Antidumping Echoing*

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Abstract

This paper documents that antidumping (AD) "echoing" (i.e., different countries sequentially imposing AD measures on the same product from the same exporter) is common practice among users of AD. We develop a dynamic game where two competing importers can impose AD measures on a third exporting country in one of two periods, if at all. Assuming that governments are politically motivated (favoring their import-competing industry), AD echoing occurs only for intermediate values of a country's political-economy parameter. This result is confirmed by our econometric analysis, demonstrating that countries' political-economy-driven AD actions are interdependent and should not be analyzed in isolation.

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1 Introduction

With the strengthening of countries' tariff commitments with the General Agreement on Tariffs and Trade (GATT)/World Trade Organization (WTO) and the worldwide decrease in applied tariff rates, other forms of trade policy have become more important. Antidumping (AD) is nowadays 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 a modern 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. The past literature has also shown that as is the case with other trade instruments, 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 surveys by Blonigen and Prusa (2003, forthcoming) provide detailed overviews of the various effects that AD can give rise to and of its determinants.

From an empirical perspective, the most astonishing fact is that the set of countries that use AD on a regular basis has become much larger in the last two decades. While a handful of developed countries were the almost exclusive users of AD in the 1980s, developing countries such as Argentina, China, and India began using AD systematically in the 1990s and are at this point among its most active users, targeting both developed and developing countries. 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 between 1980 and 1996. 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. To this end, we have assembled worldwide AD data for the period 1980–2005, and identified echoing by matching cases from different importing countries on the basis of the classification and the origin of the products under investigation and the timing of the AD measures. This data-intensive process shows that AD echoing is, indeed, quite common and involves many cases initiated by 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. An echoing case could involve just two importing countries, as in the case of pneumatic tires for cars exported by South Korea and subject to AD measures in South Africa and Egypt in the late 1990s. But it can also involve several importing countries, as in the case of pocket lighters exported by China and targeted with AD measures in six importing countries in the 1990s and 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 relevant not 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 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 two-phase, four-period 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 industry). The predictions of our model are intuitive but not necessarily obvious. We find that AD echoing occurs if a country's political-economy parameter lies in an intermediate range: in such case, 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 in order to offset the trade-deflection effects entailed

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

by the competing importer's action. Instead, if the political-economy parameter exceeds a critical "very high" threshold, the country chooses to impose an AD duty in the first period independently of its competing importer's actions, while if the parameter in question is not "very high" but is still sufficiently "high," the country imposes the duty 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 political (and terms-of-trade) gains.

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 another country's decision to impose AD measures on the same product and against the same exporter(s) only for intermediate values of the latter country's political-economy parameter, since a country would independently introduce such measures if it cared a lot about a given import-competing industry. 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. 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 trade partner in any of the 4-digit Harmonized System (HS) categories. The key variable of interest is the interaction between the AD actions previously carried out by other countries and the country- and sector-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, our results confirm that echoing arises as a result of other countries' AD measures when the government of an importing country cares enough, but not too much, about a given import-competing industry. These conclusions are robust to controlling for other known determinants of AD, such as retaliatory and terms-of-trade protectionist motives, and are not driven by the steel industry, although it accounts for the lion's share of AD actions. To sum up, the theoretical model and the empirical analysis show that the political-economy channels that lead to certain AD actions should be viewed as part of an interdependent decision process across countries. Thus, countries' AD actions 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 trade effects 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 measures decrease from the target country but increase from other sources. Prusa (1997) finds substantial trade-diversion effects in the case of US AD measures, whereas Konings et al. (2001) find limited trade-diversion effects for a sample of EU AD cases (but Brenton, 2001, does find evidence of significant trade-diversion effects in the case of EU AD measures). Similarly, Ganguli (2008) and Park (2009) document substantial 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) study both theoretically and empirically the trade-deflection effects of AD restrictions, they do not examine the sequential imposition of measures on a given product exported by a given country (i.e., they do not examine AD echoing).[3] Last, in an empirical paper, Feinberg and Reynolds (2006) while exploring the role of retaliation in AD filings, they do control for the impact of trade deflection due to past AD cases on current filings. However, they do not consider the interplay of trade deflection with governments' political-economy motivations in affecting countries' AD activity, which is central to our analysis.

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 firms 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) analyzes a model of endogenous timing in prices also with complete information, Mailath (1993) examines a two-

[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] Bown and Crowley (2006) and Durling and Prusa (2006) also analyze empirically the AD-induced country-level trade effects, including trade deflection. Neither paper though looks at AD echoing and the determinants thereof.

period, quantity-setting duopoly game with asymmetrically informed firms, and Daughety and Reinganum (1994) employ a two-period, homogeneous-good quantity choice model wherein information can be acquired by agents.

Finally, we should emphasize that in general terms, our results shed some light on the proliferation of AD activity worldwide in the last couple decades. Much of the past literature on this important issue has explored the role of retaliatory incentives in the recent surge in global AD use (e.g., Blonigen and Bown, 2003; Prusa and Skeath, 2005; Feinberg and Reynolds, 2006). Our findings highlight a different channel whereby AD activity might spread across countries, which has not been studied in depth before: a government may face increased political pressure to introduce AD measures against a given exporter due to the AD actions of third countries vis-à-vis the exporter in question, giving rise to a self-feeding—through trade deflection—AD proliferation process. In fact, Bown and Crowley (2007, p. 198) speculate in their concluding section that (US) trade policy actions might induce trade policy responses by third countries that face deflected trade, contributing to AD proliferation, but leave this as an open question for future research. Our paper formally addresses this question, providing an answer in the affirmative.

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 means of offsetting 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 the dumping strategies. The same motivation justifies the use of AD, as an exception to the principle of non-discrimination, within the context of the WTO.

Nowadays, it is a well-known fact that AD policies are not used anymore by mainly 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 almost exclusive users of this policy instrument. By contrast, countries such as Argentina, China, and India, to name just a few, rank very highly at present in the imposition of AD protection according to the WTO official statistics. 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 with regard to the employment of this policy instrument are fairly similar across countries since they have to adhere to the AD Agreement of the WTO, which is automatically binding for all WTO member countries.[5] The circumstances under which AD measures can be introduced within the WTO framework are specified in 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 normal or 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 of 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 a 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 investigation is 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 an AD law.

[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 quite 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 periods of maximum five years) through reviews because of evidence that the expiry of the measures would likely lead to the continuation or recurrence of dumping and injury.[7] AD measures can take different forms: ad valorem or specific duties, or price undertakings through which foreign exporters commit to stop dumping. In all cases, the measures are not only country- but also firm-specific (and within a country, some firms may be found not guilty of dumping 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 the measures are in place, they can be reviewed upon request by any interested party for possible adjustments.[8] Similarly, a review is conducted if the domestic industry requests the extension of the measures past their initial validity period.

3 Theoretical 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 two-phase, four-period 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 phase is the "AD initiation phase," where the former decide on whether to initiate an AD case against the latter, and if so, in which of two periods. The second phase is the "AD implementation phase," where the AD duties are optimally determined in accordance with the phase-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

[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 duration of AD measures and the ramifications of the WTO provisions introduced in 1995 regarding the mandatory five-year sunset 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.

they seek to maximize. For this dynamic game, we propose a candidate perfect Bayesian equilibrium and verify its existence numerically.

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:

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

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

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:

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

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 $\left(\partial \pi_i / \partial q_i^j\right) = 0$ for $j \in \{A, B, C\}$, we obtain firm i's (three) first-order conditions, yielding:

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

where $-j \in \{A, B, C\} \setminus \{j\}$. The solution to the system of the nine first-order conditions (i.e., three per 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, which is consistent with the empirical evidence on trade deflection discussed earlier.

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:

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

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 introduce the following symmetry assumption: $K^B_A = K^C_A \equiv \widetilde{K}$.

The countries face a two-phase, four-period horizon, with each phase consisting of two periods, as illustrated in Figure 1. Phase 1 is the "AD initiation phase." More specifically, in

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

this first two-period phase, 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. Phase 2 is the "AD implementation phase." In particular, should an AD case be initiated in either period of phase 1, then the level of the AD duty is optimally determined in the corresponding period of phase 2.[10] For instance, if countries B and C both choose to initiate an AD case against A in the second period of phase 1, then they simultaneously pick their AD duty in the second period of phase 2. Markets clear and payoffs are realized at the end of phase 2.

