

# On the spread and impact of anti-dumping

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*Abstract.* In this paper two key costs of AD protection are documented. First, once AD has been adopted, countries often have a difficult time restraining its use. In recent years 'new' users have accounted for half of the overall world total. Many of the heaviest AD users are countries who did not even have an AD statute a decade ago. Second, I will show that that, on average, AD duties cause the value of imports to fall by 30–50 per cent. I find that trade falls by almost as much for settled cases as for those that result in duties. I also find that, even for those cases that are rejected, imports fall. JEL Classification: F13

*A propos de la généralisation et de l'impact des mesures anti-dumping.* Ce mémoire souligne deux coûts importants des mesures de protection anti-dumping (AD). D'abord, une fois la mesure en place, les pays ont souvent de grandes difficultés à en restreindre l'usage. Au cours des années récentes, les "nouveaux" utilisateurs de ces mesures comptent pour la moitié de l'activité AD dans le monde. Et plusieurs des pays qui en font un usage intensif n'avaient pas de loi AD il y a une décennie. Ensuite, en moyenne, les droits de douane AD entraînent une chute des importations de l'ordre de 30% à 50%. Et le commerce chute de presque autant pour les cas où il y a résolution du problème que pour ceux où un tarif de rétorsion est imposé. Fait intéressant, il appert que les importations chutent même dans les cas où la plainte est rejetée.

## 1. Introduction

Of all the issues negotiated under the Uruguay Round, anti-dumping was perhaps the most contentious. Broadly stated, the debate pitted anti-dumping's traditional

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users, essentially industrialized countries such as the United States and the European Community against traditional non-users, primarily developing countries. Thanks to demands by the United States and the European Community, the Uruguay Round achieved only mixed success at tightening the rules governing anti-dumping (AD) actions. The strengthening of de minimis rules and the addition of sunset reviews should make AD protection less burdensome for small producers. Unfortunately, the agreement also endorsed the cumulation provision, codified the concept of the AD duty as a cost, and did little to restrain the use of price undertakings. All things considered, there is every reason to believe not only that AD disputes will continue to flourish but also that AD policy will be a key item for the next World Trade Organization (WTO) round.

To many observers, the U.S. and EC embrace of AD is frustrating and perplexing. On the one hand, the United States and the European Community preach that reducing government interference and accepting free markets will maximize growth and welfare. On the other hand, it often seems that just when developing countries begin to efficiently operate and become competitive in particular markets, industrialized countries shut down those precise markets with a trade policy that is universally decried by economists. 'Do as I say, not as I do' seems an apt description of the U.S. and EC view of the efficiency of government involvement in markets – at least with respect to AD.

A growing number of countries however, have not followed that advice. In recent years 'new' AD users (primarily developing countries) have initiated AD complaints at unprecedented rates. Only a decade ago developing countries filed only one or two complaints per year. By contrast, in recent years developing countries account for well over 100 petitions per year, close to half of the overall world total. It appears, then, that developing countries have also been seduced by AD's unique combination of GATT/WTO consistency and ease of use. Now they, too, can levy sector specific tariffs without blatantly violating their tariff bindings.

This surge of AD activity has not gone unnoticed. According to the U.S. Trade Representative, trade negotiations must preserve 'antidumping laws as effective remedies against unfair trade practices' while at the same time 'prevent misuse of other countries' antidumping laws against U.S. exporters.'<sup>1</sup> In other words, traditional AD users are worried that the 'new' users are employing AD to restrict competition and close markets that earlier GATT rounds had opened. The desire to rein in other countries' use of AD may cause industrialized countries to change their tune with respect to AD. Apparently, the United States and the European Community may finally seek to reform AD because other countries have also realized how large a loophole it is, how easy it is to use, and perhaps most important, how easy it is to misuse.

AD has become the trade policy of choice for both developed and developing economies. Unfortunately, it is not clear exactly why so many new countries are

<sup>1</sup> Letter from U.S. Trade Representative Michael Kantor to Senator Ernest Hollings, 29 June 1993, reprinted inside 'Inside U.S. Trade,' 2 July 1993, page 15.

embracing AD law. Perhaps they believe that if it is good for the United States and the European Community, then it must be good for them too. Perhaps they believe that their use of AD is the only way to defend themselves against other countries' using it against them. Or perhaps AD is simply a policy instrument that their mercantilist instincts can't resist.

