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## Trade Liberalization, Macroeconomic Fluctuations, and Contingent Protection in Latin America

Latin America has pursued very aggressive trade liberalization policies since the mid-1980s. Both tariff and nontariff barriers have declined significantly as a result. This process of trade liberalization was not reversed even during the strong macroeconomic shocks that affected the region in the mid-1990s (the so-called tequila crisis), the late 1990s (the Brazilian devaluation), and 2001–02 (the Argentine devaluation).<sup>1</sup> As expected, the move toward trade liberalization was accompanied by a strong surge of trade flows. This increased the pressure on local producers, which must now compete with worldwide imports in domestic markets. Governments in the region thus faced renewed demands for some type of import-relief measures. Authorities responded by implementing contingent protection, in particular, antidumping actions.<sup>2</sup>

The application of antidumping measures is governed by specific rules whose main principles are established in the World Trade Organization (WTO) Anti-dumping Agreement. This allows governments to impose these measures if it is determined, after an investigation conducted in accordance with this agreement, that dumping is occurring, that the domestic industry producing the similar

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1. Argentina did raise tariffs against non-Mercosur countries to 35 percent for final consumption products in 2001, but these import duties were back at their pre-2001 values at the end of 2002. For more details, see Lederman and Sanguinetti (2004).

2. Contingent protection also includes countervailing and safeguard measures, but countries in the region seldom apply these other two instruments.

product in the importing country is suffering injury, and that there is a causal link between the dumping and the injury. Under this normative approach, anti-dumping actions should be associated with episodes of depressed economic activity or real exchange rate appreciations (or both), given that these developments favor the finding of industry injury or dumping practices and thus make the case for trade remedy measures easier to justify.

An alternative hypothesis is that these policies simply represent another form of protection that eventually replaces the protection inherent in tariff levels. Their prevalence thus depends on factors related to lobbying activity, which could also be stronger in times of adverse macroeconomic conditions. If this were the main driving force, antidumping measures and tariff levels would display a negative relation, and contingent protection should be responsive to political economy variables such as industry concentration.

The main purpose of this study is to investigate the above hypotheses for Latin America. We start by presenting an updated description of the use of anti-dumping actions in this region since the late 1980s. We identify the number of antidumping investigations initiated each year, the number of these investigations that led to the imposition of import duties, the sectors involved, and the exporting countries subject to these measures. We show that Argentina, Brazil, and Mexico are the main users in Latin America, with more than 80 percent of all cases (85 percent of definitive measures). Among the subject countries, Brazil and China are important for Argentina, while the United States and China are the main affected nations in the case of Brazil. In Mexico, the United States accounts for almost 30 percent of initiations, followed by China with 14 percent. We find a clear pattern of sectoral concentration of antidumping measures: chemicals and basic metals are antidumping-intensive industries in all three countries, and Argentina also exhibits significant antidumping activity in metal products, machinery and equipment, and engines and electrical equipment.

We then explore the relation between the implementation of these actions and the behavior of key macroeconomic variables, such as the level of economic activity and the real exchange rate. Several authors use regression analysis to study this relation empirically for developed countries.<sup>3</sup> Niels provides one of the few studies of a developing economy in his research on Mexico.<sup>4</sup> We extend his analysis on various dimensions. First, we include Argentina and Brazil in our sample. Second, we exploit the bilateral variability observed both in the depen-

3. See Leidy (1996); Feinberg (1989, 2003); Knetter and Prusa (2003).

4. Niels (2001).

dent variable (that is, antidumping actions are defined as country pairs) and in some of the explanatory variables (namely, the bilateral real exchange rate) to empirically identify the response of antidumping initiations to the variables of interest. Third, we incorporate industry-sector variability in the data: the dependent variable varies not only across subject countries, but also across sectors defined in terms of two-digit activities of the International Standard Industrial Classification (ISIC). This allows us to examine whether industry-specific factors are also a determinant of antidumping filing. Our estimates of macroeconomic factors thus are not contaminated by industry-specific determinants.

We find support for the hypothesis that Argentina, Brazil, and Mexico have used contingent protection to help domestic industries in times of macroeconomic hardship. In particular, real exchange rate appreciations and sluggish growth of gross domestic product (GDP) are associated with increasing use of antidumping actions. The estimated quantitative impact seems quite significant: on average, a 25 percent real appreciation raises expected antidumping initiations by about 20 percent, and a 4 percent decline in GDP raises expected antidumping activity by 27 percent. When we allow the response to vary by country, we find very strong and significant results for Argentina. The results are much weaker for Brazil (only lagged GDP seems to have an effect on antidumping initiation). Mexico holds a middle position in which real exchange rate fluctuations (contemporary and lagged) have a significant and positive impact on antidumping actions, but GDP fluctuations have weaker effect.

Finally, we test the alternative hypothesis of whether antidumping measures were established as a mechanism for replacing the protection provided by regular tariffs or whether these policies were determined by political economy variables, such as industry concentration. We find some evidence suggesting that lower tariffs have been associated with increasing antidumping cases. This finding, however, does not weaken the association of contingent protection with the macroeconomic variables. Concentration indicators, on the other hand, do not seem to be relevant in the determination of antidumping measures (once we control by industry fixed effects).

The next section provides a short description of the trade liberalization contexts in which the main antidumping users in Latin America adopted these regulations, while the subsequent section compares antidumping activity by Latin American countries with antidumping activity worldwide. The paper then presents a more detailed analysis of antidumping policies followed by Argentina, Brazil, and Mexico. We also provide an analysis of the macroeconomic determinants of antidumping actions in these three countries. The final section concludes.

## Trade Liberalization and Antidumping Legislation in Latin America

Antidumping legislation has proliferated in the last fifteen years and is now being used extensively by both developed and developing countries. Antidumping measures have spread from a few traditional users, such as Australia, Canada, the European Union, New Zealand, and the United States, to a growing group of new users, including Latin American countries, India, Korea, South Africa, and Turkey. As shown in the next section, antidumping activity in Latin America is mainly explained by Argentina, Brazil, and Mexico. Many authors relate the increasing use of antidumping practices by developing countries, especially in Latin America, to the fact that these economies liberalized their trade regimes in the last two decades. Miranda, Torres, and Ruiz, for example, suggest that economies evolving from a controlled to a more liberal trading regime, particularly those opening up unilaterally, tend to use antidumping legislation very heavily.<sup>5</sup>

The literature interprets the increasing use of antidumping practices by developing countries in two opposing ways. On the one hand, it is considered a backdoor escape from trade liberalization that is inconsistent with the objective of enhancing economic welfare, since these rules affect a much broader array of trade practices than those that are harmful to competition and consumers, such as predatory dumping. On the other hand, it is viewed as the price to be paid for increased trade liberalization or, as Niels states, the “sweetener” for emerging economies that set out on the path to trade liberalization.<sup>6</sup> Abolishing import barriers is easier to sell politically when domestic industries are offered a shield from “unfair” imports under the antidumping rules. In other words, there would be less trade liberalization in the absence of antidumping practices, and the potential protectionist effects of antidumping measures are a necessary cost of moving toward free trade.

How, then, does the antidumping legal framework in Latin American countries relate to trade liberalization experiences? To answer that question, we examine the cases of Argentina, Brazil, and Mexico, leading users of these trade remedy practices that unilaterally undertook massive trade liberalization in the late 1980s and early 1990s. The three countries adopted antidumping regulations at the beginning of their trade liberalization efforts, although they later modified the regulations in several ways, including reforming the government agencies that administer these policies.

5. Miranda, Torres, and Ruiz (1998).

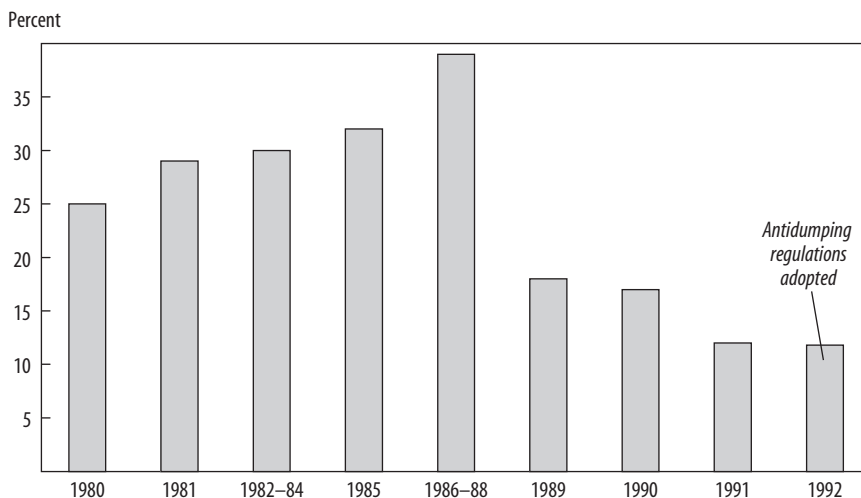
6. Niels (2001).

Trade liberalization in Argentina started in the late 1980s and was completed in the first half of the 1990s, with a significant reduction in tariffs and the removal of most nontariff barriers (mainly import licenses). The implementation of the Southern Common Market (Mercosur) in 1995 reinforced the country's unilateral tariff liberalization. Argentina passed antidumping regulations in September 1992, when Law 24,176 incorporated the Tokyo Round Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade (GATT). This law became operational in 1994 with the administrative provisions issued by Decree 2,121.<sup>7</sup> In December 1994, Argentina adopted the Uruguay Round Agreements in Law 24,425, while Decree 1,326 of 1998 established the administrative provisions for applying the Uruguay Round Antidumping Agreement.