Our two-phase, 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 countries' optimal AD duties. The reason is that given our setting, once phase 2 is reached, countries are aware of the precise nature of the AD duty game they will play (e.g., Cournot versus Stackelberg game).

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 dynamic game, in which:[11]

(a) For $k \in \{B, C\}$ and $-k \in \{B, C\} \setminus \{k\}$, (i) if country k's political-economy parameter is such that $\theta^{\star\star\star} \leq \theta^k \leq \overline{\theta}$, then country k initiates an AD case against country A in the first period of phase 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 phase 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 phase 1 if and only if country $-k$ has done so in the first period of phase 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.

[10] In principle, the magnitude of AD measures is constrained under the WTO AD Agreement. However, as we argued above, the agreement in question leaves substantial flexibility for its implementation. Furthermore, restricting the magnitude of the AD duties that the countries can impose would leave our qualitative results unaffected, since all the main forces at work in our model would still be in effect.

[11] Notice that if $\widetilde{K}$ were equal to zero (i.e., if AD were costless), in equilibrium 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).

(b) If, in accordance with equilibrium condition (a), country k initiates an AD case against country A in either period of phase 1, the AD duty level it selects in the corresponding period of phase 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.

As shown in Figure 2, the three critical values of θ described above divide the interval $\left[\underline{\theta}, \overline{\theta}\right]$ into four parts. It is intuitive to understand that a "high" value of the political-economy parameter θ (i.e., $\theta \geq \theta^{\star\star}$) will result in AD measures being introduced independently of the competing importer's actions, whereas, given the AD cost $\widetilde{K}$, a "low" value of θ (i.e., $\theta < \theta^{\star}$) will preclude any AD activity. AD echoing occurs for intermediate values of θ, in which case 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 will take place, substantially hurting the domestic firm, unless the policymaker intervenes and provides it with some trade protection.[12] Notice that our assumption of increasing marginal cost of production is essential for trade deflection to occur, and thus, for AD echoing to arise, as it makes each firm's output choices across markets interdependent (whereas under constant marginal cost, a firm's quantity decisions across markets would be independent of one another).[13]

[12] Our model is already rather complicated and thus, we choose to not explicitly model any shocks to the economic environment that could potentially affect countries' AD behavior. In any case, we expect that the introduction of supply shocks into our framework would only generate an additional, but *similar*, channel through which AD echoing might arise, reinforcing our qualitative results. For example, a positive supply shock in country A lowering its production costs would boost its exports to countries B and C. The latter countries should then behave like in our current framework: a "high"-θ country would immediately initiate an AD case against country A, a "low"-θ country would not respond at all, while an intermediate-θ country would echo the AD actions, if any, of its competing importer (to mitigate their trade-deflection effects). On the other hand, we expect that demand shocks would be less likely to eventually lead to AD echoing. For instance, a positive demand shock in country B would raise its imports from both countries A and C, while reducing the trade flows between the latter countries. An ensuing AD action by country B against country A—in case such action took place at all—would stimulate A's exports to country C. However, the combined impact on country A's exports to country C of the demand shock in country B and B's consequent AD action would be *ambiguous*. Nonetheless, the fact that in our econometric analysis, we do obtain robust evidence in support of our theoretical model's main predictions leads us to believe that demand shocks are not predominant in our data.

[13] Bown and Crowley (2007) also assume an increasing marginal cost of production. Most importantly, they provide empirical evidence of trade deflection due to AD restrictions, which as we argued, can only arise under

We now formally characterize the equilibrium of our two-phase, 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 both countries B and C behave in equilibrium as described above.

Turning to country B, the lower critical value $\theta^{B\star}$ is the value of θ^B for which, in expected terms and given that country C has initiated an AD case against country A in the first period of phase 1, country B is indifferent between never initiating an AD case against A and initiating one in the second period of phase 1. In the latter case, country B will behave as a Stackelberg follower in the AD duty game with country C in phase 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 behaving as a Stackelberg follower in the AD duty game with country C, 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 the value of the political-economy parameter for which, given that neither country has initiated an AD case against country A in period 1 of phase 1, country B is indifferent between initiating an AD case in the second period of phase 1 and not taking any AD action in period 2 either.[14] The payoffs of these two actions depend on whether country C will initiate an AD case in period 2 (with probability $\frac{\theta^{C\star\star\star}-\theta^{C\star\star}}{\theta^{C\star\star\star}-\underline{\theta}}$, in which case country B could either be in a Cournot game or receive W^B_{NODUTY}) or not (with probability $\frac{\theta^{C\star\star}-\underline{\theta}}{\theta^{C\star\star\star}-\underline{\theta}}$, in which case country B could be either a monopolist or in a situation of free trade). The following equation formally states this indifference condition and implicitly

such a cost structure.

[14] Equivalently, $\theta^{B\star\star}$ is the value of θ^B for which country B is indifferent between (i) initiating an AD case in the second period of phase 1 regardless of country C's behavior in the first period; and (ii) initiating an AD case in period 2 of phase 1 only if country C has done so in the first period.

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 A while country C does not, and $W^B_{FREETRADE}$ is the payoff for B under the scenario where neither country B nor country 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 phase 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 $\frac{\overline{\theta}-\theta^{C\star\star\star}}{\overline{\theta}-\underline{\theta}}$, in period 2 with probability $\frac{\theta^{C\star\star\star}-\theta^{C\star\star}}{\overline{\theta}-\underline{\theta}}$, while it will never initiate an AD case with probability $\frac{\theta^{C\star}-\underline{\theta}}{\overline{\theta}-\underline{\theta}}$. Also, with probability $\frac{\theta^{C\star\star}-\theta^{C\star}}{\overline{\theta}-\underline{\theta}}$, 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:

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

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

Having characterized the equilibrium, the model is rather complicated to obtain a closed-form solution. Therefore, in the next subsection, we resort to numerical analysis to gain some further insights.

3.4 Numerical Solution

As we argued above, to derive an equilibrium of the desired class, we need to rely on numerical analysis.[15] 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 specified 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 will be diverted, ceteris paribus, away from the former and towards country B (i.e., trade deflection will take place). This induces country B to also impose an AD duty on A, incurring

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

the cost $\widetilde{K}$, as long as its government is 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, as a highly politically motivated government will always wish 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 phase 1. In fact, this is true in equilibrium, even though our numerical analysis reveals that in the AD duty game with country C, country B's expected payoff when behaving as a Stackelberg follower strictly exceeds the one when acting as a Stackelberg leader for any θ^B. To understand country B's equilibrium behavior for $\theta^B \geq \theta^{B\star\star\star}$, notice that in the AD duty game in question, if country B initiates the AD case against A in period 1 of phase 1, it will most likely be a Stackelberg leader, whereas if it does so in period 2 of phase 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) country B's expected payoff when acting as a Stackelberg leader strictly exceeds the period-2 Cournot one; and (ii) the difference in country B's expected payoff under being a Stackelberg follower and when acting as a Stackelberg leader becomes "small." It thereby 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 the first period of phase 1.

3.4.1 Comparative Statics

In order to better understand the forces at work in our model, we next engage in some comparative statics with respect to the AD-cost parameter $\widetilde{K}$. We first consider the case where the cost in question is 5% higher 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 now higher, whereas the upper one is lower. 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 country 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. More specifically, our numerical analysis reveals that for "large" θ^k ($k \in \{B, C\}$) and in comparison with our benchmark scenario, in the "high-cost" case (i) the difference between the expected payoff when acting as a Stackelberg leader and the period-2 Cournot one is smaller, strengthening the countries' incentive (relative to the benchmark scenario) to wait until period 2 of phase 1 in order to initiate their AD case against country A; but at the same time, (ii) the difference in countries' expected payoff under being a Stackelberg follower and when acting as a Stackelberg leader is smaller as well, strengthening their incentive to initiate their AD activity against A in the first period of phase 1. Our numerical analysis also shows that the latter force is relatively stronger, giving rise to our finding.

