. In fact, a government would introduce AD measures independently of the other country's actions if it cares a lot about its domestic industry. This conclusion is confirmed when considering the AD experience of the 15 most active users of AD. Although there are differences between traditional and new users of AD, the econometric results demonstrate the nonlinear effect of the interplay between governments' political-economy motivations and the AD measures introduced by other countries on the same products and against the same exporting countries.

In conclusion, this paper highlights yet another peculiar feature of the AD system and the strategic behaviors it can give rise to. In particular, the political-economy-driven AD actions of different countries are interdependent and cannot be fully understood when each importing country is analyzed in isolation.

[28] The results are also qualitative similar if we change the period for the calculation of $\theta_{i,s}$ only for China.

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Table 1: List of antidumping echoing cases (based on measures)

Product	(HS6)	Target country	AD measures by			AD measures by			AD measures by		AD measures by
Fresh garlic	(070320)	China	USA	11/94	→	Canada	03/97				
Mushrooms	(200310)	China	Brazil	01/98	→	USA	02/99				
Pineapples	(200820)	Thailand	Australia	01/92	→	Brazil	06/94				
Peaches	(200870)	Greece	New Zealand	03/98	→	Brazil	04/02				
Portland cement	(252329)	Belarus	Lithuania	07/01	→	Latvia	07/02				
		Indonesia	Trinidad Tobago	01/03	→	Jamaica	07/04				
		Mexico	Guatemala	01/97	→	Ecuador	01/00	→	Brazil	07/00	
		Thailand	Trinidad Tobago	10/99	→	Jamaica	04/01				
Fluorspar	(252922)	China	European Union	03/94	↔	Mexico	05/94				
Tungsten ores and concentrates	(261100)	China	European Union	09/90	→	USA	11/91				
Coke and semicoke of coal	(270400)	China	India	08/98	→	European Union	12/00	→	USA	09/01	
Carbon	(280300)	India	South Africa	09/99	→	Indonesia	09/04				
		South Korea	South Africa	09/99	→	Indonesia	09/04				
Hydrogen	(280469)	Brazil	USA	07/91	→	European Union	08/92				
		Russia	USA	03/03	→	European Union	12/03				
Phosphoric acid	(280920)	Belgium	USA	08/87	→	Colombia	05/92				
		China	South Korea	02/93	→	Colombia	10/96	→	India	08/01	
Zinc oxide	(281700)	China	European Union	03/02	↔	India	03/02				
Artificial corundum	(281810)	Brazil	Mexico	04/89	→	European Union	07/91				
Titanium oxides	(282300)	China	India	03/04	→	South Korea	03/05				
Sodium sulfites	(283210)	China	India	11/01	→	Australia	06/02				
Peroxosulfates	(283340)	China	European Union	12/95	→	USA	07/97				
Polyphosphates	(283531)	China	Philippines	12/98	→	India	02/03				
Barium carbonate	(283660)	China	India	03/00	→	USA	10/03	→	European Union	07/05	
Dichloromethane	(290312)	European Union	China	04/02	→	India	08/03				
		South Korea	China	04/02	→	India	08/04				
D-Glucitol	(290544)	France	Mexico	09/90	↔	Australia	10/90				
Phenol	(290711)	European Union	Brazil	10/02	↔	India	02/03				
		USA	Brazil	10/02	→	China	02/04				
Cresols	(290712)	China	India	08/03	↔	European Union	09/03				
Monobutyl ethers	(290943)	USA	Mexico	06/03	→	Brazil	10/04				
Citric acid	(291814)	China	Turkey	05/95	→	Indonesia	03/99				
Diethanolamine	(292212)	USA	Brazil	09/93	↔	European Union	02/94	→	South Korea	07/96	
Choline	(292310)	China	India	11/01	→	South Korea	12/04				
Isocyanates	(292910)	USA	Argentina	12/02	→	China	11/03				
Other organo-inorganic compounds	(293100)	China	European Union	02/98	→	Brazil	02/03				
Furfuryl alcohol	(293213)	China	European Union	10/03	→	USA	08/04				
Coumarin	(293221)	China	USA	02/95	→	European Union	03/96				
Heterocyclic compounds	(293369)	China	Mexico	12/02	→	USA	06/05	↔	European Union	10/05	