Brazil signed the Tokyo Round Antidumping Code in 1987, promulgating national antidumping legislation in the same year (Decree 93,941 of January 1987), together with administrative provisions (Resolution 1,227 of June 1987). Nevertheless, high tariffs and the existence of important nontariff barriers made the use of antidumping regulations unnecessary. The trade liberalization process began in 1988 and deepened in 1990–93, with the reduction of tariffs and the dismantling of prohibitions and other administrative restrictions. Antidumping activity rose substantially in this period. It increased again in 1996–99, when the exchange rate declined during the implementation of a new economic program (called the *Plan Real*). In March 1995, Brazil adopted the Uruguay Round Antidumping Agreement through Decree 1,602.

Mexico began its liberalization process in 1985, when it radically broke with previous import substitution policies and slashed both tariff and nontariff import barriers, mainly import permits. In 1986 Mexico joined GATT and adopted antidumping law, initiating its first investigation in February 1987. The antidumping rules were laid out in the Unfair Trade Practices Regulations of 1986 and enforced by the Ministry of Trade and Industry (then the Ministry of Economy). Mexico adopted the Antidumping Code of the Tokyo Round in 1988. The legal framework was modified in 1993: antidumping rules were included in the Foreign Trade Law, published in July 1993, and further set out in the Foreign Trade Law Regulations, published in December 1993. Almost half of the antidumping investigations initiated by Mexico were concentrated in 1992–94. Economic reform and trade liberalization were intense

7. Though antidumping regulations existed from 1981 through Law 22,415, they were rarely used.

**FIGURE 1. Argentina: Average Tariff and Antidumping Rules**

Source: Authors' elaboration.

in this period and included the implementation of the North American Free Trade Agreement (NAFTA).

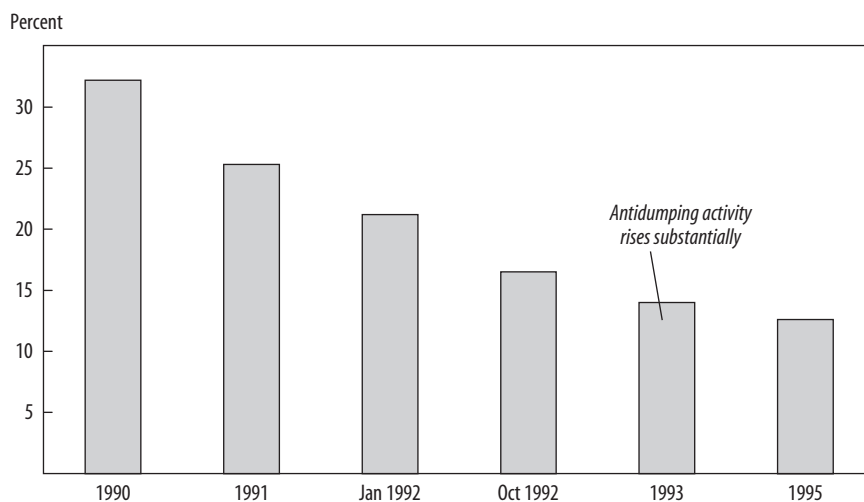
Figures 1 to 3 show the magnitude of the unilateral trade liberalization (tariffs) efforts taken by each of the three countries at the beginning of the 1990s. They highlight how the establishment of the antidumping mechanism coincides with the period when tariffs reached very low levels in the three economies. The next two sections analyze the use of antidumping action in more detail.

### The Use of Antidumping Actions by Latin American Countries

We begin this section by defining dumping in the context of international trade and briefly describing the WTO Antidumping Agreement.<sup>8</sup> A company is said to be dumping a product if it exports that product at a lower price than it normally charges in its own home market (that is, below the product's normal value). The WTO Antidumping Agreement (formally known as the Agreement on the Implementation of Article VI of the General Agreement on Tariffs and

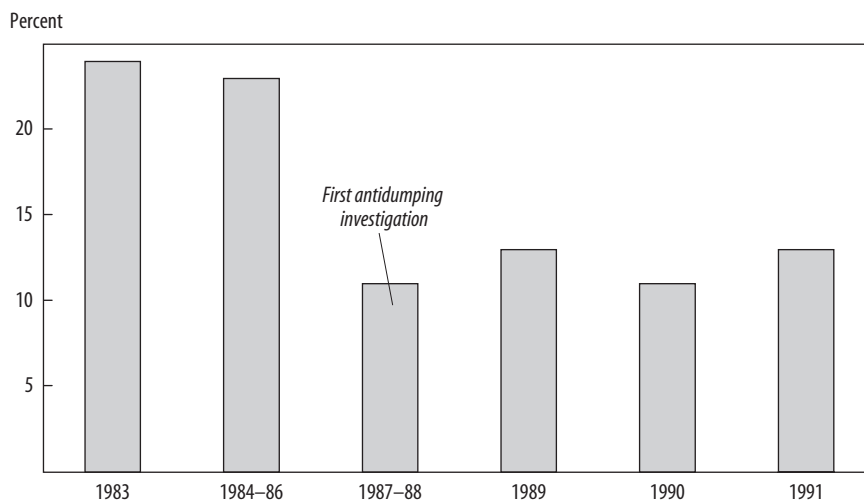
8. See the appendix for more information on the Antidumping Agreement.

**FIGURE 2. Brazil: Average Tariff and Antidumping Rules**



Source: Authors' elaboration.

**FIGURE 3. Mexico: Average Tariff and Antidumping Rules**



Source: Authors' elaboration.

**TABLE 1. Antidumping Initiations by Country Group, 1987–2003**

Country group	1987–89		1990–94		1995–2003		1987–2003	
	No. initiations	Percent	No. initiations	Percent	No. initiations	Percent	No. initiations	Percent
Traditional users	280	82	832	67	869	42	1,981	54
Latin America	38	11	280	22	468	22	786	21
Other new users	2	1	78	6	578	28	658	18
Other countries	20	6	56	4	172	8	248	7
Total	340	100	1,246	100	2,087	100	3,673	100

Source: Authors elaboration based on data from Miranda, Torres, and Ruiz (1998) and World Trade Organization (WTO), *Annual Reports* (various years).

Trade 1994) allows governments to impose antidumping measures if it is determined, following an investigation conducted in accordance with this agreement, that dumping is occurring, that the domestic industry producing the similar product in the importing country is suffering injury, and that there is a causal link between the dumping and the injury. The agreement defines the term injury as material injury to a domestic industry, the threat of material injury to a domestic industry, or material retardation of the establishment of a domestic industry.

There are many different ways to calculate whether a particular product is being dumped. The Antidumping Agreement provides three methods for calculating a product's normal value. The main method is based on the price in the exporter's domestic market. When this cannot be used, two alternatives are available: the price charged by the exporter in another country, or a calculation based on the combination of the exporter's production costs, other expenses, and normal profit margins. The Antidumping Agreement also specifies how to fairly compare the export price and the normal price. As for the injury test, the investigation must evaluate all relevant economic factors that have a bearing on the state of the industry in question.

Table 1 shows the number of antidumping initiations by country groups for the period 1987–2003.<sup>9</sup> The four groups considered in the table are defined as follows: traditional users, including Australia, Canada, the European Union, New Zealand, and the United States, have actively engaged in antidumping activ-

9. Data were compiled from Miranda, Torres, and Ruiz (1998) for 1987–1997 and from WTO Annual Reports for 1998–2003.



ities since the 1970s; Latin America includes all the countries of the region that initiated at least one investigation during this period (namely, Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Nicaragua, Panama, Peru, Uruguay, and Venezuela); other new users are countries outside Latin America that were important users of antidumping rules in the period (including India, Korea, South Africa, and Turkey); and other countries represent any other country that initiated at least one investigation in these years. To properly analyze the evolution of antidumping initiations over the last seventeen years, we divided the period into the years before and after the Uruguay Round Agreements (including the Antidumping Agreement), which went into force on January 1, 1995; the period before the Uruguay Round implementation is further broken down into the years before and after antidumping activity began in most Latin American countries.

Table 1 clearly shows that the number of cases initiated by Latin American countries increased substantially over time, both in absolute terms and relative to the world total. In 1987–89, traditional users initiated 280 antidumping cases (82 percent of total), while Latin American countries opened thirty-eight cases (11 percent of total). Mexico accounts for thirty-six of these initiations, as it was the first Latin American country to actively use antidumping regulations. In the five years prior to the Uruguay Round Agreements (1990–94), Latin American countries increased their use of antidumping practices relative to traditional users; Latin America's share in antidumping initiations jumps to 22 percent (280 cases), whereas the share of traditional users declines to 67 percent (832 cases). The countries included as other new users also become relevant in this period, accounting for 6 percent of total antidumping initiations. After the Uruguay Round Agreements, Latin American countries and other new users jointly surpass the share of traditional users (50 percent of antidumping initiations for the first two groups versus 42 percent for traditional).

Table 2 identifies which Latin American countries account for this important rise in antidumping initiations. In the first subperiod, Mexico was the main Latin American country that launched antidumping cases (95 percent of total), while in the five years prior to the Uruguay Round Agreements, Argentina and Brazil joined Mexico as important initiators of antidumping investigations. Together, these three countries account for 92 percent of antidumping cases. In 1995–2003, the three countries continued to account for almost 75 percent of antidumping initiations in Latin America, although Argentina surpasses Mexico and Brazil in terms of the number of cases launched. New Latin American users appear in this subperiod, including Chile, Colombia, Peru, and Venezuela. For the whole 1987–2003 period, Argentina and Mexico present almost the

**TABLE 2. Antidumping Initiations by Latin American country, 1987–2003**

Reporting country	1987–89		1990–94		1995–2003		1987–2003	
	No. initiations	Percent	No. initiations	Percent	No. initiations	Percent	No. initiations	Percent
Argentina	0	0	59	21	180	38	239	30
Brazil	2	5	61	22	104	22	167	21
Chile	0	0	2	1	14	3	16	2
Colombia	0	0	14	5	23	5	37	5
Costa Rica	0	0	0	0	6	1	6	1
Ecuador	0	0	0	0	1	0	1	0
Guatemala	0	0	0	0	1	0	1	0
Mexico	36	95	138	49	63	13	237	30
Nicaragua	0	0	0	0	2	0	2	0
Panama	0	0	0	0	2	0	2	0
Peru	0	0	3	1	43	9	46	6
Uruguay	0	0	0	0	5	1	5	1
Venezuela	0	0	3	1	24	5	27	3
Total	38	100	280	100	468	100	786	100

Source: Authors' elaboration based on data from Miranda, Torres, and Ruiz (1998) and WTO, *Annual Reports* (various years).

same number of antidumping initiations, with a 30 percent share each, while Brazil accounts for 21 percent.<sup>10</sup>

In summary, the evidence shows increasing antidumping activity in Latin America during the sample period. This activity was concentrated mostly in Argentina, Brazil, and Mexico, which represent 81 percent of Latin American antidumping initiations and 85 percent of Latin American definitive antidumping measures (around 20 percent of the world total in both categories). This performance is particularly remarkable considering that Latin American countries began to use antidumping rules only in the late 1980s, whereas the traditional users have been applying them actively since the 1970s.