We last decrease $\widetilde{K}$ by 5% relative to our benchmark scenario (i.e., we set $\widetilde{K} = 0.0095$). The resulting equilibrium critical values of the political-economy parameter for countries 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 findings obtained in the "high-cost" case, and the intuition underlying them is analogous to the one provided 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 as 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 of our sample). 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.[16] Missing data from both sources have been supplemented, where possible, by searching the publications of investigating authorities and of the WTO (i.e., semi-annual reports of the Committee on AD Practices, and Trade Policy Reviews).

For each petition recorded in the dataset, we have information about all the important pertinent dates and decisions.[17] 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 over the sample period 1980–2005. A large majority of these investigations reached the final stage, and 2,790 of all petitions (i.e., 51.5% of them) 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 ranks all the AD-active countries in terms of either initiations or actual implementation of AD measures.[18] According to the table, the US and the EU top both rankings, but, as already highlighted in the literature, many developing countries are heavy users of AD protection.

In the econometric analysis, we control for the value and growth of sectoral trade between a given country pair. Trade values are extracted from the UN Comtrade database, and are unfortunately available only for a subset of the years in the sample period. In some robustness checks, we use employment data from UNIDO, as well as the number of trade associations, kindly provided by Ludema and Mayda (2013), and estimated export supply elasticities, kindly provided by Nicita et al. (2013).

[16] 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.

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

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

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 and description, the identity of exporting firms involved in an investigation, references to related cases found in official publications of the investigating authorities, while imposing at the same time the condition that an echoing investigation must take place before the echoed case has been terminated or has expired. 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 code supplied by the investigating authorities[19]) exported by a *given country* is *simultaneously* subject to AD measures in two or more importing countries and the imposition of these measures took place *within five years* from each other.[20] Our definition differs from Maur's (1998) in some important respects due to theoretical and practical reasons. In line with our theoretical model, we focus only on AD measures rather than simply looking at AD initiations. Moreover, our benchmark definition involves measures that are echoed within five years, because actions farther away from each other are most likely not the result of political pressures that are the focus of our theoretical model.[21] Finally, on practical grounds, we rely only on HS codes and product descriptions to identify the goods subject to AD echoing, since details of exporters 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 definition of AD echoing, Table 1 reports the 235 echoing cases identified in our dataset (sorted by HS code). 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 five years from the previous one and while the latter is still in force.[22] For example, the first row of Table 1 shows that the US imposed AD measures on fresh garlic from China in November 1994, and Canada followed suit imposing measures in March 1997.

[19] Information is sometimes available at the 8-digit level, but these codes are not comparable across countries.

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

[21] Instead, Maur (1998) did not impose any time limit between AD cases when defining echoing.

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

However, polyvinyl chloride (HS code 390410) from the US has been subject to AD measures in ten countries (the maximum in the sample), but still counts as one echoing case. In total, 573 petitions are part of 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 relevant not only for developed countries.

Trying to analyze the long list reported in Table 1, Table 3 presents an overview of the targeted countries, the importing countries, and the industrial sectors that are involved in the echoing cases. China is the most frequently targeted exporting country (24.7% of the times), with South Korea a distant second (12.8% of the times) out of a total of 43 countries. The list of the importing countries imposing the AD measures 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 16.1% and 15.2% of the measures, respectively. And the steel industry (i.e., HS codes 72–83) clearly dominates among industrial sectors with a 41% share of the total measures, followed by the chemical industry (i.e., HS codes 28–38) with almost a 15% share.

Overall, the picture emerging from Table 3 is in line with general accounts 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 by the EU and the US has shrunk substantially, with new users such as Argentina, 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% of them for the years from 1996 until the end of the sample period. On the other hand, China introduced an AD law only in 1997, and is responsible for more echoing AD measures than Australia in this recent subsample period.

Looking at the time pattern of AD echoing, Figure 3 reports the distribution of the time lag between impositions of AD measures in the echoing cases. The average lag between two sequential 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). In other words, in our echoing cases, AD measures are typically echoed within two years, and this is the time frame that we will use in the econometric analysis that follows to define echoing.[23]

Focusing on the 15 heavy AD users that will form the sample for the econometric analysis in the next subsection, Table 4 provides other descriptive statistics to quantify and further characterize AD echoing. Panel A of the table provides a comparison of unconditional and conditional probabilities of introduction of AD measures in a 4-digit HS sector against an exporter in our sample, with the latter probabilities conditioning on a new AD measure having been recently introduced by another country in the same 4-digit HS sector and against the same exporter.[24] The first row of Table 4 shows that AD is a rare phenomenon: AD measures are introduced in fewer than 0.025% of the observations in our sample. However, the probability of observing AD echoing is dramatically larger: 0.721% when a new measure has been introduced by another country against the same exporter and in the same 4-digit HS sector over the two-year period $t/t-1$, with a decaying effect for measures introduced farther back in time (i.e., when considering instead a three- or a four-year period). These patterns are common to both traditional and new users of AD (although all probabilities are higher for the sample of traditional users). Furthermore, the probability of AD echoing basically doubles when conditioning on more than one new AD measure having been recently introduced by other countries (in the same 4-digit HS sector and against the same exporter). This is in line with the predictions of our theoretical model: when multiple countries restrict the trade flows of a given product supplied by a given exporter, trade deflection is likely to be more pronounced, which should make more likely further AD actions targeting the product and exporter in question.

Panel B in Table 4 shows instead summary statistics of trade shares for sectors without AD, with non-echoing AD measures, and with echoing AD measures. It is clear that AD

[23] Using this time frame, 383 petitions are part of 172 AD echoing cases.

[24] The analysis is done at the 4-digit HS level, as our econometric analysis in the next subsection, because of data considerations.

measures target trade partners with substantial import market shares. Nevertheless, it does not seem to be the case that echoing AD measures target exporters with larger import market shares than non-echoing AD measures—this is true independently of the time frame chosen to define echoing. Notice that our theoretical model does not necessarily suggest that this should or should not be the case. In fact, according to our model, echoing should be the result only of the interaction of past AD measures by third countries and domestic political-economy pressures.

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 the 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 an importing country cares enough, but not too much, about a given import-competing industry. In fact, if the weight attached by the government to an industry is "high," AD measures should be introduced irrespective of the AD actions by other competing importers.

The econometric analysis is based on the countries that have made major and systematic use of AD over our sample period. Based on Table 2, which reports summary statistics on initiations and impositions of AD measures, we select the five traditional users (i.e., Australia, Canada, the EU, New Zealand, and the US), and the ten most active new users: Argentina, Brazil, China, India, Mexico, Peru, South Africa, South Korea, Taiwan, and Turkey. These countries filed a total of 4,996 petitions during our sample period, representing 92.3% of worldwide recorded petitions over the period in question, 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% of these countries' petitions led to measures versus 51.5% for the whole set of countries). In terms of echoing, 469 out of the 2,685 petitions with final measures are involved in echoing (i.e., 17.5% of them) 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 is the bilateral-sectoral level over time between the 15 importing countries identified above as major AD users and the corresponding 39 exporting countries when the 25 EU members are considered individually as exporters.[25] 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 subsection, we defined echoing by looking at the 6-digit HS product classification, while the econometric analysis is conducted on a more aggregate industry level. The reason is that the occurrence of an AD action is overall a rare event among all the industrial sectors of an economy (i.e., Table 4 shows that the dependent variable is equal to 1 in only 0.024% of the observations), and this issue would be exacerbated at a more disaggregated level. Moreover, at the 6-digit HS level, trade data are available on an even more limited basis and would include a much larger number of observations with zero bilateral trade flows.

We then estimate the following linear probability model:

$$y_{i,j,k,t} = \alpha_{i\times j\times t} + \eta_s + \beta_1 \Theta_{i,s} + \beta_2 X_{j,g,k,t/t-1} + \beta_3 \Theta_{i,s} \cdot X_{j,g,k,t/t-1} + \gamma Z_{i,j,k,t-2} + \varepsilon_{i,j,k,t}, \quad (9)$$

where $\alpha_{i\times j\times t}$ represents three-way fixed effects (importing country $\times$ exporting country $\times$ year effects), 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, $X_{j,g,k,t/t-1}$ indicates whether a group of countries g has introduced final AD measures against country j in sector k within the two-year period between t and $t-1$, $Z_{i,j,k,t-2}$ includes trade control variables, and $\varepsilon_{i,j,k,t}$ is the error term. The standard errors are clustered at the importer $\times$ 2-digit-HS-sectoral level in all regressions. β_1, β_2, β_3, and γ are the (vectors of) coefficients to be estimated.[26]

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. More specifically, we count the total number of AD measures introduced by each importing country in each of its 2-digit HS sectors during the period 1999–2003. A five-year window should be long enough

[25] We exclude intra-EU observations as well as the EU as an exporter (since we include its individual member states). We also drop from consideration the few AD measures targeting the EU at large.