Product	(HS6)	Target country	AD measures by				AD measures by				AD measures by				AD measures by			
6-Hexanelactam	(293371)	European Union	China	06/03	→	India	09/04											
		Japan	China	06/03	→	India	09/04											
Urea	(310210)	German Dem. Re	India	08/03	↔	European Union	09/03											
		Romania	USA	07/87	→	European Union	02/89											
		USSR	USA	07/87	↔	European Union	11/87											
Ammonium nitrate	(310230)	Russia	USA	06/00	→	Australia	05/01	→	Brazil	11/02								
Herbicides	(380830)	China	European Union	02/98	→	Australia	02/02	→	Brazil	02/03	↔	Australia	03/03					
Polyethylene	(390120)	South Korea	Australia	08/92	→	Taiwan	05/94											
Polypropylene	(390210)	South Korea	Australia	08/93	→	Taiwan	05/94											
Polymers of styrene	(390319)	South Korea	India	09/98	↔	Australia	12/98	→	China	12/01								
	(390319)	USA	Venezuela	03/94	→	Mexico	11/94											
Poly(vinyl chloride)	(390410)	France	Australia	09/92	→	South Africa	03/97											
		Hungary	Australia	03/00	→	Turkey	02/03											
		Israel	Australia	12/02	↔	Turkey	02/03											
		South Korea	Australia	03/00	→	South Africa	06/01	→	China	09/03								
		Mexico	Australia	12/91	→	Brazil	12/92	→	Argentina	12/93								
		USA	Mexico	06/91	→	Australia	12/91	→	Brazil	12/92	→	Argentina	12/93	→				
			South Africa	03/97	→	Israel	03/99	↔	Colombia	05/99	→	Argentina	04/00	↔				
			Venezuela	07/00	→	Turkey	02/03	→	China	09/03								
Polytetrafluoroethylene	(390461)	China	European Union	08/05	↔	India	10/05											
Poly(vinyl alcohol)	(390530)	Japan	USA	05/96	→	South Korea	04/98											
Other polyethers	(390720)	South Korea	Australia	04/02	→	India	11/04											
		Singapore	India	08/03	↔	European Union	09/03											
		USA	Australia	04/02	↔	India	09/02	↔	Argentina	11/02								
Poly(ethylene terephthalate)	(390760)	China	European Union	08/04	→	Turkey	01/06											
		South Korea	European Union	11/00	→	China	02/03	→	Turkey	01/06								
Floor coverings	(391810)	Thailand	Malaysia	03/96	→	Philippines	02/01											
Other plates, sheets, film, foil and strip	(392062)	India	European Union	08/01	→	USA	07/02											
		South Korea	China	08/00	→	European Union	08/01											
Tableware and kitchenware	(392410)	China	Australia	05/93	→	USA	02/97											
Styrene-butadiene rubber	(400219)	South Korea	India	06/99	→	China	09/03											
		Taiwan	India	06/99	→	European Union	09/00											
Pneumatic tires (cars)	(401110)	China	Peru	05/02	↔	Egypt	05/02	→	Turkey	08/05								
		South Korea	South Africa	09/98	→	Egypt	10/99											
Pneumatic tires (bicycles)	(401150)	China	Argentina	03/03	↔	Turkey	04/03											
		India	Argentina	09/95	↔	Mexico	12/95	→	Brazil	01/98								
		India	Turkey	04/03	↔	Argentina	05/03											
		Thailand	Argentina	03/03	↔	Turkey	04/03											
Self-copy paper	(480920)	European Union	South Africa	07/94	→	Malaysia	04/97	→	South Korea	03/98								
Paper	(481011)	Japan	Australia	05/98	→	Taiwan	07/00	→	China	08/03								

Product	(HS6)	Target country	AD measures by				AD measures by				AD measures by				AD measures by			
		South Korea	China	08/03	→	Indonesia	11/04											
Albums for samples or for collections	(482050)	Hong Kong	Canada	04/85	→	USA	12/85	→	European Union	05/90								
		South Korea	Canada	04/85	→	USA	12/85	→	European Union	05/90								
Textured yarn of polyesters	(540233)	India	Turkey	06/00	→	European Union	11/02											
		South Korea	Turkey	06/00	→	Mexico	06/01											
		Taiwan	Turkey	06/00	→	Mexico	06/01											
Woven fabrics of synthetic yarn	(540752)	China	Turkey	02/02	→	European Union	09/05											
		South Korea	Argentina	06/00	→	Turkey	02/02	→	Argentina	08/05								
		Malaysia	Turkey	02/02	→	Argentina	08/05											
		Thailand	Turkey	02/02	→	Argentina	08/05											
Synthetic filament tow	(550130)	Belarus	Turkey	04/94	→	European Union	07/96	→	Poland	08/00								
Synthetic staple fibers	(550320)	Indonesia	India	08/03	↔	European Union	09/03											
		India	European Union	12/00	→	Turkey	07/03											
		South Korea	Turkey	06/92	→	European Union	01/93	→	Mexico	08/93								
		South Korea	Turkey	03/00	↔	USA	05/00	→	European Union	12/00	→	Argentina	11/02	↔				
			India	12/02	↔	China	01/03											
		Romania	European Union	12/88	→	Turkey	06/92											
		Thailand	European Union	07/00	→	India	12/02	→	Turkey	07/03								
		Taiwan	European Union	12/88	→	Turkey	11/90											
		Taiwan	USA	05/00	→	India	12/02	→	Turkey	07/03								
Synthetic staple fibers	(550330)	Portugal	South Africa	12/97	→	India	01/99											
Twine, cordage, ropes and cables	(560749)	India	European Union	06/98	→	Trinidad Tobago	03/01											
Blankets	(630140)	China	South Africa	06/99	→	Turkey	12/02											
Other bed linen	(630221)	Pakistan	European Union	11/97	→	South Africa	05/01	→	European Union	03/04								
Sports footwear	(640219)	China	Peru	03/97	→	Venezuela	04/00	→	Canada	12/00								
Articles of plaster	(680911)	Thailand	New Zealand	09/00	→	South Africa	02/04											
Ceramic tableware	(691200)	China	Peru	10/04	↔	Colombia	11/04											
Float glass	(700529)	Indonesia	Philippines	12/00	→	Australia	06/01											
		Singapore	South Africa	11/93	→	Australia	07/94											
		Thailand	Australia	08/93	↔	South Africa	11/93											
Glass fibres	(701910)	Taiwan	South Korea	04/94	↔	Australia	05/94											
Fresh garlic	(070320)	China	USA	11/94	→	Canada	03/97											
Ferromanganese	(720211)	China	Indonesia	03/99	→	Mexico	06/03											
Ferrosilicon	(720221)	China	USA	03/93	→	European Union	03/94											
Ferrosilicon manganese	(720230)	Brazil	USA	12/94	→	European Union	10/95											
		China	Japan	01/93	→	USA	12/94	→	European Union	03/98	↔	South Korea	04/98					
		Ukraine	USA	12/94	→	European Union	10/95											
Ferroalloys	(720249)	Kazakhstan	European Union	09/93	→	Brazil	04/94	→	India	12/96								
		Macedonia	Brazil	04/96	→	India	09/99											
		Russia	European Union	09/93	→	Brazil	04/94	→	India	12/96								