10. A similar picture arises when we consider definitive antidumping measures instead of initiations. Through 1989, traditional users were almost exclusively the countries that imposed definitive antidumping measures, accounting for 90 percent of the total. Nevertheless, Latin American countries increased their share of total definitive antidumping measures in the five years prior to the Uruguay Round Agreements, with 17 percent in 1990–94 and 23 percent in 1995–2003. The increasing use of these measures, by both Latin American countries and other new users, and the decreasing use by traditional users implied that the share of this last group of countries decreased to 39 percent in the last nine years of the sample. Within Latin America, Argentina, Brazil, and Mexico account for 85 percent of the definitive measures adopted in the whole period. Argentina imposed the most measures—particularly in the last nine years, when it adopted more definitive measures than Brazil and Mexico combined, to reach almost 50 percent of the Latin American total.

## Antidumping Activity in Argentina, Brazil, and Mexico

As explained in the previous section, antidumping activity in Latin America is mainly undertaken by Argentina, Brazil, and Mexico. Before presenting more detailed information on antidumping actions in these economies, we describe the main features of their antidumping regimes. Their regulations closely follow the WTO Antidumping Agreement, since all three countries are WTO members. Nonetheless, the countries display some degree of institutional variation that could potentially influence the way these rules are applied.

### *Antidumping Institutional Setting*

Argentina has a bifurcated antidumping system, in which the National Commission for Foreign Trade (CNCE) is in charge of the injury and causal link determinations and the Undersecretariat of Trade Policy assesses the dumping margin. Both agencies are part of the Secretariat of Industry, Trade, and Small and Medium-Sized Enterprises, which belongs to the Ministry of Economy and Production. Argentina generally does not apply antidumping measures in the form of an ad valorem duty; instead, antidumping measures take the form of minimum export prices, with duties being equal to the difference between the declared F.O.B. export value and the minimum export price. The minimum export prices are F.O.B. prices, corresponding to either the normal value or noninjurious export prices, set by the authorities. Antidumping measures are usually imposed for two or three years, and often the principle of lesser duty is applied—that is, the effective antidumping measure established to eliminate injury could be lower than the margin of dumping. The Minister of Economy and Production can deny the imposition of antidumping measures despite positive dumping, injury, and causality determinations, based on national interest.

Brazil, in turn, has a unified antidumping system, since the dumping and the injury and causal tests are both performed by the Trade Defense Department (DECOM), which pertains to the Foreign Trade Secretary (SECEX) of the Ministry of Development, Industry, and Trade. The antidumping duties applied are mostly ad valorem, and their duration is often for periods of less than five years. Brazilian antidumping authorities also apply the lesser duty rule, and the national interest clause may be invoked to suspend the imposition of antidumping duties or the application of duties lower than the dumping margin. Antidumping legislation explicitly asks DECOM to exclude from the injury test the impact of the trade liberalization process on domestic prices, provided that these effects were not caused by the dumped imports.

In the case of Mexico, the administration of the antidumping system is entrusted to one agency, the International Trade Practices Unit (UPCI), which is a specialized unit within the Secretary of Commerce and Industrial Promotion (SECOFI) of the Ministry of Economy. The UPCI is responsible for determinations on dumping, injury, and causal link. Mexico imposes antidumping measures in the form of ad valorem duties, using specific duties in some cases. Like Argentina and Brazil, Mexico applies the lesser duty rule, although it uses the undistorted international price as the reference price.<sup>11</sup> National interest is also considered to determine the imposition of antidumping measures; antidumping duties are generally applied for shorter periods than the maximum allowed (five years).

### *Quantitative Analysis of Antidumping Actions in Argentina, Brazil, and Mexico*

We previously presented some quantitative indicators of antidumping activity in Latin American countries, which demonstrated that Argentina, Brazil, and Mexico are the main antidumping users. Additional information is needed, however, to gain insight into the ultimate motives and determinants of these policies. For example, we would like to know which countries were most affected by these actions and whether the sectoral pattern of antidumping measures across industries was concentrated or dispersed. To perform this analysis, we changed our data source, replacing the aggregate WTO data used in the previous section with information gathered from official sources in each country. For Argentina, we drew on various annual reports of the National Foreign Trade Commission (CNCE); for Brazil, various reports of *Relatorio DECOM* (a publication of the Department of Trade Defense); and for Mexico, the International Trade Practices Information System (maintained by the International Trade Practices Unit of the Ministry of Economy).<sup>12</sup>

Table 3 shows the number of antidumping initiations by each country for the period 1987–2003. Although Argentina implemented antidumping rules later than Brazil, the number of initiations is much higher, at 216 and 162, respec-

11. If the undistorted international price is equal to the normal value and there is dumping, an antidumping duty equal to the dumping margin is applied; if it is equal to the export price, no antidumping duty is imposed; and if the undistorted international price is greater than the export price, an antidumping duty is imposed to make them equal.

12. For this analysis and the empirical tests performed in the following sections, we constructed a database for each country, taking the product-country pair as the unit of observation. For example, if an investigation initiated for a given product covers imports from two countries, we consider it to be two investigations. This is the usual methodology when studying antidumping activity.

**TABLE 3. Number of Antidumping Initiations by Argentina, Brazil, and Mexico, 1987–2003**

<i>Year</i>	<i>Argentina</i>	<i>Brazil</i>	<i>Mexico</i>
1987	0	0	18
1988	0	4	11
1989	0	0	7
1990	0	2	11
1991	1	9	9
1992	8	8	26
1993	32	27	55
1994	15	11	23
1995	27	5	5
1996	23	18	4
1997	15	9	6
1998	5	16	10
1999	20	15	11
2000	33	9	5
2001	26	17	5
2002	10	8	11
2003	1	4	11
Total	216	162	228

Source: Authors' elaboration based on data from the Argentine National Foreign Trade Commission (CNCE), the Brazilian Department of Trade Defense (DECOM), and the Mexican Ministry of Economy (SEM).

tively, and close to Mexico's.<sup>13</sup> Antidumping initiations in Argentina are concentrated, first, in 1993–96, following the trade liberalization program and coinciding with the launch of Mercosur, and, second, in 1999–2001, when macroeconomic conditions were dominated by recession and overvaluation of the domestic currency.<sup>14</sup> In the case of Brazil, antidumping initiations occur mainly in 1993–94, when the liberalization process deepened, and in 1996–99, when the exchange rate declined during the implementation of a new economic program. In the case of Mexico, antidumping actions were already established by the late 1980s; this is associated with the fact that Mexico implemented its unilateral trade liberalization policy early (in 1986).

Table 4 breaks down the antidumping initiations by affected countries. Argentina primarily initiated antidumping actions against Brazil (22 percent of total) and China (17 percent of total); these countries, together with Korea

13. The totals in table 3 are not the same as those in table 2, since the data sources differ. A worldwide comparison requires WTO data, while for a small subset of countries more complete information can be obtained from national sources.

14. We formally investigate the role of GDP fluctuations and real exchange rate movements in antidumping activity in Argentina, as well as in Brazil and Mexico, later in the paper.

**TABLE 4. Antidumping Initiations by Argentina, Brazil, and Mexico, 1987–2003: Subject Countries**

Country <sup>a</sup>	Argentina		Brazil		Mexico	
	No. initiations	Share	No. initiations	Share	No. initiations	Share
Argentina	...	...	3	2	1	0.4
Brazil	47	22	...	...	20	9
Canada	0	0	3	2	5	2
Chile	6	3	3	2	1	0.4
China	37	17	20	12	32	14
Colombia	1	0.5	1	1	4	2
France	0	0	4	2	1	0
Germany	8	4	3	2	7	3
India	4	2	6	4	2	1
Italy	5	2	2	1	0	0
Japan	4	2	2	1	3	1
Korea	13	6	4	2	9	4
Mexico	2	1	4	2	...	...
Russian Federation	3	1	7	4	8	4
South Africa	10	5	4	2	1	0
Spain	8	4	5	3	7	3
Taiwan	8	4	2	1	6	3
Ukraine	2	1	4	2	6	3
United Kingdom	2	1	4	2	0	0
United States	12	6	29	18	66	29
Venezuela	2	1	3	2	8	4
Other	42	21	49	30	41	18
Total	216	100	162	100	228	100

Source: Authors' elaboration based on data from CNCE, DECOM, and SEM (see table 1).

... Not applicable.

a. The listed subject countries were affected by four or more initiations in any of the three antidumping users considered.