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

for the preferences of the policymaker to be revealed. The choice of the most recent period when data are available for all importers guarantees that we are excluding the first few years after the introduction of their AD law when the AD system is not yet well established.[27] 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 impose a similar 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, by construction, our proxy is endogenous since it is a function of the dependent variable. However, the unit of analysis is at a much more disaggregated level than the level at which $\theta_{i,s}$ is constructed (i.e., 4-digit versus 2-digit HS level), and it also includes a geographical dimension (i.e., targeted country) that is missing from the construction of the proxy. Therefore, the contribution of any single observation to the construction of the $\theta_{i,s}$ variable is minimal and the potential endogeneity problem should not be serious. To make sure that this is the case, we check the robustness of our benchmark results using three strategies. First, we use employment levels by 2-digit HS code as a proxy for our political-economy parameter. Given the limited time-series availability of the data, we do not exploit time variation but take the employment level available for the year as close as possible to the midpoint of the sample for each country. Second, we use the number of trade associations by 2-digit HS code, which are used by Ludema and Mayda (2013) to proxy for political organization (although these data are not available for China, South Africa, Taiwan, and Turkey).[28, 29] Finally, the long timespan of the sample for traditional users allows us to carry out the empirical analysis over the period 1980–1998 with the proxy calculated over the years 1999–2003.

The political-economy proxy matrix $\Theta_{i,s}$ is interacted with an indicator variable of AD

[27] Among the new users included in the analysis, China is the last one to have introduced an AD law (in 1997). In Section 4.3.3 on robustness checks, we specifically address the case of China in order to verify that the results are robust to the choice of a more recent five-year period (so as to more accurately characterize the political-economy motivations of its government).

[28] The data supplied by Ludema and Mayda provide the number of trade associations by 4-digit HS code, which we aggregate at the 2-digit level by assigning to each 2-digit sector the maximum number of associations present in any 4-digit subsector—the idea being that any association operating in a specific 4-digit subsector should still be counted as operating in the corresponding 2-digit sector. If we were to add the number of associations present in all 4-digit subsectors of a given 2-digit sector, we would most likely be counting the same trade association multiple times.

[29] Due to data availability, these alternative proxies are only used as robustness checks (see Section 4.3.3 for details).

actions by other countries. As Figure 3 and the quantification exercise in Table 4 illustrate, two years seem to be the relevant time frame to consider for such actions. Hence, $X_{j,g,k,t/t-1}$ is equal to 1 (and 0 otherwise) if at least one AD measure in the same 4-digit HS sector k has been introduced within the period between t and $t-1$ (i.e., over the past two years) by the group of countries g against country j.[30] And considering the systematically different AD behavior of 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).[31] Our theoretical model predicts that only some countries will react to the AD actions of other countries, and these will be the intermediate-$\theta_{i,s}$ countries (as the "high"-$\theta_{i,s}$ countries will introduce measures independently of other countries' actions—with the highest-$\theta_{i,s}$ ones being the first to do so—while the "low"-$\theta_{i,s}$ ones will never introduce any measures). Therefore, the identification, along the lines of our model, of the political-economy channel leading to AD echoing would require that the linear term of the interaction term (i.e., $\theta_{i,s}X_{j,g,k,t/t-1}$) is positive and significant, while the squared one (i.e., $\theta_{i,s}^2X_{j,g,k,t/t-1}$) is also significant but presents a negative sign. Notice that the indicator variable $X_{j,g,k,t/t-1}$ by itself can capture other channels, not directly related to political-economy motivations, whereby the AD actions of one importing country affect protectionist measures in other countries (e.g., through conveying information on dumping behavior by specific exporters). Thus, it is important to emphasize that the key regressors for our analysis are the linear and squared interaction terms between past AD measures by third countries and the political-economy proxy.

The richness of our dataset allows us to use fixed effects to control for any time-bilateral variation between the trade partners (i.e., importing country $\times$ exporting country $\times$ year effects, $\alpha_{i\times j\times t}$) since the unit of analysis includes a sectoral dimension.[32] In this way, we

[30] Since Table 4 shows that the conditional probability of introducing AD measures is much higher when more than one AD measure has been previously introduced by other countries, we have experimented with a count version of $X_{j,g,k,t/t-1}$ (which takes though a value of 2 in very few cases). The results with this alternative formulation are basically identical to those reported in Table 5 (and are available upon request).

[31] The AD measures introduced by an importing country are not considered when constructing the $X_{j,g,k,t/t-1}$ variable used for that country. For example, the AD actions of the US are not considered in the construction of $X_{j,g,k,t/t-1}$ when g refers to the traditional users and the US is the importing country.

[32] Notice that importing country $\times$ year effects and exporting country $\times$ year effects are subsumed by the three-way fixed effects.

account for any bilateral and time-varying determinants of AD measures, including any potential macro-level determinants.[33] However, the benefit of controlling for any bilateral and time-varying effects, and thereby reducing the likelihood of omitted variable bias, comes at the cost of not being able to confirm previous results from the literature on the role of macro channels in countries' AD activity.

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. More specifically, the larger the import market share from a given exporter, the more likely for an industry to file an AD petition against that exporter and for the petition to be concluded with the imposition of measures. Furthermore, the WTO AD Agreement specifies that AD cases should be rejected when imports from a source country represent less than 3% of total imports of a good. Moreover, the growth rate of imports from a given country may be a relevant determinant of AD measures against that country since it can capture the extent of trade deflection induced by AD measures by other third countries. Considering that an investigation takes on average one year to reach its final stage, and that the authorities look at the trade statistics 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 Benchmark Results

Table 5 contains our benchmark results. Since the AD behavior 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 future AD use, we present our results splitting the sample into traditional and new users. The first two columns focus on the behavior of traditional users, while the last two columns look at the new users of AD. Furthermore, the difference between the first and second specification for each subsample is due to the inclusion of the trade variables. In light of the results of our theoretical model, we

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

should uncover a nonlinear effect of the political-economy proxy when interacted with the past imposition of AD measures by other countries (on the same product and against the same exporting country). This is what we see in all specifications with respect to the measures introduced by new users. For both groups of countries, for $\theta_{i,s} = 0$, the likelihood of an importing country introducing a new AD measure against a given exporting country is higher whenever a new user has introduced such a measure against the same exporting country in the same 4-digit HS sector (except in the last column). However, this effect is initially increasing but is then decreasing in the political-economy proxy $\theta_{i,s}$. While the results on the reaction to the past AD actions of new users are common between the two groups of countries, the results in columns (3) and (4) provide some indication that new users also respond to past actions of traditional users in a nonlinear way with respect to $\theta_{i,s}$. On the other hand, the result that traditional users do not echo the AD measures of other traditional users may seem counterintuitive at first. However, it may be due to a reputation effect that traditional users have long established. In such case, targeted exporters (by traditional users) may internalize the non-negligible probability that increased exports to other traditional users may lead to them facing (AD) protectionist measures also in those markets and thus, limit the extent of trade deflection. Furthermore, this conclusion seems to apply to the steel industry but not necessarily to other sectors, as shown by the analysis of sectoral effects in Section 4.3.2.

In order to provide a clearer interpretation of the results, Figure 4 depicts how traditional users react to the past imposition of measures by new users as a function of their $\theta_{i,s}$ (based on the specification in the first column of Table 5).[34] When $\theta_{i,s} = 0$, the effect equals the positive and significant coefficient of $X_{j,g,k,t/t-1}$. The effect becomes larger for positive values of $\theta_{i,s}$, but it starts declining when $\theta_{i,s} = 35$, implying that for such high values of the political-economy parameter, AD echoing between countries becomes less likely. However, this does not mean that sectors with a higher political-economy weight are less likely to get protected as the estimated effect of $\theta_{i,s}$ is positive and significant. To sum up, the figure clearly illustrates the nonlinear effect of the political-economy channel on traditional users' response to past AD measures by new users.[35] Similarly, Figure 5 provides analogous graphs for the new users

[34] Since we estimate linear probability models, we cannot calculate changes in predicted probabilities as such probabilities may lie outside the unit interval.