Product	(HS6)	Target country	AD measures by			AD measures by			AD measures by			AD measures by		
		Ukraine	European Union	09/93	→	Brazil	04/94							
Semifinished products of iron or steel	(720711)	Russia	Colombia	09/99	→	Philippines	11/00	→	Turkey	10/01				
		Ukraine	Colombia	09/99	→	Turkey	10/01							
Flat-rolled products of iron or steel	(720810)	Brazil	Argentina	12/99	→	USA	03/02							
		China	Indonesia	09/97	→	USA	11/01							
		India	Indonesia	09/97	→	European Union	02/00	→	USA	12/01				
		Kazakhstan	Venezuela	06/99	→	USA	11/01	↔	Argentina	04/02				
		Romania	USA	11/01	↔	Argentina	04/02							
		Russia	Mexico	06/96	→	Indonesia	09/97	→	Venezuela	06/99	↔	USA	07/99	↔
			Argentina	12/99										
		Slovak Republic	Argentina	04/02	→	European Union	02/03							
		Taiwan	European Union	02/00	→	USA	11/01							
		Ukraine	Indonesia	09/97	→	Venezuela	06/99	↔	Argentina	12/99	↔	Mexico	03/00	→
			USA	11/01										
		South Africa	European Union	02/00	→	USA	09/01	→	Argentina	04/02				
Flat-rolled products of iron or steel	(720825)	Russia	Canada	07/99	↔	Peru	12/99							
		Ukraine	Peru	12/99	→	Canada	08/01							
Flat-rolled products of iron or steel	(720851)	China	Canada	10/97	→	European Union	08/00	→	Australia	04/03				
		Indonesia	Canada	06/00	→	Australia	04/03							
		India	Canada	06/00	↔	European Union	08/00							
		Romania	European Union	08/00	→	Canada	01/04							
		Russia	Canada	10/97	→	Mexico	11/98	→	Peru	12/99	→	Colombia	11/00	→
			Peru	05/03										
		Ukraine	Canada	05/94	→	Mexico	11/98	→	Peru	12/99	→	Canada	06/00	↔
			Colombia	11/00										
		South Africa	Canada	10/97	↔	USA	11/97							
Flat-rolled products of iron or steel	(720915)	Kazakhstan	Argentina	01/03	→	China	09/03							
		South Korea	Argentina	01/03	→	China	09/03							
		Russia	Canada	08/99	→	Argentina	03/01	→	China	09/03				
		Ukraine	Argentina	01/03	→	China	09/03							
Flat-rolled products of iron or steel	(720916)	Kazakhstan	Colombia	03/99	↔	Mexico	06/99	↔	Venezuela	08/99	→	Thailand	01/03	
		Russia	Colombia	03/99	↔	Mexico	06/99	↔	Venezuela	08/99	↔	Philippines	12/99	→
			Thailand	01/03										
		Ukraine	Colombia	03/99	↔	Venezuela	08/99							
Flat-rolled products of iron or steel	(721012)	Japan	Indonesia	04/99	→	USA	08/00							
Concrete reinforcing bars and rods	(721310)	Turkey	USA	04/97	→	Indonesia	03/98	→	Canada	01/00				
Other bars and rods of iron or steel	(721420)	Indonesia	Canada	06/01	↔	USA	07/01							
		Japan	Venezuela	05/00	→	Canada	06/01							
		South Korea	Canada	01/00	→	USA	07/01							
		Latvia	Canada	06/01	↔	USA	07/01							

Product	(HS6)	Target country	AD measures by				AD measures by				AD measures by				AD measures by			
		Moldova	Canada	06/01	↔	USA	07/01											
		Poland	Canada	06/01	↔	USA	07/01											
		Turkey	USA	04/97	→	Canada	01/00											
		Ukraine	Canada	06/01	↔	USA	07/01											
H sections (iron or nonalloy steel)	(721633)	South Korea	Thailand	04/98	→	Taiwan	12/98											
		Poland	Thailand	05/97	→	Taiwan	12/98											
		Russia	South Korea	04/97	→	Taiwan	12/98											
Flat-rolled products of stainless steel	(721931)	Japan	China	12/00	→	India	12/02											
Bars and rods of stainless steel	(722100)	Japan	Taiwan	04/96	→	USA	09/98											
Other bars and rods of stainless steel	(722211)	Germany	Canada	09/98	→	USA	03/02											
		France	Canada	09/98	→	USA	03/02											
		United Kingdom	Canada	09/98	→	USA	03/02											
		Italy	Canada	09/98	→	USA	03/02											
		South Korea	Canada	06/99	→	USA	03/02											
Flat-rolled products of other steel	(722511)	Russia	China	09/00	→	European Union	11/04											
Line pipe	(730410)	Czech Republic	European Union	11/97	→	India	05/00	↔	USA	08/00								
		Japan	Venezuela	06/00	↔	USA	06/00	↔	Mexico	11/00								
		Romania	European Union	11/97	→	Brazil	10/99	→	India	05/00	↔	USA	08/00					
		Russia	European Union	11/97	→	India	05/00											
Other tubes, pipes	(730630)	Brazil	Canada	01/92	→	USA	11/92											
		South Korea	Canada	01/83	→	USA	05/84											
		Romania	European Union	04/90	→	Canada	07/91											
		Thailand	Australia	02/00	→	European Union	09/02											
		Turkey	USA	05/86	→	European Union	04/91											
		Turkey	European Union	09/02	→	Canada	12/03											
		Taiwan	Canada	11/92	↔	USA	11/92											
		Venezuela	European Union	04/91	↔	Canada	07/91	→	USA	11/92								
Other tubes, pipes	(730640)	Taiwan	Canada	09/91	→	USA	12/92											
Tube or pipe fittings	(730719)	Brazil	Mexico	10/96	→	Turkey	07/00	↔	European Union	08/00	→	Argentina	04/03					
		China	Mexico	04/93	↔	USA	09/93	→	Argentina	10/97	→	Turkey	07/00	↔				
			European Union	08/00	→	USA	04/03	↔	Argentina	04/03								
		South Korea	USA	05/86	→	Australia	09/90											
		Taiwan	USA	05/86	→	Australia	09/90											
Tube or pipe fittings	(730723)	Japan	USA	03/88	↔	Canada	08/88											
Tube or pipe fittings	(730793)	China	USA	07/92	→	European Union	03/96											
		Thailand	USA	07/92	→	European Union	03/96											
Stranded wire, ropes, cables	(731210)	China	European Union	08/99	→	South Africa	08/02	→	Turkey	12/04								
		India	European Union	08/99	→	USA	01/04											
		South Korea	South Africa	08/02	→	USA	01/04											
		Mexico	European Union	08/99	→	USA	01/04											