(6 percent) and the United States (6 percent), explain half of Argentina's antidumping initiations. For Brazil, the main countries affected are the United States (18 percent of total) and China (12 percent of total), although seven other countries are needed to jointly reach 50 percent of total antidumping initiations. In the case of Mexico, 50 percent of antidumping initiations are explained by the United States (29 percent), China (14 percent), and Brazil (9 percent). Argentina and Mexico thus display a geographically concentrated pattern of antidumping initiations, while Brazil presents a more dispersed pattern. An important share of Argentina's antidumping initiations are against other Latin American countries (30 percent of total), mainly Brazil, while for Mexico the most affected country is the United States. Argentina and Mexico have clearly used this mechanism to moderate the potential negative effects of Mercosur

**TABLE 5. Antidumping Initiations by Argentina, Brazil, and Mexico, 1987–2003: Industry Composition**

<i>ISIC group</i>	<i>Argentina</i>		<i>Brazil</i>		<i>Mexico</i>	
	<i>No. initiations</i>	<i>Share</i>	<i>No. initiations</i>	<i>Share</i>	<i>No. initiations</i>	<i>Share</i>
Agriculture, hunting and forestry	0	0.0	6	3.7	2	0.9
Mining and quarrying	1	0.5	0	0.0	1	0.4
Manufacture of food products and beverages	6	2.8	8	4.9	10	4.4
Manufacture of textiles	6	2.8	4	2.5	13	5.7
Manufacture of wearing apparel	3	1.4	0	0.0	0	0.0
Manufacture of wood	4	1.9	0	0.0	0	0.0
Manufacture of paper and paper products	12	5.6	2	1.2	7	3.1
Manufacture of coke and refined petroleum products	1	0.5	0	0.0	0	0.0
Manufacture of chemicals and chemical products	30	13.9	70	43.2	63	27.6
Manufacture of rubber and plastics products	11	5.1	10	6.2	11	4.8
Manufacture of other non-metallic mineral products	7	3.2	7	4.3	8	3.5
Manufacture of basic metals	48	22.2	37	22.8	76	33.3
Manufacture of fabricated metal products	18	8.3	6	3.7	9	3.9
Manufacture of machinery and equipment	19	8.8	6	3.7	5	2.2
Manufacture of electrical machinery and apparatus	26	12.0	1	0.6	7	3.1
Manufacture of medical instruments, watches and clocks	6	2.8	1	0.6	3	1.3
Manufacture of furniture	10	4.6	3	1.9	8	3.5
Other manufacture	8	3.7	1	0.6	5	2.2
Total	216	100.0	162	100.0	228	100.0

Source: Authors' elaboration based on data from CNCE, DECOM, and SEM (see table 1).

and NAFTA, respectively, on import-competing industries.<sup>15</sup> In contrast, Brazil did not show a Mercosur bias in its antidumping use.

Table 5 explores which products were most subject to these measures, using the ISIC classification. Most of the antidumping initiations in the three Latin American countries occurred in steel and chemical products: for Argentina, 22 percent and 14 percent, respectively; for Brazil, 23 percent and 43 percent; and for Mexico, 33 percent and 28 percent. In the case of Argentina, antidumping initiations involving electrical machinery and appliances were also significant (14 percent). Given this common pattern in the industries that are

15. Brazil is not the main subject country for Argentina based on the ratio of imports affected by antidumping actions over total imports. According to that measure, China is by far the most affected country (see Sanguinetti and Salustro, 2001).

subject to antidumping initiations in Latin America, it is not surprising to find that a large proportion of initiations involve production inputs.<sup>16</sup>

### **Macroeconomic Determinants of Antidumping Activity: An Econometric Test**

As described earlier, antidumping procedures are governed by specific rules to determine the existence of dumping, injury, and a causal link. A strong recession in economic activity in the importing country raises the likelihood that domestic firms will perform poorly, which may facilitate the finding of material injury. A weak domestic economy may also induce foreign firms to reduce export prices, which may be interpreted as evidence on dumping (selling at prices below normal values). We would thus expect that changes in an importing country's GDP would be negatively associated with antidumping filings.

The prediction is less clear cut when we look at real exchange rate fluctuations. As argued by Knetter and Prusa, a real exchange rate appreciation reduces the foreign firm's costs denominated in the importing country's currency.<sup>17</sup> This allows the exporting firm to cut prices, which leads to a drop in domestic firms' profits and thus may facilitate the finding of evidence on material injury. If the firm adopts a pricing-to-market behavior, however, the decline in export prices in the importing country's currency will be lower than the magnitude of the real appreciation (that is, prices may not change in the limit). This implies that export prices expressed in the foreign country's currency will increase, which lowers the possibility of finding evidence of price dumping behavior.

The relation between antidumping filings and real exchange rate movements depends on which of the two effects dominates. This, in turn, may be affected by institutional aspects determining how the antidumping regime is organized in each country. If, for example, injury is determined by an independent agency less subject to political pressures (like the International Trade Commission in the United States) while the estimation of the dumping margin is carried out by a branch of the executive power (such as the Department of Commerce), then the calculation of the dumping margin may be subject to a fair degree of flexibility and discretion. Consequently, the injury test would ultimately determine the outcome of an antidumping investigation. In this case, we would expect real exchange rate movements to be positively associated with antidumping

16. These results on the time and sectoral distribution of antidumping measures in Argentina, Brazil, and Mexico do not change significantly when we consider definitive measures.

17. Knetter and Prusa (2003).



filings, as real exchange rate appreciations increase the probability of the determination of material injury.

A prolific economic literature has been developed to test empirically some of these conjectures, mainly in the case of antidumping activity in the United States. Leidy, for example, considers the sum of antidumping and countervailing duties petitions as the dependent variable, using the unemployment rate and the rate of industrial capacity utilization as indicators of macroeconomic activity; he also controls for exchange rate developments, the macroeconomic conditions in major trading partner countries (as measured by their unemployment rate), and the role of import penetration (the ratio of imports to GDP).<sup>18</sup> Leidy also includes lagged petitions as an explanatory variable to capture what he describes as a depletion effect—that is, since the stock of petitioners is finite and since many of a given year's petitions will remain under investigation in the following year, a relatively high number of petitions in one year would partially deplete the stock of potential petitions in the following year. Based on data for the period 1980–95, Leidy finds that antidumping and countervailing duties petitions responded in a statistically significant way to the state of domestic macroeconomic activity, with fewer cases initiated when the unemployment rate was low and the rate of capacity utilization was high. The estimated coefficient for the real effective exchange rate is positive (a real appreciation of the dollar appears to contribute to a rise in petitions), although it is not statistically significant.

Knetter and Prusa focus on two primary determinants of the annual number of antidumping initiations in the United States: the change in real GDP and the real exchange rate.<sup>19</sup> They find that an appreciation in the real exchange rate (with a one-year lag) leads to an increase in the number of antidumping petitions filed. Although a decline in real GDP leads to an increase in filings, the change in real GDP (with a three-year lag) is not a statistically significant determinant of antidumping filings when steel cases are excluded.

Irwin finds that the annual number of antidumping investigations in the United States is affected by two macroeconomic factors: unemployment and the exchange rate.<sup>20</sup> The trend toward greater import penetration in the U.S. economy dating from the early 1970s (a factor that is highly correlated with declining average tariffs) and legal and administrative changes in antidumping policy have also had an impact on the number of antidumping cases.

18. Leidy (1996).

19. Knetter and Prusa (2003).

20. Irwin (2004).

Niels applies a similar empirical test to the case of Mexico; he finds that pressures for protection under the antidumping rules are influenced by macroeconomic factors.<sup>21</sup> Specifically, the number of antidumping complaints increases when the real exchange rate appreciates and when growth in manufacturing output slows. Both factors raise the probability that domestic industries are found to be suffering injury, whether imports are dumped or not. The analysis also finds a structural decrease in the number of antidumping complaints after the December 1994 peso devaluation in Mexico.

In what follows, we build on this empirical tradition to implement an econometric analysis aimed at identifying the relation between macroeconomic factors and antidumping initiations. As in Knetter and Prusa, we exploit the bilateral variability observed both in the dependent variable (since antidumping actions are defined as country pairs) and in some of the explanatory variables (that is, the bilateral real exchange rate) to empirically identify the response of antidumping initiations to the variables of interest.<sup>22</sup> We extend the analysis by incorporating industry-sector variability in the data. In this regard, the dependent variable not only varies across subject country, but also across two-digit ISIC sector. This allows us to examine whether industry-specific factors are also a determinant of antidumping filing. Thus our estimates of macroeconomic factors are not contaminated by industry-specific determinants. This issue has proved relevant in previous studies. For example, we noted above that Knetter and Prusa find no effect of GDP changes when the steel cases are excluded.<sup>23</sup> We also described earlier how the pattern of antidumping initiations follows a marked sectoral pattern in which a few sectors encompass a great share of antidumping cases. In most of the regressions presented below, we use industry dummies to control for industry-specific factors. We incorporate some industry-level variables later when we look at the relation between antidumping measures and tariff protection.

The equation we estimate has the following form:

$$AD_{ijkt} = c + \alpha BRER_{jt} + \beta \Delta GDP_{it} + \gamma \Delta GDP_{jt} + D_{country_i} + D_{sector_k} + D_{year_t} + v_{ijkt},$$

where  $AD_{ijkt}$  represents the number of antidumping initiations set by country  $i$  on country  $j$  for sector  $k$  at time  $t$ ;  $BRER_{jt}$  is the bilateral real exchange rate between country  $i$  (the antidumping user) and country  $j$  (the antidumping subject country),

21. Niels (2001).

22. See Knetter and Prusa (2003).

23. Knetter and Prusa (2003).

**TABLE 6. Summary Statistics**

<i>Variable</i>	<i>No. observations</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Initiations	30,924	0.015296	0.155920	0	6.000000
Foreign GDP growth	29,722	2.187197	6.475839	-20.167000	14.800000
Real exchange rate	27,214	0.999961	0.253003	0.112888	3.567803
Domestic GDP growth	30,768	2.794400	4.052891	-6.166990	12.669710
Tariff	26,069	11.388990	10.823210	0.051539	75.000000
Concentration <sup>a</sup>	22,761	1.000000	0.5104340	0.107650	3.463646

a. Country average equals one.

expressed in terms of the country  $i$  mean;  $GDP_{it}$  is the GDP of importing country  $i$ ;  $GDP_{jt}$  is the GDP of exporting country  $j$ ;  $Dcountry_i$  is a dummy for the importing country;  $Dsector_k$  is a dummy for sector  $k$ ; and  $Dyear_t$  is a year dummy.