[35] We do not report the effect of the interaction of $\theta_{i,s}$ with past measures of traditional users because it is

(based on the specification in the third column of Table 5), which as we discussed above, echo the AD actions of both traditional and new users. Also in this case, AD echoing is more likely to occur for intermediate values of $\theta_{i,s}$.

As for the other regressors, the proxy variable $\theta_{i,s}$ is statistically significant and, as expected, presents a positive sign in all specifications, as sectors with higher values of $\theta_{i,s}$ are more likely to see the introduction of AD measures. For new users, also the squared term is significant, denoting a nonlinear effect (independently of any AD measures by third countries).

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 in countries' AD activity are quite similar. The only relevant difference is that the interaction term between past measures by traditional 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 0.12. As for the trade variables, the lagged trade share, as expected, presents a significant and positive effect in both specifications, whereas lagged trade growth is never significant.

These results are broadly consistent with our theoretical model, but they also highlight a potential difference between traditional and new users of AD. In particular, the political-economy channel has important ramifications for the response of traditional users to the past AD actions of new users, while there is some evidence that this channel is significant for new users with respect to their response to the AD measures introduced by both traditional and new users of AD.

4.3.2 Heterogeneous Effects and Other Determinants

The results in Table 5 demonstrate that AD measures by third countries and political-economy motivations jointly affect in a nonlinear way a country's decision to engage in AD echoing, as suggested by the theoretical model presented in Section 3. We now further delve into these results by pursuing two strategies. First, we examine the possibility of sectoral and country-level heterogeneous effects. Second, we augment our benchmark specifications to explicitly account for other known determinants of AD. Since some of these exercises do require the use

not statistically significant in column (1) of Table 5.

of the trade controls, we include them in all (reported) specifications henceforth.

In Table 6, we consider whether there are heterogeneous effects in the determinants of AD echoing. In particular, it is well known that the steel industry features predominantly in AD filings, as also illustrated by the summary statistics in Table 3. Therefore, in columns (1) and (3), we show the results when excluding the steel industry (i.e., HS sectors 72–83). The conclusions reached for traditional users change in that also the interaction terms between measures of traditional users and $\theta_{i,s}$ are significant, while this is not the case in the full sample. And also the new users now show a highly significant nonlinear response to the past measures of traditional users. Thus, although the steel sector is a major user of AD, it is not driving our results, but it hides heterogeneous sectoral effects regarding echoing. Another interesting dimension of heterogeneity to explore is whether the AD measures introduced by the largest and most intense users of AD may have more pronounced effects. To this end, in columns (2) and (4) of Table 6, we add interaction terms between the political-economy proxy and the measures introduced by Argentina, the EU, India, and the US. The results show that there is no "extra" significant effect for the measures introduced by these countries, while our previous results are overall robust (although for new users, the squared interaction term between past measures of other new users and the political-economy proxy is not statistically significant, as it is imprecisely estimated).

Although our theoretical model focuses on a particular political-economy channel to explain AD echoing, other (political-economy) channels may be at work. In Table 7, we explicitly take into account the role of retaliation: tit-for-tat AD retaliation as in Moore and Zanardi (2011), and the threat of retaliation à la Blonigen and Bown (2003). In particular, the variable $AD\ retaliation_{i,j,k,t-1}$ takes a value of 1 if trade partner j has introduced an AD measure against importing country i in sector k (4-digit HS level) in year $t-1$, and we would expect it to have a positive sign if tit-for-tat retaliation is at work. Instead, $Retaliation\ threat_{i,j,k,t-1}$ captures the exposure that industry k in importing country i has in trade partner j, which could retaliate with AD of its own. More precisely, $Retaliation\ threat_{i,j,k,t-1}$ measures the share of total 4-digit HS exports of the importing country i directed to the trade partner j in year $t-1$ (for trade partners with an AD law). As empirically verified by Blonigen and Bown (2003, page 257), "industr[ies] will be less likely to name import sources to which

they have significant export exposure." $Retaliation\ threat_{i,j,k,t-1}$ should therefore present a negative sign. The results when adding these two regressors to our specifications are reported in columns (1) and (3) of Table 7. The first observation is that the conclusions we reached previously on the response to the AD measures of traditional and new users are unchanged. In terms of the retaliation channels, we see that they do play some role but differently between the two samples. The threat of retaliation is a significant determinant of AD measures only for traditional users, while AD retaliation only matters for new users.

Columns (2) and (4) of Table 7 explore instead terms-of-trade motivations for the use of AD, which have been shown to play a role in AD activity (see Bown and Crowley, 2013b). We augment our specifications with $\text{Log}(1/export\ supply\ elasticity)_{i,k}$, which is the log of the inverse export supply elasticity importers face in a given 4-digit HS sector (i.e., the variable does not exhibit any time variation). Optimal tariff theory would predict a positive estimated coefficient for these (inverse) elasticities, which is what we find. More importantly, this added regressor does not modify the qualitative results for our key variables of interest (i.e., the interaction terms with the political-economy proxy). And notice that the results would not be qualitatively different if the two retaliation channels and the terms-of-trade motivations were all included in the same specification.

In conclusion, the qualitative findings from our benchmark regressions are robust to the consideration of other known determinants of AD, but there is evidence of sectoral differences for the empirical relevance of AD echoing.

4.3.3 Robustness Checks

We finally discuss a series of robustness checks to illustrate that the benchmark results are qualitatively unchanged when using different proxies for $\theta_{i,s}$ and different samples.

As discussed in Section 4.3, we may be concerned that our proxy for the political-economy channel is endogenous. To address this concern, the first four columns of Table 8 show that our results are robust when using employment levels or the count of trade associations as alternative proxies (always time invariant and measured at the 2-digit HS level). With either proxy, traditional and new users respond to the AD measures introduced by new users in a nonlinear way with respect to $\theta_{i,s}$. However, new users do not seem to react to past measures

by traditional users along the lines of our model, for which some evidence was found in Table 5. Notice that the reason why we choose to not use these regressors in our main analysis is that they suffer from data limitations. More specifically, employment data are not consistently available for all countries in our sample for the years we would want to use (e.g., the midpoint of our sample for China is 2001, but the earliest available data are for 2003; even for the US, the midpoint is 1993 but the earliest data are for 1998) and for some sectors, which leads to a reduction in the number of observations between Table 5 and Table 8. As for the data on trade associations, they are not available for China, South Africa, Taiwan, and Turkey, which represent an important part of the sample of new users and we do not want to exclude them from the main analysis. The last column of Table 8 exploits, instead, the long timespan of the sample of traditional users and uses the original political-economy proxy calculated over the years 1999–2003, while using only the period 1980–1998 for the estimation (i.e., the proxy is exogenous). The results confirm the previous findings on the sign and significance of the interaction terms between measures of new users and $\theta_{i,s}$. For this shorter period, though, it seems that traditional users also respond (in a nonlinear way) to the actions of other traditional users.[36] Thus, the results of Table 8 confirm that endogeneity does not seem to be a problem when using the original proxy for the political-economy channel.

In the last table, we consider alternative samples based on the trade controls. First, we may want to exclude observations for sectors in which there is no trade. In such case, AD measures cannot be introduced by definition. Columns (1) and (3) of Table 9 investigate what happens when dropping from the sample observations for which the trade share is equal to zero at time t, or $t-1$, or $t-2$.[37] As the table makes clear, there is no qualitative change to the results presented previously. Similarly, the results are robust to excluding those observations that are outliers in terms of trade growth, defined as the ones above the 99th percentile of the distribution (i.e., above 1,663% and 1,860% annual growth for traditional and new users, respectively). The results for those smaller subsamples are reported in columns (2) and (4) of Table 9.

[36] Notice that this result vanishes if we do not include trade controls and thus estimate the specification on a sample that is almost three-times as large (as the availability of trade data for the 1980s is limited).