Product	(HS6)	Target country	AD measures by				AD measures by				AD measures by				AD measures by		
		Russia	European Union	08/01	→	Turkey	12/04										
		Thailand	European Union	08/01	→	USA	01/04										
Barbed wire of iron or steel	(731300)	Argentina	USA	11/85	↔	Canada	11/85										
Chain and parts thereof	(731582)	China	Mexico	07/03	↔	Turkey	12/03										
Screws, bolts, nuts	(731812)	China	Canada	01/05	→	European Union	11/05										
		Taiwan	Canada	01/05	→	European Union	11/05										
Table, kitchen or other household article	(732394)	Taiwan	USA	12/86	→	Mexico	10/90										
Magnesium	(810411)	China	USA	05/95	→	India	07/98	↔	European Union	11/98	→	USA	11/01	→			
			Brazil	10/04													
		Russia	USA	05/95	→	European Union	06/96										
		Ukraine	USA	05/95	→	European Union	06/96										
Handtools	(820110)	China	South Africa	12/93	→	Mexico	11/94										
Handtools	(820130)	China	USA	02/91	→	South Africa	01/93										
Interchangeable tools for handtools	(820750)	China	Brazil	12/98	→	Argentina	08/00	→	Argentina	08/04	→	Turkey	02/05				
Padlocks and locks	(830110)	China	Mexico	09/94	→	Brazil	12/95	→	Venezuela	08/97	→	Argentina	06/98				
Padlocks and locks	(830140)	China	South Africa	01/02	→	Turkey	07/03										
Air conditioning machines	(841510)	China	Argentina	02/03	→	Trinidad Tobago	10/04	→	Turkey	07/06							
Agricultural machinery	(843290)	Brazil	Australia	07/91	→	Mexico	06/92	→	Argentina	09/96							
Washing machines	(845011)	South Korea	New Zealand	06/01	→	Australia	09/03										
Parts and accessories of the machines	(847330)	South Korea	European Union	03/93	↔	USA	05/93										
Ball bearings	(848210)	China	Argentina	12/02	→	India	03/04										
		Japan	USA	05/89	→	Mexico	06/90										
		Thailand	USA	05/89	→	European Union	10/90	→	South Korea	01/93							
Electric motors and generators	(850140)	China	Mexico	11/94	→	Argentina	11/95										
Electromagnets	(850519)	China	Brazil	06/98	→	India	07/99										
Batteries	(850610)	China	South Korea	04/00	→	India	07/01	→	Egypt	06/04							
Electric storage batteries	(850710)	Indonesia	Australia	05/91	→	New Zealand	12/91										
		South Korea	Australia	05/91	→	New Zealand	12/91	↔	Turkey	05/92							
		Malaysia	Australia	05/91	→	New Zealand	12/91										
		Philippines	Australia	05/91	→	New Zealand	06/92										
Microwave ovens	(851650)	South Korea	European Union	12/95	→	Argentina	09/96										
Unrecorded media for sound recording	(852320)	Japan	USA	04/89	→	European Union	10/93										
Boards, panels	(853710)	Japan	European Union	04/94	→	USA	09/96										
Discharge lamps	(853931)	China	European Union	07/01	→	India	11/02										
Electronic integrated circuits	(854211)	Japan	USA	08/86	→	European Union	03/91										
Bicycles and other cycles	(871200)	China	Canada	12/92	→	European Union	09/93	→	Argentina	11/95							
		China	Argentina	05/02	→	Malaysia	01/03										
		Taiwan	European Union	02/99	→	Argentina	05/02										
Optical fibers	(900110)	South Korea	South Africa	03/00	↔	India	06/00										
Other metal furniture	(940320)	China	Australia	10/01	→	USA	06/02										

Product	(HS6)	Target country	AD measures by			AD measures by			AD measures by			AD measures by		
Paint brushes	(960340)	China	USA	02/86	→	European Union	03/89							
Slide fasteners	(960711)	China	Peru	08/02	→	Turkey	03/05							
Pencils and crayons	(960910)	China	Mexico	10/94	↔	USA	12/94	→	Argentina	11/95	→	Brazil	02/97	→
			Argentina	02/02	→	Turkey	01/03							
Pocket lighters	(961310)	China	European Union	11/91	→	Argentina	03/95	↔	Turkey	05/95	→	South Korea	11/97	→
			Poland	11/98	→	Mexico	05/99	→	Turkey	05/02				
		Japan	European Union	11/91	→	Argentina	03/95							
		South Korea	European Union	11/91	→	Argentina	03/95							
		Vietnam	Poland	11/00	→	European Union	09/03							
Vacuum flasksrs	(961700)	China	Brazil	07/99	→	Argentina	10/01							

Notes: Antidumping echoing cases identified when measures imposed by subsequent countries within 5 years and overlapping with previous measures (i.e., previous measures still in force) Shaded cases represent simultaneous echoing cases (i.e., measures imposed within 6 months from previous measures). Echoing cases involving more than 4 countries are split across lines.