The data we use cover antidumping initiations for Argentina, Brazil, and Mexico.<sup>24</sup> All the macroeconomic variables were taken from the World Bank's *World Development Indicators* database. The dependent variable takes values of zero or positive integers. Thus, ordinary least squares (OLS) estimates will generally not provide a good fit. We follow the existing literature in estimating the model using Poisson and negative binomial routines. Both econometric techniques are best suited to deal with the fact that the dependent variable is truncated and not continuous. The Poisson distribution, however, assumes that the mean and the standard deviation are the same, which seems to be contradicted by the evidence (table 6).

We allow for the macroeconomic variables to affect antidumping initiations both contemporaneously and also with a one-year lag. This reflects the fact that injury determination also uses previous years' information to assess industry performance.

24. The justification for using antidumping initiations instead of definitive measures as dependent variables is as follows. First, initiations could restrict imports even before the establishment of formal antidumping duties. This is documented by an extensive literature (for example, Blonigen and Prusa, 2001) and is rooted in the strategic behavior of importers, especially when antidumping duties, once established, can be charged retroactively from the moment of the initiation. Second, there is an important lag between the opening of an investigation and the moment that final duties are established (in the case of Argentina, this lag was almost two years or more for some cases). The time lag for the initiation of an investigation (from the filing date) is much shorter, at up to six months. This allows us to study contemporaneous correlations (or at most with a one-year lag) between antidumping measures and macroeconomic variables. If we were to use definitive measures, the correlations would be contaminated by procedural restrictions affecting the time lag for reaching the final decision on a case. Finally, in part because of the previous reasons, most of the literature uses antidumping filings (when public) or initiations. Using initiations allows us to compare our results with previous studies.

To evaluate the economic impact of the different variables on antidumping actions, we take the Knetter and Prusa approach and calculate incidence rates:<sup>25</sup>

$$v_i = e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n},$$

where  $v_i$  is the expected number of occurrences (in our case, antidumping actions) within a one-year period (as all our variables are measured at one-year intervals). We calculate incidence rate ratios (IRR) for each explanatory variable as the ratio of  $v_i$  evaluated at one standard deviation above the mean, keeping all other variables at their mean, to  $v_i$  estimated when all variables are at their mean.

Table 7 shows the results of the pooled regressions when we stack the data for the three countries together.<sup>26</sup> The total number of observations is the sum of the number of initiations by subject country–industry pairs across the three filing countries (that is, Argentina, Brazil, and Mexico). We have twenty-two two-digit ISIC sectors, and the coverage of subject countries is defined as those nations against which we observe at least one antidumping initiation in the 1990–2001 period (thirty-five for Argentina, sixty-one for Brazil, and thirty-four for Mexico).

The results suggest a positive and significant partial relation between antidumping initiations and real exchange rate fluctuations. This result is robust to changes in econometric techniques, the inclusion of sector and year dummies, and the correction of the standard error by clustering (by affected country). The coefficient remains positive and significant in all regressions when we run the model using the lagged value of the real exchange rate deviations. We take the negative binomial estimation as our preferred specification (column 6). The computed IRR (shown in the table 8) then implies that a one-standard-deviation increase in the (contemporary) real exchange rate (that is, a real appreciation of about 25 percent relative to the mean) raises expected antidumping initiations by about 20 percent.

The effect of GDP growth is negative and significant, as expected. As with the real exchange rate movements, this result is robust to different econometric techniques and also survives when we introduce sector and year dummies and when we correct the standard errors by clustering. The evidence on the impact of lagged GDP growth is somewhat weaker. The estimated coefficient is negative and significant in the Poisson and negative binomial specifications (when

25. Knetter and Prusa (2003).

26. We present separate country regressions below.

**TABLE 7. Initiations versus Macroeconomic Variables: Pooled Regressions<sup>a</sup>**

<i>Explanatory variable</i>	<i>Poisson</i>			<i>Negative binomial</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
Real exchange rate	0.853	0.853	0.657	0.926	1.065	0.722
Robust <i>t</i> statistic	(6.17)***	(5.97)***	(3.44)***	(4.63)***	(5.58)***	(3.47)***
Corrected <i>t</i> statistic <sup>b</sup>	(3.02)***	(3.02)***	(2.09)**	(3.73)***	(3.99)***	(2.75)***
Domestic country GDP growth	-0.032	-0.032	-0.089	-0.029	-0.022	-0.077
Robust <i>t</i> statistic	(2.74)***	(2.74)***	(4.11)***	(2.35)**	(1.73)*	(3.72)***
Corrected <i>t</i> statistic <sup>b</sup>	(1.96)**	(1.96)**	(3.37)***	(1.89)*	-1.26	(3.02)***
Foreign country GDP growth	0.069	0.069	0.074	0.056	0.085	0.085
Robust <i>t</i> statistic	(3.98)***	(4.00)***	(4.39)***	(3.73)***	(4.82)***	(5.03)***
Corrected <i>t</i> statistic <sup>b</sup>	(1.09)	(1.09)	(1.27)	(1.1)	(1.45)	(1.55)
No. observations	27,170	27,170	27,170	27,170	27,170	27,170
<i>Lagged explanatory variable<sup>c</sup></i>						
Lagged real exchange rate	0.912	0.912	0.882	1.008	1.049	1.052
Robust <i>t</i> statistic	(5.95)***	(5.87)***	(5.32)***	(5.01)***	(5.66)***	(5.74)***
Corrected <i>t</i> statistic <sup>b</sup>	(2.75)***	(2.75)***	(2.41)**	(3.16)***	(2.90)***	(2.98)***
Lagged domestic country GDP growth	-0.017	-0.017	-0.04	-0.013	-0.012	-0.027
Robust <i>t</i> statistic	(1.25)	(1.26)	(2.19)**	(0.94)	(0.86)	(1.54)
Corrected <i>t</i> statistic <sup>b</sup>	(0.97)	(0.97)	(2.57)**	(0.77)	(0.69)	(1.69)*
Lagged foreign country GDP growth	0.071	0.071	0.07	0.063	0.09	0.091
Robust <i>t</i> statistic	(4.00)***	(4.03)***	(4.54)***	(4.34)***	(5.35)***	(5.76)***
Corrected <i>t</i> statistic <sup>b</sup>	(1.09)	(1.09)	(1.29)	(1.26)	(1.49)	(1.69)*
No. observations	24,838	24,838	24,838	24,838	24,838	24,838
Sector dummies	No	Yes	Yes	No	Yes	Yes
Year dummies	No	No	Yes	No	No	Yes

\* Statistically significant at the 10 percent level.

\*\* Statistically significant at the 5 percent level.

\*\*\* Statistically significant at the 1 percent level.

a. The dependent variable is the number of antidumping initiations, defined as subject country–industry pairs, in year *t*. The pooled regressions were estimated using both Poisson (equations 1–3) and negative binomial techniques (equations 4–6). The total number of observations is the sum of the number of initiations by subject country–industry pairs across the three filing countries (that is, Argentina, Brazil, and Mexico). Robust *t* statistics in parentheses.

b. *T* statistic corrected for cluster effects (by affected country).

c. One-year lag.

**TABLE 8. Incidence Rate Ratios (IRR)**

<i>Model</i>	<i>Pooling<sup>a</sup></i>	<i>Random effects<sup>b</sup></i>
Real exchange rate	1.20	1.24
Domestic GDP	0.73	0.91
Foreign GDP	1.74	1.27
Lagged real exchange rate	1.29	1.25
Lagged domestic GDP	0.90	0.95
Lagged foreign GDP	1.83	1.36

a. IRR calculated for specification in column 3 of table 7.

b. IRR calculated for specification in column 2 of table 9.

we include year and sector dummies), but we observe a sharp decline in the estimated (absolute) value of the coefficient. Regarding the quantitative impact of GDP growth on antidumping initiations, the IRR calculations suggest that a one-standard-deviation increase in GDP growth (about 4 percent) lowers the number of expected initiations by about 27 percent (see table 8).

The impact of fluctuations in the partner country's GDP is positive and significant in most of the regressions, though this finding almost disappears when we correct for cluster effects. This evidence seems contrary to the simple intuition that a weak foreign economy will lead foreign firms to cut prices and increase exports to maintain their overall levels of output. Even so, this result is not surprising. As documented earlier, China was one of the main subject countries in terms of antidumping measures in this period, although this economy performed very well in terms of both GDP and export growth.<sup>27</sup>

We estimated the model with and without industry fixed effects. The presence of this (unobservable) industry characteristic does not affect the correlation between macroeconomic variables and antidumping activity. The point estimates of the fixed effects suggest that the establishment of antidumping measures has a strong pattern of concentration in few sectors, as expected based on our earlier analysis.

The above results were obtained by running pooled regressions. In our first robustness check, we take advantage of the panel structure of the data and estimate a random effects specification. This type of technique allows us to control for unobserved (random) characteristics defined at the level of the affected country and industry. Table 9 presents the results. The above findings are practically unchanged in the new estimations. The real exchange rate is positively and significantly associated with antidumping initiations, while the partial correlation with GDP growth is negative and significant. Lagged real exchange rate deviation from trend is also positively and significantly associated with initiations, though lagged GDP growth is not. Table 8 shows that in the random effects estimation, the quantitative impact (IRR calculations) of the antidumping responses to real exchange rate fluctuations is similar to that obtained in the pooled regressions, but is larger with respect to domestic GDP growth.

As mentioned, we included industry dummies to control for any feature that stays constant across time, to account for the concentration of antidumping actions in a few sectors (especially steel). Nevertheless, time-varying industry-specific circumstances might influence antidumping actions. An obvious can-

27. Given that this partial correlation is explained basically by the case of China, it is not surprising that it is weakened when we take cluster effects into account.