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

We have also experimented with other robustness checks, which are not reported to save on space.[38] Hillberry and McCalman (forthcoming) show that a combination of (negative) demand and (positive) supply shocks determines which countries and products are targeted by AD petitions in the US, although the supply shock is relatively stronger for the named countries. Thus, we have tried interacting the political-economy proxy with the trade variables to capture the relevance of economic shocks and their interplay with political-economy pressures. The qualitative conclusions on the political-economy channel leading to AD echoing do not change as compared with the benchmark results in Table 5 (if anything, they are slightly stronger since the squared interaction term of the reaction of new users to traditional users is now significant at the 10% level). Among the added interaction terms, only the ones with the trade share have a consistently significant effect, implying that AD measures are more likely against exporting countries with larger import market shares and in sectors that are politically more powerful. In the case of new users, this effect is nonlinear and it decreases for sectors carrying a high political-economy weight.

Our conclusions on the role of the political-economy channel in AD echoing would also be unchanged if we were to use for each new user the most recent five-year period when data are available to calculate its $\theta_{i,s}$.[39] 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 might be the case that the Chinese government's preferences in supporting its industries were not completely revealed by the period 1999–2003, which is used in the benchmark analysis (although China started using this instrument soon after introducing its AD law).

Finally, we have also considered different samples where we have eliminated the weakest AD users among the traditional and new users. Considering the summary statistics presented in Table 2, we have excluded New Zealand from the set of traditional users, and Peru, South Korea and Taiwan from the group of new users. The results for these smaller sets of users are, again, qualitatively identical.

In brief, the various robustness checks confirm the validity of the results already observed in Table 5 from our benchmark specifications. AD echoing is the nonlinear result of domestic

[38] All results are available upon request.

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

political-economy pressures and AD activity by third countries.

5 Conclusions

This paper has documented the empirical relevance of AD echoing, whereby a given product exported by a given country becomes subject to AD measures in 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 as well as 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.

Given 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. In line with the literature on trade policy in general and on AD in particular, we have assumed that governments are politically motivated, attaching an extra weight to the profits of their domestic import-competing industry in their objective function. The results establish that echoing is much more likely to occur when the political-economy channel is strong, but not "too" strong. In fact, a government will introduce AD measures independently of the competing importer's actions if it cares a lot about its domestic industry. This conclusion is confirmed when considering the AD activity of the 15 most active users of AD. Although there are some differences in the results between traditional and new users of AD and we uncovered heterogenous sectoral effects, the econometric analysis provides robust evidence of the nonlinear effect on a country's AD activity of the interplay between its government's political-economy motivations and the AD measures previously introduced by other countries on the same products and against the same exporting countries as the ones currently targeted in its own AD investigations.

In conclusion, this paper highlights yet another peculiar feature of the AD system, shedding light on an important strategic effect that AD can give rise to. In particular, the political-economy-driven AD actions of different countries are shown to be interdependent (to some extent), implying that they cannot be fully understood when each importing country is an-

alyzed in isolation. Moreover, our findings suggest a novel political-economy explanation for the global proliferation of AD use over the last couple decades, highlighting a trade-deflection-based channel whereby AD activity might spread across countries, which was not previously studied in depth.

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Table 1: List of antidumping echoing cases

Product	(HS6)	Target country	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

THIS TABLE CONSISTS OF 7 PAGES; FULL VERSION AVAILABLE AS ONLINE APPENDIX ON CORRESPONDING AUTHOR'S WEBPAGE

Notes: Antidumping echoing cases identified when new measures are imposed within 5 years from previous ones and while the latter are still in force.

Table 2: Summary of AD initiations and measures (1980-2005)

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 and 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). See Table A in the appendix for the exact years included for each country.

Table 3: Summary of echoing cases (1980-2005)

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)	24.70%
Malaysia	0.85%	Philippines	0.87%	Articles of iron or steel	(73)	13.20%
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 and 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%					

Notes: See Table A in the appendix for the exact years included for each country.

Table 4: Quantifying AD echoing

	All users	Traditional users	New users
	(1)	(2)	(3)
Panel A: AD probabilities			
Prob($AD_{i,j,k,t}$)	0.024%	0.034%	0.018%
Prob($AD_{i,j,k,t}$ | at least 1 new AD measure against *j*, in *k*, in *t/t-1*)	0.721%	1.129%	0.493%
Prob($AD_{i,j,k,t}$ | at least 1 new AD measure against *j*, in *k*, in *t/t-2*)	0.636%	0.919%	0.479%
Prob($AD_{i,j,k,t}$ | at least 1 new AD measure against *j*, in *k*, in *t/t-3*)	0.582%	0.812%	0.457%
Prob($AD_{i,j,k,t}$ | at least 2 new AD measures against *j*, in *k*, in *t/t-1*)	1.639%	2.364%	1.144%
Prob($AD_{i,j,k,t}$ | at least 2 new AD measures against *j*, in *k*, in *t/t-2*)	1.256%	1.696%	1.030%
Prob($AD_{i,j,k,t}$ | at least 2 new AD measures against *j*, in *k*, in *t/t-3*)	1.252%	1.639%	1.051%
Observations	8,480,633	3,332,672	5,147,961
Panel B: Trade shares			
Trade $share_{i,j,k,t}$ when no AD measure introduced	2.599%	2.659%	2.565%
Trade $share_{i,j,k,t}$ when non-echoing (in *t/t-1*) AD measure introduced	13.409%	12.907%	13.689%
Trade $share_{i,j,k,t}$ when echoing (in *t/t-1*) AD measure introduced	11.653%	8.022%	13.675%
Trade $share_{i,j,k,t}$ when non-echoing (in *t/t-2*) AD measure introduced	13.461%	12.788%	13.836%
Trade $share_{i,j,k,t}$ when echoing (in *t/t-2*) AD measure introduced	11.630%	9.047%	13.069%
Trade $share_{i,j,k,t}$ when non-echoing (in *t/t-3*) AD measure introduced	13.269%	12.801%	13.529%
Trade $share_{i,j,k,t}$ when echoing (in *t/t-3*) AD measure introduced	12.465%	9.355%	14.196%
Observations	6,689,777	2,392,744	4,297,033

Notes: Probabilities calculated for the sample of countries included in the econometric analysis.

Table 5: Benchmark results

	Traditional users		New users	
	(1)	(2)	(3)	(4)
$\theta_{i,s}$	0.011***	0.016***	0.010***	0.014***
	(0.002)	(0.003)	(0.001)	(0.002)
$\theta_{i,s}^2$	0.003	-0.000	-0.011***	-0.017***
	(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$_{j,k,t/t-1}$	0.002	0.001	0.001	0.001
	(0.002)	(0.002)	(0.001)	(0.001)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.155	0.203**	0.085***	0.137***
	(0.099)	(0.089)	(0.030)	(0.050)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	0.066	-0.034	-0.103*	-0.145
	(0.140)	(0.128)	(0.053)	(0.092)
Measure by new users$_{j,k,t/t-1}$	0.001**	0.002**	0.001**	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.178***	0.168***	0.125***	0.139***
	(0.025)	(0.024)	(0.032)	(0.038)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	-0.254***	-0.236***	-0.132***	-0.116**
	(0.035)	(0.035)	(0.049)	(0.057)
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	0.013	0.017	0.035	0.038

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 importer X HS2 level) in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 6: Heterogeneous effects across sectors and countries