Table 2: Summary of AD initiations and measures

Initiations			Measures		
USA	*1,110*	*20.50%*	*European Union*	*544*	*19.50%*
European Union	*888*	*16.40%*	*USA*	*487*	*17.46%*
Canada	*511*	*9.44%*	*Canada*	*302*	*10.82%*
Australia	*452*	*8.35%*	*India*	*301*	*10.79%*
India	*374*	*6.91%*	*Argentina*	*151*	*5.41%*
Mexico	*249*	*4.60%*	*Australia*	*143*	*5.13%*
South Africa	*242*	*4.47%*	*South Africa*	*134*	*4.80%*
Argentina	*227*	*4.19%*	*Mexico*	*129*	*4.62%*
Turkey	*191*	*3.53%*	*Turkey*	*127*	*4.55%*
Brazil	*166*	*3.07%*	*China*	*83*	*2.97%*
China	*135*	*2.49%*	*Brazil*	*81*	*2.90%*
Taiwan	*128*	*2.36%*	*Peru*	*62*	*2.22%*
Peru	*114*	*2.11%*	*South Korea*	*58*	*2.08%*
South Korea	*105*	*1.94%*	*New Zealand*	*52*	*1.86%*
New Zealand	*104*	*1.92%*	*Taiwan*	*31*	*1.11%*
Indonesia	65	1.20%	Indonesia	28	1.00%
Colombia	46	0.85%	Colombia	19	0.68%
Egypt	38	0.70%	Venezuela	16	0.57%
Thailand	31	0.57%	Malaysia	5	0.18%
Philippines	29	0.54%	Philippines	5	0.18%
Venezuela	27	0.50%	Poland	5	0.18%
Israel	26	0.48%	Thailand	5	0.18%
Malaysia	17	0.31%	Egypt	4	0.14%
Chile	14	0.26%	Japan	4	0.14%
Finland	13	0.24%	Trinidad and Tobago	4	0.14%
Poland	12	0.22%	Jamaica	2	0.07%
Trinidad Tobago	12	0.22%	Ecuador	1	0.04%
Austria	11	0.20%	Finland	1	0.04%
Sweden	11	0.20%	Guatemala	1	0.04%
Japan	10	0.18%	Israel	1	0.04%
Ukraine	10	0.18%	Latvia	1	0.04%
Latvia	7	0.13%	Lithuania	1	0.04%
Lithuania	7	0.13%	Norway	1	0.04%
Costa Rica	6	0.11%	Pakistan	1	0.04%
Uruguay	6	0.11%			
Czech Republic	3	0.06%			
Jamaica	3	0.06%			
Pakistan	3	0.06%			
Nicaragua	2	0.04%			
Panama	2	0.04%			
Singapore	2	0.04%			
Bulgaria	1	0.02%			
Ecuador	1	0.02%			
Guatemala	1	0.02%			
Norway	1	0.02%			
Paraguay	1	0.02%			
Slovenia	1	0.02%			
	5,415	100.00%		2,790	100.00%

Notes: countries in *italics* are included in the econometric analysis (as importers).

Table 3: Summary of echoing cases

Target countries		AD imposing countries		Sectors (HS2)		
Argentina	0.43%	Argentina	7.50%	Edible vegetables	(07)	0.43%
Belarus	0.85%	Australia	6.11%	Preparations of vegetables, fruit, nuts	(20)	1.28%
Belgium	0.43%	Brazil	4.36%	Salt; sulfur; earths and stone; plastering materials, cement	(25)	2.13%
Brazil	2.98%	Canada	7.33%	Ores, slag and ash	(26)	0.43%
China	24.68%	China	3.66%	Mineral fuels, mineral oils	(27)	0.43%
Czech Republic	0.43%	Colombia	1.92%	Inorganic chemicals	(28)	5.53%
European Union	1.70%	Ecuador	0.17%	Organic chemicals	(29)	7.23%
France	1.28%	Egypt	0.52%	Fertilizers	(31)	1.70%
German Dem. Rep.	0.43%	European Union	16.06%	Miscellaneous chemical products	(38)	0.43%
Germany	0.43%	Guatemala	0.17%	Plastics and articles thereof	(39)	8.94%
Greece	0.43%	India	6.98%	Rubber and articles thereof	(40)	3.40%
Hong Kong	0.43%	Indonesia	2.09%	Paper and paperboard	(48)	2.13%
Hungary	0.43%	Israel	0.17%	Man-made filaments	(54)	2.98%
India	4.26%	Jamaica	0.35%	Man-made staple fibers	(55)	4.26%
Indonesia	2.55%	Japan	0.17%	Wadding; special yarns, twine, cordage, ropes and cables	(56)	0.43%
Israel	0.43%	Latvia	0.17%	Other made up textile articles	(63)	0.85%
Italy	0.43%	Lithuania	0.17%	Footwear	(64)	0.43%
Japan	5.96%	Malaysia	0.35%	Articles of stone, plaster, cement, asbestos, mica	(68)	0.43%
Kazakhstan	1.70%	Mexico	5.06%	Ceramic products	(69)	0.43%
Latvia	0.43%	New Zealand	1.22%	Glass and glassware	(70)	1.70%
Macedonia	0.43%	Peru	1.57%	Iron and steel	(72)	24.7%
Malaysia	0.85%	Philippines	0.87%	Articles of iron or steel	(73)	13.2%
Mexico	1.28%	Poland	0.52%	Tin and articles thereof	(81)	1.28%
Moldova	0.43%	South Africa	3.32%	Tools of base metal	(82)	1.28%
Pakistan	0.43%	South Korea	2.09%	Miscellaneous articles of base metal	(83)	0.85%
Philippines	0.43%	Taiwan	1.22%	Nuclear reactors, boilers, machinery and mechanical appliances	(84)	2.98%
Poland	0.85%	Thailand	0.70%	Electrical machinery and equipment	(85)	5.11%
Portugal	0.43%	Trinidad Tobago	0.70%	Vehicles other than railway or tramway rolling stock	(87)	0.85%
Romania	2.55%	Turkey	7.16%	Optical, photographic, medical and other instruments	(90)	0.43%
Russia	5.96%	USA	15.18%	Furniture	(94)	0.43%
Singapore	0.85%	Venezuela	2.09%	Miscellaneous manufactured articles	(96)	3.40%
Slovak Republic	0.43%					
South Africa	0.85%					
South Korea	12.77%					
Taiwan	5.11%					
Thailand	5.11%					
Turkey	1.70%					
USA	2.98%					
USSR	0.43%					
Ukraine	4.26%					
United Kingdom	0.43%					
Venezuela	0.43%					
Vietnam	0.43%					