**TABLE 9. Initiations versus Macroeconomic Variables: Panel Estimation<sup>a</sup>**

<i>Explanatory variable</i>	<i>Poisson (1)</i>	<i>Negative binomial (2)</i>
Real exchange rate	0.86 (4.42)***	0.84 (4.10)***
Domestic country GDP growth	-0.029 (2.49)**	-0.023 (1.83)*
Foreign country GDP growth	0.038 (2.80)***	0.036 (2.59)***
No. observations	27,170	27,170
No. groups <sup>b</sup>	2,398	2,398
<i>Lagged explanatory variable<sup>c</sup></i>		
Lagged real exchange rate	0.954 (4.59)***	0.927 (4.22)***
Lagged domestic country GDP growth	-0.012 (0.96)	-0.013 (0.98)
Lagged foreign country GDP growth	0.037 (2.74)***	0.046 (3.16)***
No. observations	24,838	24,838
No. groups <sup>b</sup>	2,398	2,398

\* Statistically significant at the 10 percent level.

\*\* Statistically significant at the 5 percent level.

\*\*\* Statistically significant at the 1 percent level.

a. The dependent variable is the number of antidumping initiations, defined as subject country–industry pairs, in year  $t$ . The panel regressions use a random-effects specification, with Poisson (equation 1) and negative binomial techniques (equation 2). The total number of observations is the sum of the number of initiations by subject country–industry pairs across the three filing countries (that is, Argentina, Brazil, and Mexico). Robust  $t$  statistics in parentheses.

b. Country of origin–industry pairs.

c. One-year lag.

didate for the case of the steel sector is variation in international prices. We control for this in two alternative ways. First, we drop the observations associated with this industry altogether and see whether the results are maintained.<sup>28</sup> Second, more directly, we include a sector-time interaction dummy to capture any time-varying characteristic associated with the steel industry (like international prices). Table 10 shows the results of both exercises. We do not find any significant changes with respect to the results shown in table 7.

Another empirical exercise we perform is to add other explanatory variables on the right-hand side and see whether our earlier results are maintained (that is, we check for misspecification of the regression equation). The choice of these other variables could be motivated by another hypothesis regarding

28. Knetter and Prusa (2003) also perform this exercise; they find that the partial correlation between antidumping actions and domestic GDP growth is lost.

TABLE 10. Controlling for Steel-Sector Effects<sup>a</sup>

Explanatory variable	No steel		Sector-time interaction	
	Poisson (1)	Negative binomial (2)	Poisson (3)	Negative binomial (4)
Real exchange rate	0.667 (2.66)***	0.725 (2.81)***	0.657 (3.42)***	0.733 (3.48)***
Domestic GDP growth	-0.075 (3.57)***	-0.069 (3.29)***	-0.089 (4.12)***	-0.076 (3.80)***
Foreign GDP growth	0.116 (5.76)***	0.126 (6.80)***	0.074 (4.38)***	0.088 (5.17)***
No. observations	25,935	25,935	27,170	27,170
<i>Lagged explanatory variable<sup>b</sup></i>				
Lagged real exchange rate	0.965 (4.44)***	1.024 (4.63)***	0.882 (5.24)***	1.054 (5.81)***
Lagged domestic country GDP growth	-0.024 (1.18)	-0.012 (0.59)	-0.04 (2.19)**	-0.026 (1.49)
Lagged foreign country GDP growth	0.115 (6.21)***	0.135 (7.71)***	0.07 (4.52)***	0.094 (5.90)***
No. observations	23,709	23,709	24,838	24,838
Year dummies	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes

\* Statistically significant at the 10 percent level.

\*\* Statistically significant at the 5 percent level.

\*\*\* Statistically significant at the 1 percent level.

a. The dependent variable is the number of antidumping initiations, defined as subject country–industry pairs, in year  $t$ . The estimations are pooled regressions using both Poisson (equations 1 and 3) and negative binomial techniques (equations 2 and 4). We controlled for steel sector effects by dropping steel sector observations (equations 1 and 2) and by incorporating a sector–time interaction dummy for the steel sector (equations 2 and 3). The total number of observations is the sum of the number of initiations by subject country–industry pairs across the three filing countries (that is, Argentina, Brazil, and Mexico). Robust  $t$  statistics in parentheses.

b. One-year lag.

the determination of antidumping actions. We already mentioned a possible alternative explanation: antidumping measures may have been established simply as a mechanism for replacing formal tariff protection, which would generate a negative relation between antidumping measures and tariff levels. Also, antidumping legislation may respond to lobbying activity in each country (beyond any macroeconomic factor), which, in turn, could be positively related with the industry's level of concentration. Table 11 shows the result of introducing the tariff and industry concentration variables in the regressions. We find no significant association between tariffs and antidumping actions in the contemporaneous specification, but we do obtain a negative and significant association when we allow for lagged effects of the explanatory variables.<sup>29</sup> On the other hand, antidumping

29. This result is maintained when we run random-effects estimations.



**TABLE 11. Antidumping Actions, Tariffs, and Industry Concentration<sup>a</sup>**

<i>Explanatory variable</i>	<i>Poisson (1)</i>	<i>Negative binomial (2)</i>	<i>Poisson (3)</i>	<i>Negative binomial (4)</i>	<i>Poisson (5)</i>	<i>Negative binomial (6)</i>
Real exchange rate	0.697 (2.68)***	0.711 (2.58)***	1.083 (4.77)***	1.228 (4.64)***	1.065 (2.52)**	1.374 (3.25)***
Domestic country	-0.106 (4.14)***	-0.088 (3.67)***	-0.105 (4.67)***	-0.094 (4.39)***	-0.164 (3.02)***	-0.174 (2.87)***
Foreign country	0.076 (3.85)***	0.089 (4.39)***	0.089 (4.72)***	0.101 (5.19)***	0.089 (4.72)***	0.101 (5.21)***
Tariff	-0.023 (1.24)	-0.015 (0.82)				
Concentration			0.175 (0.49)	0.062 (0.19)		
Concentration*GDP growth					0.062 (1.15)	0.084 (1.37)
Concentration* Real exchange rate					0.022 (0.06)	-0.151 (0.45)
No. observations	23,430	23,430	20,496	20,496	20,496	20,496
<i>Lagged explanatory variable<sup>b</sup></i>						
Lagged real exchange rate	1.347 (3.75)***	1.331 (3.82)***	1.298 (5.69)***	1.666 (6.44)***	1.153 (3.24)***	1.559 (4.17)***
Lagged domestic country	-0.043 (1.83)*	-0.045 (1.97)**	-0.046 (2.03)**	-0.036 (1.70)*	-0.099 (1.53)	-0.085 (1.27)
Lagged foreign country	0.069 (3.77)***	0.069 (3.92)***	0.078 (4.27)***	0.098 (5.31)***	0.079 (4.28)***	0.099 (5.34)***
Lagged tariff	-0.059 (6.19)***	-0.07 (5.86)***				
Lagged concentration			0.259 (0.65)	0.178 (0.49)		
Lagged concentration* GDP growth					0.056 (0.88)	0.052 (0.78)
Lagged concentration* real exchange rate					0.157 (0.57)	0.122 (0.43)
No. observations	21,098	21,098	18,207	18,207	18,207	18,207

\* Statistically significant at the 10 percent level.

\*\* Statistically significant at the 5 percent level.

\*\*\* Statistically significant at the 1 percent level.

a. The dependent variable is the number of antidumping initiations, defined as subject country–industry pairs, in year  $t$ . The estimations are pooled regressions using both Poisson (equations 1, 3, and 5) and negative binomial techniques (equations 2, 4, and 6). All specifications include year and sector dummies. The total number of observations is the sum of the number of initiations by subject country–industry pairs across the three filing countries (that is, Argentina, Brazil, and Mexico). Robust  $t$  statistics in parentheses.

b. One-year lag.

**TABLE 12. Initiations versus Macroeconomic Variables: Argentina<sup>a</sup>**

<i>Explanatory variable</i>	<i>Pooled</i>		<i>Random effects</i>	
	<i>Poisson (1)</i>	<i>Negative binomial (2)</i>	<i>Poisson (3)</i>	<i>Negative binomial (4)</i>
Real exchange rate	1.301 (2.13)**	1.319 (2.23)**	1.57 (3.84)***	1.816 (4.05)***
Domestic country GDP growth	-0.16 (2.59)***	-0.157 (2.53)**	-0.037 (2.59)***	-0.027 (1.76)*
Foreign country GDP growth	0.114 (3.95)***	0.128 (4.69)***	0.077 (3.25)***	0.075 (3.08)***
No. observations	8,140	8,140	8,140	8,140
Year dummies	Yes	Yes		
Sector dummies	Yes	Yes		
No. groups <sup>b</sup>			704	704
<i>Lagged explanatory variable<sup>c</sup></i>				
Lagged real exchange rate	0.804 (1.38)	0.727 (1.21)	1.468 (3.51)***	1.348 (2.99)***
Lagged domestic country GDP growth	-0.062 (2.24)**	-0.062 (2.21)**	-0.015 (1.04)	-0.018 (1.17)
Lagged foreign country GDP growth	0.071 (2.85)***	0.081 (3.31)***	0.032 (1.5)	0.036 (1.58)
No. observations	7,458	7,458	7,458	7,458
Year dummies	Yes	Yes		
Sector dummies	Yes	Yes		
No. groups <sup>b</sup>			704	704

\* Statistically significant at the 10 percent level.

\*\* Statistically significant at the 5 percent level.