	Traditional users		New users	
	no steel		no steel	
	(1)	(2)	(3)	(4)
$\theta_{i,s}$	0.023***	0.015***	0.013***	0.014***
	(0.005)	(0.003)	(0.002)	(0.002)
$\theta_{i,s}^2$	-0.102***	0.001	-0.015***	-0.017***
	(0.033)	(0.004)	(0.004)	(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$_{j,k,t/t-1}$	0.001	0.005	0.000	0.001
	(0.002)	(0.005)	(0.001)	(0.002)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.919**	-0.136	0.473***	0.204**
	(0.356)	(0.244)	(0.142)	(0.103)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	-6.735***	0.396	-0.695***	-0.236
	(2.217)	(0.346)	(0.227)	(0.164)
Measure by new users$_{j,k,t/t-1}$	-0.000	0.002*	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.456***	0.144**	0.157***	0.129***
	(0.067)	(0.058)	(0.050)	(0.048)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	-2.250***	-0.237***	-0.144*	-0.100
	(0.475)	(0.088)	(0.076)	(0.074)
Measure by US$_{j,k,t/t-1}$		0.001		-0.002
		(0.006)		(0.002)
Measure by US$_{j,k,t/t-1}$ X $\theta_{i,s}$		0.058		-0.101
		(0.301)		(0.082)
Measure by US$_{j,k,t/t-1}$ X $\theta_{i,s}^2$		0.475		0.067
		(0.461)		(0.120)
Measure by EU$_{j,k,t/t-1}$		-0.001		0.003
		(0.005)		(0.003)
Measure by EU$_{j,k,t/t-1}$ X $\theta_{i,s}$		0.357		0.127
		(0.246)		(0.157)
Measure by EU$_{j,k,t/t-1}$ X $\theta_{i,s}^2$		-0.156		-0.137
		(0.364)		(0.237)
Measure by Argentina$_{j,k,t/t-1}$		-0.001		0.001
		(0.002)		(0.003)
Measure by Argentina$_{j,k,t/t-1}$ X $\theta_{i,s}$		0.056		0.048
		(0.126)		(0.134)
Measure by Argentina$_{j,k,t/t-1}$ X $\theta_{i,s}^2$		-0.025		-0.097
		(0.187)		(0.221)
Measure by India$_{j,k,t/t-1}$		0.001		-0.000
		(0.003)		(0.001)
Measure by India$_{j,k,t/t-1}$ X $\theta_{i,s}$		0.092		-0.194**
		(0.170)		(0.082)
Measure by India$_{j,k,t/t-1}$ X $\theta_{i,s}^2$		-0.122		1.020
		(0.242)		(0.676)
Importer X exporter X year effects	Yes	Yes	Yes	Yes
HS2 effects	Yes	Yes	Yes	Yes
Observations	1,538,149	1,767,940	2,588,870	2,977,760
R^2	0.0065	0.019	0.048	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 importer X HS2 level) in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 7: Other determinants

	Traditional users		New users	
	retaliation	ToT	retaliation	ToT
	(1)	(2)	(3)	(4)
$\theta_{i,s}$	0.016***	0.016***	0.014***	0.015***
	(0.003)	(0.003)	(0.002)	(0.002)
$\theta_{i,s}^2$	0.000	-0.000	-0.017***	-0.018***
	(0.004)	(0.004)	(0.003)	(0.004)
Trade share$_{i,j,k,t-2}$	0.003***	0.003***	0.003***	0.004***
	(0.001)	(0.001)	(0.000)	(0.001)
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$_{j,k,t/t-1}$	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.001)	(0.001)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.202**	0.204**	0.136***	0.138***
	(0.089)	(0.089)	(0.049)	(0.052)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	-0.036	-0.035	-0.147	-0.148
	(0.126)	(0.128)	(0.091)	(0.094)
Measure by new users$_{j,k,t/t-1}$	0.002**	0.002**	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.167***	0.167***	0.136***	0.135***
	(0.023)	(0.024)	(0.037)	(0.039)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	-0.234***	-0.233***	-0.112**	-0.109*
	(0.034)	(0.035)	(0.056)	(0.059)
AD retaliation$_{i,j,k,t-1}$	0.006		0.023***	
	(0.005)		(0.007)	
Retaliation threat$_{i,j,k,t-1}$	-0.001*		0.000	
	(0.001)		(0.000)	
Log(1/foreign export elasticity)$_{i,k}$		0.000*		0.000***
		(0.000)		(0.000)
Importer X exporter X year effects	Yes	Yes	Yes	Yes
HS2 effects	Yes	Yes	Yes	Yes
Observations	1,767,940	1,576,701	2,977,760	2,451,124
R^2	0.017	0.017	0.039	0.038

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 importer X HS2 level) in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 8: Benchmark results with alternative definitions of the political-economy parameter

	Traditional users		New users		Trad. users
	$\theta_{i,s}$ = empl	$\theta_{i,s}$ = assoc	$\theta_{i,s}$ = empl	$\theta_{i,s}$ = assoc	till 1998
	(1)	(2)	(3)	(4)	(5)
$\theta_{i,s}$	0.000	0.001	0.000	0.001	0.027***
	(0.000)	(0.001)	(0.000)	(0.002)	(0.007)
$\theta_{i,s}^2$	-0.000	-0.001	-0.000	-0.005	-0.026***
	(0.000)	(0.001)	(0.000)	(0.009)	(0.009)
Trade share$_{i,j,k,t-2}$	0.003***	0.003***	0.004***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Trade growth$_{i,j,k,t-2}$	0.000	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Measure by traditional users$_{j,k,t/t-1}$	0.014*	0.009	0.006***	0.007***	-0.003
	(0.008)	(0.009)	(0.002)	(0.002)	(0.004)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.000	0.200	0.000	0.197	0.437**
	(0.000)	(0.132)	(0.000)	(0.174)	(0.222)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	-0.000	-0.256	-0.000	-1.468	-0.581*
	(0.000)	(0.174)	(0.000)	(1.132)	(0.312)
Measure by new users$_{j,k,t/t-1}$	0.003***	0.003***	0.003***	0.002**	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.000***	0.047***	0.000**	0.173**	0.208***
	(0.000)	(0.014)	(0.000)	(0.071)	(0.056)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	-0.000***	-0.061***	-0.000**	-0.967**	-0.329***
	(0.000)	(0.021)	(0.000)	(0.438)	(0.085)
Importer X exporter X year effects	Yes	Yes	Yes	Yes	Yes
HS2 effects	Yes	Yes	Yes	Yes	Yes
Observations	1,735,241	1,767,940	2,752,253	1,899,153	854,956
R^2	0.008	0.009	0.038	0.048	0.012

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 importer X HS2 level) in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 9: Different samples

	Traditional users		New users	
	zero trade	outliers	zero trade	outliers
	(1)	(2)	(3)	(4)
$\theta_{i,s}$	0.028***	0.016***	0.035***	0.015***
	(0.008)	(0.003)	(0.005)	(0.002)
$\theta_{i,s}^2$	-0.005	-0.000	-0.036***	-0.017***
	(0.011)	(0.004)	(0.008)	(0.003)
Trade share$_{i,j,k,t-2}$	0.003***	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$_{j,k,t/t-1}$	0.002	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.001)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.185**	0.211**	0.193***	0.144***
	(0.082)	(0.090)	(0.074)	(0.052)
Measure by traditional users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	-0.021	-0.058	-0.251**	-0.157*
	(0.118)	(0.129)	(0.119)	(0.095)
Measure by new users$_{j,k,t/t-1}$	0.002**	0.002**	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}$	0.161***	0.161***	0.158***	0.134***
	(0.036)	(0.032)	(0.047)	(0.037)
Measure by new users$_{j,k,t/t-1}$ X $\theta_{i,s}^2$	-0.234***	-0.224***	-0.149**	-0.106*
	(0.051)	(0.045)	(0.070)	(0.056)
Importer X exporter X year effects	Yes	Yes	Yes	Yes
HS2 effects	Yes	Yes	Yes	Yes
Observations	727,344	1,735,759	812,996	2,922,981
R^2	0.018	0.016	0.051	0.035

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 importer X HS2 level) in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Figure 1: Two-phase, four-period game