Table 4: Benchmark results

	Traditional users		New users	
	(1)	(2)	(3)	(4)
$\theta_{i,s}$	0.010***	0.016***	0.008***	0.013***
	(0.002)	(0.004)	(0.001)	(0.002)
$\theta_{i,s}^2$	0.003	0.000	-0.010***	-0.015***
	(0.003)	(0.005)	(0.002)	(0.003)
Trade share$_{i,j,k,t-2}$		0.003***		0.003***
		(0.000)		(0.000)
Trade growth$_{i,j,k,t-2}$		0.000		-0.000
		(0.000)		(0.000)
Measure by traditional users$_{i,k,t/t-4}$	0.003***	0.002	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by traditional users$_{i,k,t/t-4}$ X $\theta_{i,s}$	0.077	0.094***	0.081***	0.104***
	(0.040)	(0.032)	(0.029)	(0.038)
Measure by traditional users$_{i,k,t/t-4}$ X $\theta_{i,s}^2$	0.022	-0.013	-0.123**	-0.153**
	(0.058)	(0.047)	(0.048)	(0.065)
Measure by new users$_{i,k,t/t-4}$	0.001***	0.002***	0.002***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by new users$_{i,k,t/t-4}$ X $\theta_{i,s}$	0.090***	0.088***	0.093***	0.103***
	(0.029)	(0.029)	(0.029)	(0.037)
Measure by new users$_{i,k,t/t-4}$ X $\theta_{i,s}^2$	-0.139***	-0.142***	-0.086**	-0.088
	(0.040)	(0.040)	(0.044)	(0.055)
Importer X exporter X year effects	Yes	Yes	Yes	Yes
HS2 effects	Yes	Yes	Yes	Yes
Observations	3,332,672	1,767,940	5,147,961	2,977,760
R^2	0.010	0.013	0.036	0.039

Notes: The dependent variable takes a value of 1 if the importing country *i* introduces an AD measure against country *j* in the 4-digit HS sector *k* in year *t* and 0 otherwise. The table reports the estimated coefficients of a linear probability model, with clustered standard errors (at the importing X HS2 level) in parenthesis. ***, ** denote significance at the 1% and 5% level, respectively.

Table 5: Robustness checks – excluding observations without trade or with outliers (in terms of trade)

	Excluding observations without trade		Excluding outliers	
	(1)	(2)	(3)	(4)
$\theta_{i,s}$	0.027***	0.032***	0.016***	0.013***
	(0.009)	(0.005)	(0.004)	(0.002)
$\theta_{i,s}^2$	-0.005	-0.034***	0.000	-0.015***
	(0.012)	(0.008)	(0.005)	(0.003)
Trade share$_{i,j,k,t-2}$	0.002***	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Trade growth$_{i,j,k,t-2}$	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Measure by traditional users$_{i,k,t/t-4}$	0.003**	0.002	0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by traditional users$_{i,k,t/t-4}$ X $\theta_{i,s}$	0.082***	0.106**	0.100***	0.106***
	(0.026)	(0.048)	(0.032)	(0.039)
Measure by traditional users$_{i,k,t/t-4}$ X $\theta_{i,s}^2$	0.003	-0.185**	-0.025	-0.158**
	(0.038)	(0.073)	(0.047)	(0.065)
Measure by new users$_{i,k,t/t-4}$	0.002***	0.002**	0.002***	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by new users$_{i,k,t/t-4}$ X $\theta_{i,s}$	0.081**	0.116**	0.089***	0.103***
	(0.036)	(0.046)	(0.032)	(0.039)
Measure by new users$_{i,k,t/t-4}$ X $\theta_{i,s}^2$	-0.141***	-0.109	-0.151***	-0.087
	(0.049)	(0.069)	(0.044)	(0.057)
Importer X exporter X year effects	Yes	Yes	Yes	Yes
HS2 effects	Yes	Yes	Yes	Yes
Observations	727,344	812,996	1,735,759	2,922,981
R^2	0.015	0.051	0.013	0.036

Notes: The dependent variable takes a value of 1 if the importing country *i* introduces an AD measure against country *j* in the 4-digit HS sector *k* in year *t* and 0 otherwise. The table reports the estimated coefficients of a linear probability model, with clustered standard errors (at the importing X HS2 level) in parenthesis. ***, ** denote significance at the 1% and 5% level, respectively.

Table 6: Robustness checks – excluding weakest AD users

	Traditional users, excluding New Zealand		New users, excluding Peru, South Korea, Taiwan	
	(1)	(2)	(3)	(4)
$\theta_{i,s}$	0.010***	0.017***	0.009***	0.013***
	(0.003)	(0.004)	(0.001)	(0.002)
$\theta_{i,s}^2$	0.004	-0.002	-0.010***	-0.016***
	(0.003)	(0.005)	(0.002)	(0.003)
Trade share$_{i,j,k,t-2}$		0.003***		0.004***
		(0.001)		(0.001)
Trade growth$_{i,j,k,t-2}$		0.000		-0.000
		(0.000)		(0.000)
Measure by traditional users$_{i,k,t/t-4}$	0.004***	0.004**	0.001	0.001
	(0.001)	(0.002)	(0.001)	(0.001)
Measure by traditional users$_{i,k,t/t-4}$ X $\theta_{i,s}$	0.067	0.085**	0.087***	0.115***
	(0.043)	(0.036)	(0.033)	(0.043)
Measure by traditional users$_{i,k,t/t-4}$ X $\theta_{i,s}^2$	0.035	-0.001	-0.138**	-0.175**
	(0.061)	(0.050)	(0.054)	(0.071)
Measure by new users$_{i,k,t/t-4}$	0.002***	0.002***	0.003***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by new users$_{i,k,t/t-4}$ X $\theta_{i,s}$	0.085***	0.082***	0.090***	0.102**
	(0.029)	(0.029)	(0.032)	(0.041)
Measure by new users$_{i,k,t/t-4}$ X $\theta_{i,s}^2$	-0.132***	-0.134***	-0.083	-0.087
	(0.040)	(0.040)	(0.048)	(0.060)
Importer X exporter X year effects	Yes	Yes	Yes	Yes
HS2 effects	Yes	Yes	Yes	Yes
Observations	2,625,448	1,400,776	3,329,039	2,116,190
R^2	0.010	0.013	0.038	0.042