\*\*\* Statistically significant at the 1 percent level.

a. The dependent variable is the number of antidumping initiations, defined as subject country–industry pairs, in year  $t$ . The pooled and panel (random effects) regressions were estimated using both Poisson (equations 1 and 3) and negative binomial techniques (equations 2 and 4). The total number of observations is the number of initiations by subject country–industry pairs in Argentina. Robust  $t$  statistics in parentheses.

b. Country of origin–industry pairs.

c. One-year lag.

activity and the level of industry concentration do not demonstrate any positive association. Thus, once we control for overall industry fixed effects, the variation in concentration across sectors within countries does not affect antidumping actions. The addition of these new determinants does not change our results regarding the response of antidumping initiatives to macroeconomic shocks.

So far, we have shown the estimation results assuming an equal response of antidumping actions to macroeconomic shocks in the three Latin American countries we consider. This may not be the case, however, since these economies are different in size, productive structure, and trade partners. Tables 12, 13,

TABLE 13. Initiations versus Macroeconomic Variables: Brazil<sup>a</sup>

Explanatory variable	Pooled		Random effects	
	Poisson (1)	Negative binomial (2)	Poisson (3)	Negative binomial (4)
Real exchange rate	-0.088 (0.14)	-0.01 (0.01)	-0.501 (1.1)	-0.5 (1.05)
Domestic country GDP growth	0.119 (1.59)	0.126 (1.62)	0.041 (1.1)	0.034 (0.88)
Foreign country GDP growth	0.003 (0.1)	0.01 (0.32)	-0.036 (1.55)	-0.033 (1.4)
No. observations	10,956	10,956	10,956	10,956
Year dummies	Yes	Yes		
Sector dummies	Yes	Yes		
No. groups <sup>b</sup>			968	968
<i>Lagged explanatory variable<sup>c</sup></i>				
Lagged real exchange rate	0.005 (0.01)	-0.023 (0.04)	-0.207 (0.38)	-0.212 (0.37)
Lagged domestic country GDP growth	-0.235 (2.22)**	-0.243 (2.27)**	-0.051 (1.5)	-0.045 (1.25)
Lagged foreign country GDP growth	0.065 (2.30)**	0.081 (2.54)**	0.056 (2.00)**	0.062 (2.16)**
No. observations	10,010	10,010	10,010	10,010
Year dummies	Yes	Yes		
Sector dummies	Yes	Yes		
No. groups <sup>b</sup>			968	968

\* Statistically significant at the 10 percent level.

\*\* Statistically significant at the 5 percent level.

\*\*\* Statistically significant at the 1 percent level.

a. The dependent variable is the number of antidumping initiations, defined as subject country–industry pairs, in year  $t$ . The pooled and panel (random effects) regressions were estimated using both Poisson (equations 1 and 3) and negative binomial techniques (equations 2 and 4). The total number of observations is the number of initiations by subject country–industry pairs in Argentina. Robust  $t$  statistics in parentheses.

b. Country of origin–industry pairs.

c. One-year lag.

and 14 therefore show the coefficients estimated separately for Argentina, Brazil, and Mexico, respectively.

For the case of Argentina, we find very strong results in which both real exchange rate appreciations and sluggish GDP growth are associated with an increasing use of antidumping actions. Lagged GDP growth is also negatively related to antidumping activity. The results for Brazil are much weaker. Only lagged GDP growth appears to be negatively related to antidumping initiations (for the pooled regressions). Mexico lies between Argentina and Brazil. We

TABLE 14. Initiations versus Macroeconomic Variables: Mexico<sup>a</sup>

Explanatory variable	Pooled		Random effects	
	Poisson (1)	Negative binomial (2)	Poisson (3)	Negative binomial (4)
Real exchange rate	0.162 (0.71)	0.259 (1.07)	1.162 (4.05)***	1.038 (3.43)***
Domestic country GDP growth	-0.031 (0.52)	-0.029 (0.47)	-0.037 (1.44)	-0.031 (1.07)
Foreign country GDP growth	0.08 (2.94)***	0.097 (3.76)***	0.07 (2.84)***	0.065 (2.48)**
No. observations	8,074	8,074	8,074	8,074
Year dummies	Yes	Yes		
Sector dummies	Yes	Yes		
No. groups <sup>b</sup>			690	690
<i>Lagged explanatory variable<sup>c</sup></i>				
Lagged real exchange rate	0.259 (1.00)	0.499 (2.11)**	1.092 (3.63)***	1.129 (3.60)***
Lagged domestic country GDP growth	0.031 (0.51)	0.031 (0.52)	0.003 (0.11)	-0.002 (0.05)
Lagged foreign country GDP growth	0.049 (1.79)*	0.078 (3.36)***	0.032 (1.31)	0.047 (1.78)*
No. observations	7,370	7,370	7,370	7,370
Year dummies	Yes	Yes		
Sector dummies	Yes	Yes		
No. groups <sup>b</sup>			690	690

\* Statistically significant at the 10 percent level.

\*\* Statistically significant at the 5 percent level.

\*\*\* Statistically significant at the 1 percent level.

a. The dependent variable is the number of antidumping initiations, defined as subject country–industry pairs, in year  $t$ . The pooled and panel (random effects) regressions were estimated using both Poisson (equations 1 and 3) and negative binomial techniques (equations 2 and 4). The total number of observations is the number of initiations by subject country–industry pairs in Argentina. Robust  $t$  statistics in parentheses.

b. Country of origin–industry pairs.

c. One-year lag.

find evidence that real exchange rate appreciations are positively related to contingent protection, with weaker results for GDP. The different results for the three countries could be explained by two trends. First, macroeconomic fluctuations in Argentina have been much stronger than in the other two economies, allowing more variability in both the dependent and explanatory variables to econometrically identify the coefficient of interest. Second, the weak results for Brazil could be related to the fact that this country is behind Argentina and Mexico in terms of implementing its unilateral trade liberalization process (which was completed in late 1994). In fact, Brazil has initiated the fewest antidumping cases of the three countries. Even after the process of

unilateral liberalization was completed, Brazil used nontariff barriers as a form of protection more frequently than Argentina or Mexico.<sup>30</sup>

### Concluding Remarks

The main purpose of this study was to document the use of contingent protection mechanisms by Latin American countries. In particular, we have described antidumping actions in the region since the late 1980s. We identified the number of antidumping investigations initiated in each year, the number of these investigations that led to the imposition of import duties, the sectors involved, and the exporting countries subject to these measures. We found that Argentina, Brazil, and Mexico are the main users of these instruments in the region, with more than 80 percent of all cases (85 percent of definitive measures). With regard to subject countries, Brazil and China are important for Argentina; China and the United States are the main subjects for Brazil; and China and the United States are the key countries for Mexico (where the United States accounts for almost 30 percent of total initiations). We find a clear pattern of concentration of antidumping measures: chemicals and basic metals are antidumping-intensive industries in all three countries, while Argentina also displays heavy antidumping activity in metal products, machinery and equipment, and engines and electrical equipment.

We also study the relation between the implementation of these actions and the behavior of key macroeconomic variables, such as the level of economic activity and the real exchange rate. We find support for the hypothesis that these countries have used contingent protection to support domestic industries in times of macroeconomic hardship. In particular, real exchange rate appreciations and sluggish GDP growth are associated with increasing use of antidumping actions. The estimated quantitative impact seems quite significant: a 25 percent real appreciation raises expected antidumping initiations by about 20 percent, on average, while a 4 percentage point decline in GDP increases expected antidumping activity by 27 percent. When we allow the response to vary by country, we find very strong and significant results for the case of Argentina. The results are much weaker for Brazil: only lagged GDP seems to have an effect on antidumping initiation. Mexico stands in middle position, in which real exchange rate fluctuations (contemporary and lagged) have a

30. See Sanguinetti and Salustro (2001).

significant and positive impact on antidumping actions, but GDP fluctuations have a weaker effect.

Finally, we test the alternative hypotheses of whether antidumping measures were established as a mechanism for replacing the protection of regular tariffs or whether these policies were determined by political-economy variables like industry concentration. We find some evidence suggesting that lower tariffs are associated with increasing antidumping cases, although this finding does not weaken the association between contingent protection and the macroeconomic variables. Concentration indicators do not seem to be relevant in the determination of antidumping measures (after we control for industry fixed effects).

### **Appendix: The WTO Antidumping Agreement**

In addition to substantive rules governing the determination of dumping, injury, and causal link, the Antidumping agreement sets forth detailed procedural rules for the initiation and conduct of investigations, the imposition of measures, and the duration and review of measures. The agreement specifies that investigations should generally be initiated on the basis of written requests submitted by or on behalf of a domestic industry. It also establishes requirements for evidence of dumping, injury, and causality, as well as other information regarding the product, industry, importers, and exporters. Investigations should be completed within one year, and in no case more than eighteen months, of initiation.

Provisional measures can be imposed no sooner than sixty days after the initiation of an investigation. They may take the form of a provisional duty or a security by cash deposit or bond equal to the amount of the preliminarily determined margin of dumping. The time limit for the imposition of provisional measures is generally four months. The exporter and the importing country may enter into negotiations to revise prices or cease exports at dumped prices in an effort to settle an investigation, but only after a preliminary affirmative determination of dumping, injury, and causality has been made.

The imposition of antidumping duties is optional, even if all the requirements for imposition have been met. The Antidumping Agreement also states that the application of a lesser duty rule is desirable. In other words, the authorities should impose duties at a level below the margin of dumping if this level is adequate to remove injury. The sunset clause requirement establishes that dumping duties shall normally terminate no later than five years after first being applied,

unless a review investigation prior to that date establishes that expiry of the duty would be likely to lead to a continuation or recurrence of dumping and injury. This five-year sunset clause also applies to price undertakings.

Disputes in the antidumping area are subject to binding dispute settlement before the Dispute Settlement Body of the WTO. Members may challenge the imposition of antidumping measures, and raise all issues of compliance with the requirements of the Antidumping Agreement, before a panel established under the Dispute Settlement Body. WTO member countries must inform the WTO Committee on Antidumping Practices about all preliminary and final antidumping actions. They are also required to bring their antidumping legislation into conformity with the Antidumping Agreement and to notify the committee of that legislation.