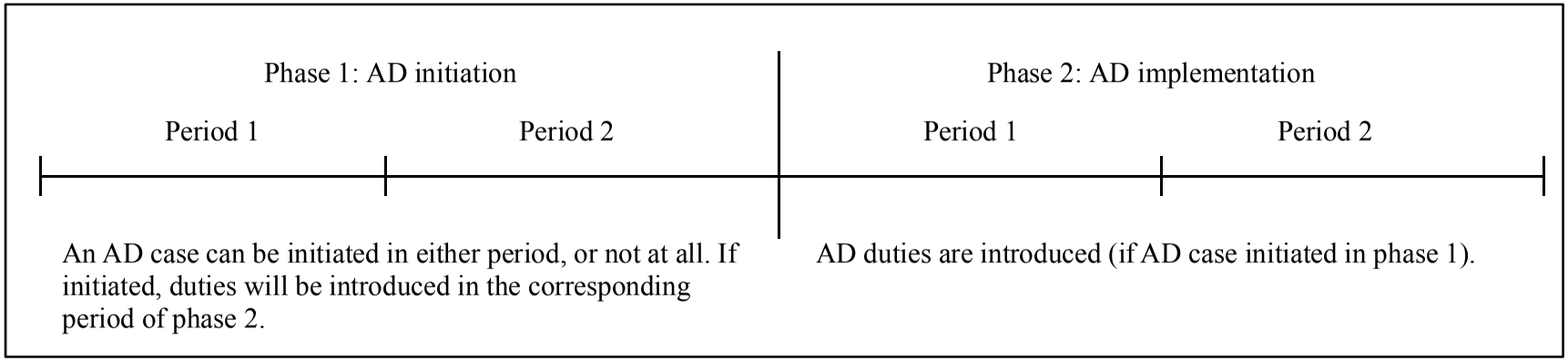


Figure 2: Equilibrium characterization

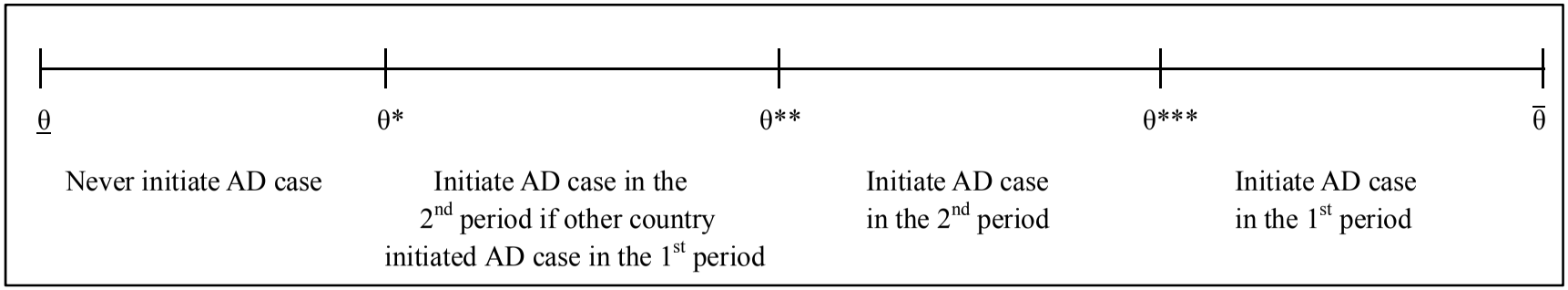


Figure 3: Days between impositions of AD measures in echoing cases

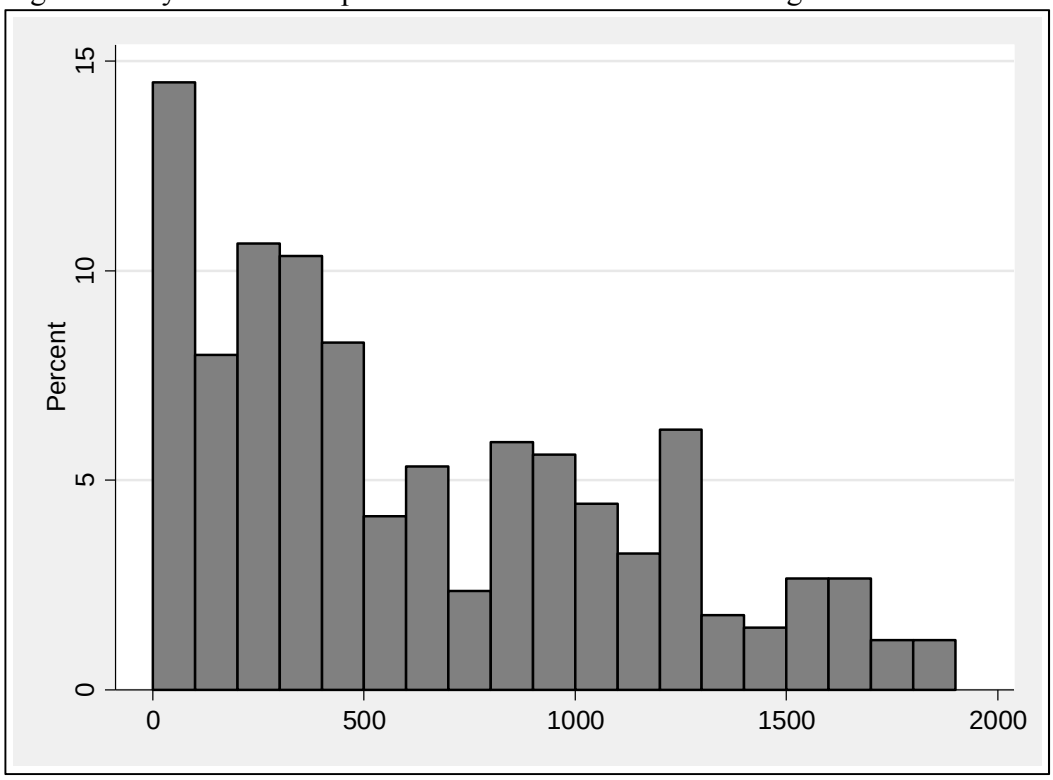
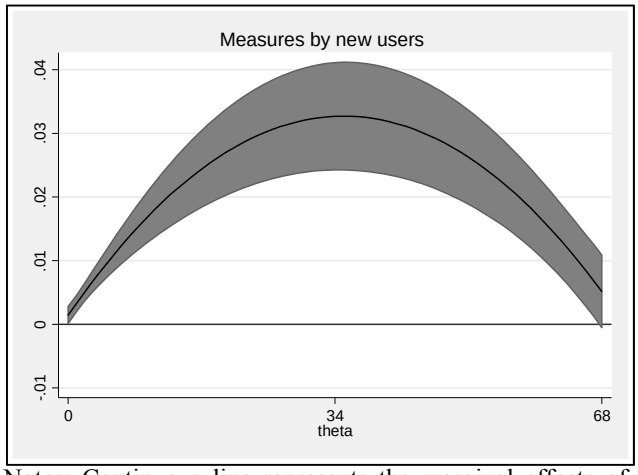
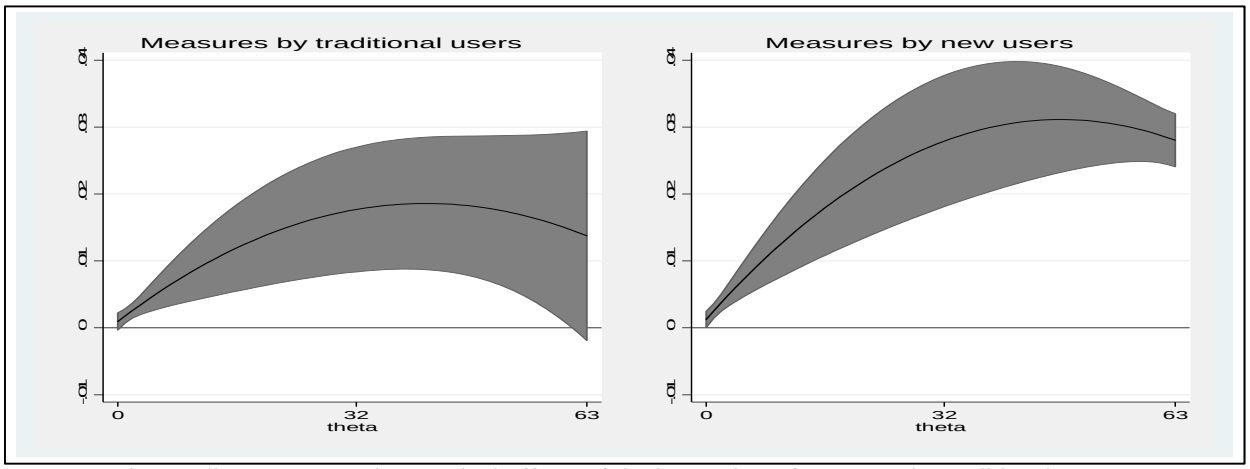


Figure 4: Effect of political-economy parameter and past AD measures for traditional users



Notes: Continuous line represents the marginal effects of the interaction of 'Measure by new users' and the political-economy parameter (based on column (1) of Table 5); the shaded area represents the 95% confidence interval of point estimates.

Figure 5: Effect of political-economy parameter and past AD measures for new users



Notes: Continuous lines represent the marginal effects of the interaction of 'Measure by traditional users' or 'Measure by new users' and the political-economy parameter (based on column (3) of Table 5); the shaded areas represent the 95% confidence interval of point estimates.

Table A: Sample and sources for AD 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).