Notes: The dependent variable takes a value of 1 if the importing country *i* introduces an AD measure against country *j* in the 4-digit HS sector *k* in year *t* and 0 otherwise. The table reports the estimated coefficients of a linear probability model, with clustered standard errors (at the importing X HS2 level) in parenthesis. ***, ** denote significance at the 1% and 5% level, respectively.

Table 7: Robustness checks – different time frames for political-economy proxy

	Traditional users, $\theta_{i,s}$ from 1991-1995		New users, $\theta_{i,s}$ from most recent 5-year periods	
	(1)	(2)	(3)	(4)
$\theta_{i,s}$	-0.002	-0.002	0.007***	0.011***
	(0.002)	(0.003)	(0.001)	(0.001)
$\theta_{i,s}^2$	0.045***	0.054***	-0.007***	-0.011***
	(0.008)	(0.011)	(0.002)	(0.002)
Trade share$_{i,j,k,t-2}$		0.003***		0.003***
		(0.000)		(0.000)
Trade growth$_{i,j,k,t-2}$		0.000		-0.000
		(0.000)		(0.000)
Measure by traditional users$_{i,k,t/t-4}$	0.003***	0.003**	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by traditional users$_{i,k,t/t-4}$ X $\theta_{i,s}$	0.020	0.041	0.095***	0.120***
	(0.057)	(0.068)	(0.031)	(0.041)
Measure by traditional users$_{i,k,t/t-4}$ X $\theta_{i,s}^2$	0.301**	0.222	-0.138***	-0.169***
	(0.135)	(0.159)	(0.044)	(0.058)
Measure by new users$_{i,k,t/t-4}$	0.001***	0.001***	0.001***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by new users$_{i,k,t/t-4}$ X $\theta_{i,s}$	0.071***	0.074***	0.116***	0.128***
	(0.019)	(0.019)	(0.027)	(0.034)
Measure by new users$_{i,k,t/t-4}$ X $\theta_{i,s}^2$	-0.175***	-0.203***	-0.110***	-0.114***
	(0.052)	(0.053)	(0.034)	(0.044)
Importer X exporter X year effects	Yes	Yes	Yes	Yes
HS2 effects	Yes	Yes	Yes	Yes
Observations	3,332,672	1,767,940	5,147,961	2,977,760
R^2	0.010	0.013	0.036	0.039

Notes: The dependent variable takes a value of 1 if the importing country *i* introduces an AD measure against country *j* in the 4-digit HS sector *k* in year *t* and 0 otherwise. The table reports the estimated coefficients of a linear probability model, with clustered standard errors (at the importing X HS2 level) in parenthesis. ***, ** denote significance at the 1% and 5% level, respectively.