## Comments

**Osmel Manzano:** This paper represents an important contribution to the literature on the effects of trade liberalization in Latin America. Antidumping measures are generally seen as providing governments with the tools they need to respond to imports that are deemed to have unfairly harmed domestic producers. According to the most straightforward (or even naïve) interpretation, these measures serve to correct for imperfections in international markets stemming from noncompetitive behavior on the part of foreign firms and governments. Some analysts consider antidumping measures, together with other forms of contingent protection, to be critical for the success of the trade liberalization process taking place around the world. Dam argues that the inclusion of these exceptions was crucial for the success of the early GATT rounds, because such instruments offered assurances to local producers that the liberalization process would be accompanied by measures of protection against unfair competition.<sup>1</sup>

Latin America and the Caribbean have a long history with the liberalization process. As Sanguinetti and Bianchi argue, however, little research has been done on the use of antidumping measures in the region. Their main findings are important. The evidence presented here shows that the initiation of antidumping measures is affected by negative macroeconomic conditions. In particular, real exchange rate appreciations and GDP contractions increase the likelihood that an antidumping measure will be initiated. The authors also find that the likelihood that an antidumping measure will be initiated is not correlated with variables related to political-economy arguments about the use of such measures—specifically, with industry concentration. Finally, the authors find that the likelihood of an initiation rises if the level of protection previously received by a sector (measured by the lagged value of the tariff level) was high.

The next issue to be addressed involves the implications of these results for policymaking purposes. Specifically, are the design and use of antidumping measures in Latin America welfare improving? The authors suggest that any

1. Dam (1970).



negative welfare effects are likely to be small. Nevertheless, a more precise and in-depth analysis is required to explore this issue. In this regard, the question posed above should be framed differently: are antidumping measures necessary from a welfare perspective? In other words, are they welfare-improving policy interventions? I presented one justification for antidumping measures at the beginning of this comment—namely, that they serve to correct for imperfections in international markets stemming from noncompetitive behavior on the part of foreign firms. I know of no evidence that this is relevant for import markets in Latin American countries, and the paper does not provide such evidence, either.

Fischer and Prusa formalize an alternative argument in which trade exceptions serve as insurance to sectors that might be injured by liberalization.<sup>2</sup> Such exceptions could help reduce the risk of sectors that might be exposed to more shocks under trade liberalization than in a closed economy. For example, a policy intervention along the lines of contingent protection could be welfare improving in the presence of temporary exchange rate fluctuations combined with some irreversibility in the production process.<sup>3</sup> The case for protection against abrupt changes in domestic GDP could be harder to make under this argument, but it is still possible.<sup>4</sup>

This raises a second question, however. Given that the government wants to insure local producers against shocks that were not present (or were less pronounced) when the economy was closed, is contingent protection the best policy intervention? Fischer and Prusa show that this type of insurance can be provided by other means—specifically, a scheme of taxes and subsidies.<sup>5</sup> They argue that antidumping measures may indeed be associated with protectionist pressures rather than welfare-improving policies.

In this regard, Sanguinetti and Bianchi find that lagged tariffs have a positive impact on the likelihood of an antidumping case initiation. This finding supports the view of antidumping measures as protectionist policies. Moreover, in their test, the effect of local and foreign GDP fluctuations on case initiations becomes insignificant once the effect of tariffs is included. This further strengthens the argument that antidumping measures are used for protectionist purposes. The effect of the real exchange rate, however, continues to be present even

2. Fischer and Prusa (1999).

3. The latter may be related to fixed costs of entry and exit, as proposed in Hausmann and Rigobon (2003).

4. Examples include a negative productivity shock stemming from a natural disaster or an important contraction of the domestic economy as a result of a financial crisis.

5. Fischer and Prusa (1999).

after the tariff effect is included. Therefore, antidumping rules may be fulfilling a welfare-enhancing role regarding real exchange rate fluctuations.

This sets the stage for a more comprehensive evaluation of the welfare effects of antidumping measures. A key issue is whether the benefits derived from insuring local producers against real exchange rate shocks are greater than the costs generated by protecting sectors that do not require it, which results in an inefficient resource allocation. Sanguinetti and Bianchi suggest that these costs might be small in the Latin American case, since only a small fraction of trade flows is affected by these investigations. Two factors should be considered, however. First, their results on tariffs indicate that these initiations are taking place in sectors that were initially highly protected. The small volume could thus reflect the high level of protection. Second, in their argument for studying case initiations rather than definitive actions, the authors suggest that importers start changing their behavior even when initiations take place.<sup>6</sup> This also implies that a low volume of imports will be registered, which again could be an indication of excess protection rather than a weak effect on total trade.

Another argument given by the authors is that antidumping measures are the price to be paid for trade liberalization. This runs counter to the evidence presented in the paper against the hypothesis that antidumping measures are the result of lobbying activities.<sup>7</sup> Additional research is clearly necessary to clarify the relation between the availability of antidumping measures and trade liberalization in the context of developing countries, where the politics of protection are likely to be different from those in developed countries.<sup>8</sup>

In summary, this paper is an important contribution to the understanding of the evolution of antidumping initiations in Latin America. The next step is to move toward a more normative analysis that would uncover the welfare implications of the increased use of antidumping measures in the region.

**Marco Bonomo:** This paper is a welcome contribution to the understanding of trade policy mechanisms and dynamics in Latin America. Tariffs have been reduced in Latin America, while the use of antidumping actions has increased.

6. The real policy measures come with the approval of definite actions. Initiations can only lead to the establishment of provisional measures, which cannot be imposed within sixty days and which have a time limit of four months.

7. As argued, industry concentration has no effect on the use of antidumping initiations. Nevertheless, previous protection does have an impact on those initiations, which suggests that protected sectors used more antidumping initiations than unprotected sectors. The question is whether they lobbied for them before trade liberalization.

8. See, for example, the formalization proposed by Maggi and Rodríguez-Clare (1998), in which a government might prefer free trade over rents from private sector lobbies.

The possibility of using this form of contingent protection makes the tariff reduction more credible. Given this two-way relation between tariffs and antidumping actions, their joint dynamics and determinants should, in principle, be studied together. However, one could simplify the investigation by taking the point of view that tariffs are exogenous to antidumping actions. This approach should be fruitful if tariffs are much more important for the determination of antidumping actions in the short run than the other way around. This seems clearly to be the case since tariffs are more structural than antidumping actions, which justifies the authors' strategy of focusing only on the determinants of the latter.

I focus my comments on alternative conceptual approaches for interpreting their empirical results. The authors follow Knetter and Prusa in choosing a normative approach based on the conditions imposed by the institutional rules that govern antidumping actions.<sup>1</sup> According to this approach, the number of antidumping actions should be related to variables that make the institutional conditions for an antidumping action most likely to be satisfied. Even the institutional rules for an antidumping action, however, are not totally objective. In all three countries examined, the imposition of antidumping measures can be denied if they are not considered to be in the national interest, even when the formal conditions of injury, positive dumping, and causality determinations are satisfied. Furthermore, rules that seem objective very often leave room for discretion, given the possibility of manipulating accounting measures. Economic and political interests may thus play an important role in determining antidumping actions.

For expositional clarity, I assume that the imposition of antidumping measures is determined only by political-economy considerations, without any role for the formal conditions, although both considerations matter in practice. In other words, I assume that the accounting measures can always be manipulated to find the necessary evidence if there is a prevailing economic interest in the antidumping initiation. Under this political-economy approach, the central government makes the final decision on an antidumping initiation. The government will clearly be influenced by lobbies—and the success of lobbying requires significant economic benefits for the affected domestic industry and the ability to coordinate the firms in that industry. A formal model would be desirable, but economic intuition provides the basis for sketching some testable implications.

Movements in variables that increase the economic benefits of protection for a specific industry should be positively related to antidumping initiations in this same industry. Intuitively, the economic benefits of a contingent protection

1. Knetter and Prusa (2003).

for an industry are high when the competition with the foreign industry is tough. Movements in variables that make this competition harsher should raise the likelihood of an antidumping measure. Examples of these movements include exchange rate appreciations, reductions in domestic productivity growth in an industry vis-à-vis its foreign competitors, a drop in domestic demand, and the lowering of industry tariffs. Those variables should explain part of the time variation in antidumping initiations at the industry level.

This formulation for industry antidumping measures implies that some aggregate variables should help explain the variability of antidumping measures at the country level. For example, exchange rate appreciations should be positively related to a country's total antidumping initiations. Since reductions in domestic productivity growth and in domestic aggregate demand should increase the number of antidumping measures at the industry level, a lower GDP growth should be associated with a higher number of antidumping actions at the country level. On the other hand, a higher GDP growth rate for a foreign country, led by a cross-industry increase in productivity, should result in a higher number of antidumping actions against that country.

Variables that are related to the degree of competition and coordination across industries should also explain cross-industry variation in antidumping initiations. As a result, industries with lower tariffs and higher concentration should have more antidumping initiations.

The normative approach also predicts that antidumping filings should be negatively related to GDP growth, but its predictions are ambiguous with respect to real exchange rate variations. The political-economy approach shares the same implication for the effect of exchange rate appreciations, and it has a rich set of implications beyond that.

In general, the results obtained in the paper are consistent with the political-economy approach: real exchange rate appreciation, a lower domestic GDP growth, a higher foreign GDP growth, and lower tariffs increase the likelihood of antidumping initiatives. However, the authors do not find any relation between industry concentration and antidumping initiatives.

A number of implications should be tested in future research. Although the authors have an industry-level variable as their dependent variable (antidumping initiatives by industry and country), their main explanatory variables are macroeconomic. The exception is the use of tariffs and industry concentration in one of their regression tables. In fact, the introduction cites an alternative hypothesis—that antidumping is just another form of protection—as a justification for using those two variables in their empirical experiments. However, the analysis would be enriched by a full-fledged political-economy approach.

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