Figure 1: Two-stage, four-period game

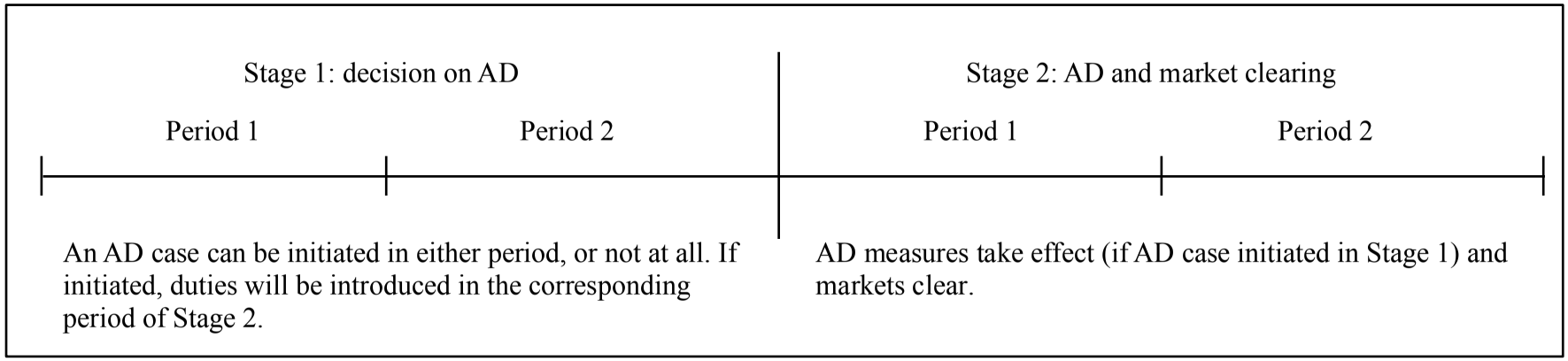

Figure 2: Equilibrium characterization

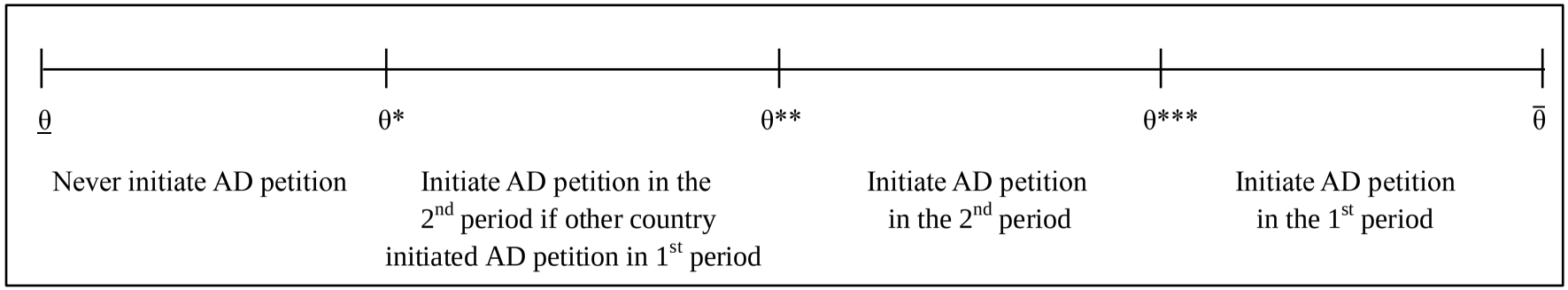

Figure 3: Days between impositions of AD measures in echoing cases

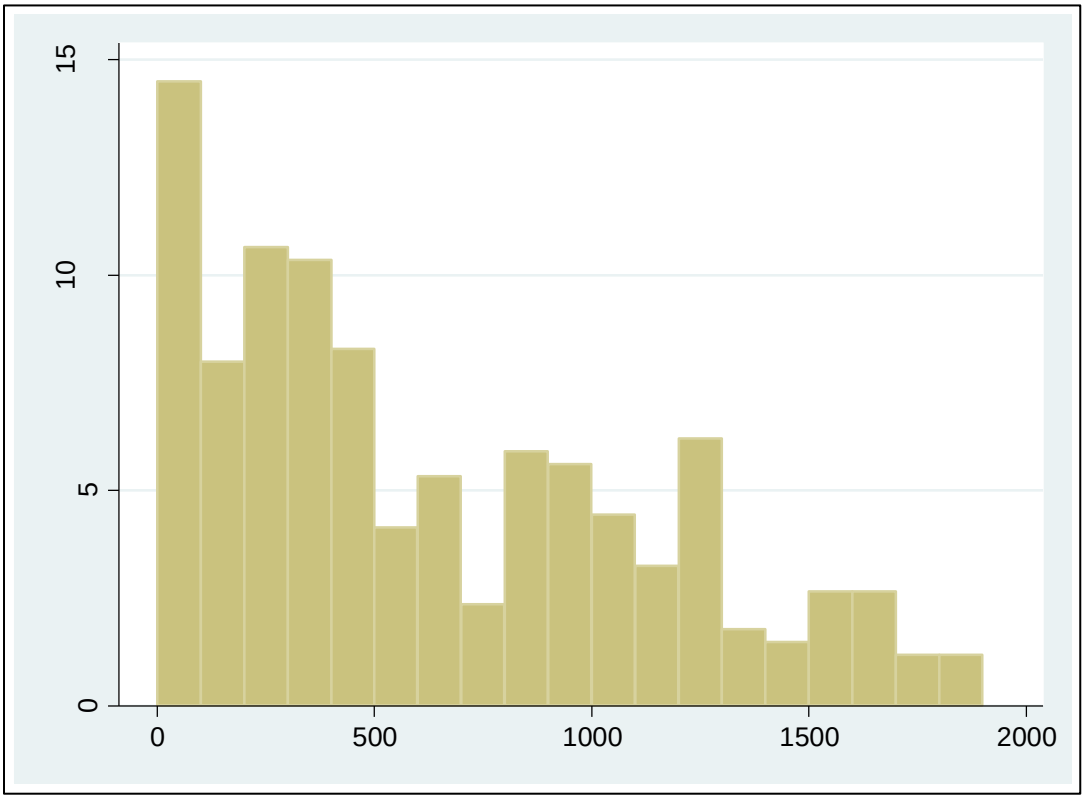

Table A: Sample and sources for antidumping data

Country	Sample			Source
Argentina	1991	-	2004	B + MZ
Australia	1989	-	2004	B + MZ
Austria	1980	-	1995	MZ
Brazil	1988	-	2003	B
Bulgaria	1995	-	2003	B
Canada	1980	-	2005	B + MZ
Chile	1995	-	2003	B
China	1997	-	2005	B
Colombia	1991	-	2004	B
Costa Rica	1996	-	2003	B
Czech Republic	1997	-	2003	B
Ecuador	1995	-	2003	B
Egypt	1997	-	2003	B
European Union	1980	-	2005	B + MZ
Finland	1980	-	1995	MZ
Guatemala	1996	-	2003	B
India	1992	-	2004	B
Indonesia	1996	-	2004	B
Israel	1995	-	2003	B
Jamaica	1995	-	2003	B
Japan	1982	-	2004	B
Latvia	2000	-	2003	B
Lithuania	1998	-	2003	B
Malaysia	1995	-	2003	B
Mexico	1987	-	2003	B
New Zealand	1982	-	2004	B + MZ
Nicaragua	1995	-	2003	B
Norway	1980	-	2003	MZ
Pakistan	1995	-	2003	B
Panama	1996	-	2003	B
Paraguay	1996	-	2003	B
Peru	1992	-	2004	B
Philippines	1993	-	2003	B + MZ
Poland	1997	-	2003	B
Singapore	1985	-	2003	MZ
Slovenia	1995	-	2003	B
South Africa	1992	-	2004	B
South Korea	1986	-	2004	B
Sweden	1980	-	1995	MZ
Taiwan	1983	-	2005	B
Thailand	1995	-	2003	B
Trinidad and Tobago	1995	-	2003	B
Turkey	1989	-	2005	B + MZ
Ukraine	1999	-	2004	MZ
Uruguay	1995	-	2003	B
USA	1980	-	2005	B
Venezuela	1992	-	2004	B

Notes: B stands for Bown (2007) and MZ stands for Moore and Zanardi (2009)