Whatever the motivation, it is unlikely that many new AD users are aware of the costs of embracing such a policy. My goal in this paper is to begin the process of educating AD users as to the costs of its use. I will present evidence that shows that countries should be very careful in embracing AD protection. While current proliferation of AD actions might lead to long-run restrictions on anti-dumping, I argue that one should not overlook the short-run costs associated with AD protection.

I will emphasize two main costs of AD protection. First, there is substantial evidence that once AD has been adopted, countries often have a difficult time restraining its use. Many of the reasons why AD is so attractive to policymakers – it is an extremely flexible and timely instrument – are also reasons why it is prone to being misused. AD can be applied in so many circumstances because its rules and procedures can be broadly interpreted. A country may find it advantageous to interpret the GATT/WTO standards in such a way that a particular sector can be protected. Yet this almost always leads other sectors also to seek protection under this newly established precedent. Thus, it is difficult for governments to rein in its use. Industries like AD, since it allows them to seek protection – often with only the skimpiest evidence of injury and little evidence of economically unjustified pricing practices. As a result, countries adopting an AD statute often find it a bit like letting the genie out of the bottle: it is difficult to give one industry protection without encouraging other sectors also to seek protection. So, while it might be conceivable that AD protection raises welfare in certain circumstances, its widespread use suggests that it is often being employed inappropriately.

Second, unlike typical MFN tariffs AD duties are almost always remarkably large. On average, AD duties are 10 to 20 times higher than the MFN level, and it is not unheard of to have AD duties more than 100 times higher than the MFN level. Clearly, protection at these levels has dramatic impact on trade. I will provide evidence that that, on average, AD duties cause the value of imports to fall by 30–50 per cent. I will also show that AD actions distort trade patterns even if duties are never levied. Almost one-quarter of all AD cases are settled, often via some form of VER or marketing arrangement. I find that trade falls by almost as much for these cases as those that result in duties. As a matter of interest, I also find that even for those cases that are rejected imports fall, evidence that the mere investigation distorts trade. All things considered, policymakers would be well advised to consider the large distortions created by AD actions before they rush to embrace it.

The remainder of this paper is organized as follows. I will begin by reviewing recent trends in AD activity (section 2). I will document the the rise of AD activity over the past decade and show that the continued growth in AD activity is largely being fuelled by countries that have only recently adopted the statute. It is this spread in AD activity that keeps AD reform a top item on the WTO agenda. In the

second part of the paper I estimate the trade impact of AD law (section 3). Here, I will rely on data from the world's heaviest anti-dumping user – the United States – since it is the only country where comprehensive data are available to conduct such a study. Given that most AD adopters have used the U.S. statute as a guide for implementing their own AD statute, the lessons learned from the U.S. experience are likely to carry over to others. Using extremely disaggregated trade data, I find that AD actions have a very large effect on imports. When an AD dispute results in duties or is settled, I estimate that, on average, import quantities fall by almost 70 per cent and import prices rise by more than 30 per cent. It is interesting that even when an AD dispute is ultimately rejected, the scrutiny has a significant impact on trade. The data reveal that AD investigations – regardless of their outcome – harass importers. I find that even when the case is rejected, imports fall by about 20 per cent.

## **2. The spread of anti-dumping**

Until relatively recently AD actions were not particularly common. For instance, in the 1960s all GATT members filed only about ten anti-dumping petitions per year (Schott 1994). During the 1970s, however, a small set of users began more actively to initiate AD actions, primarily as a way to protect declining industries. Even as recently as the late 1980s AD law was essentially enforced by only five territories: Canada, New Zealand, Australia, the United States, and the European Community. Over the decade of the 1980s, more than 1,600 AD cases were filed worldwide (Finger 1993). As a group, the 'traditional' users accounted for more than 95 per cent of all AD cases during the 1980s.<sup>2</sup>

Demand for AD protection has continued to grow during the 1990s. Over the past ten years, almost 2,200 AD cases have been filed worldwide, a filing rate about 25 per cent greater than during the 1980s (see table 1). While the overall usage has increased, the most noticeable trend is the change in who is using the law. The once exclusive club has now opened its doors. Countries at all stages of development and industrialization have joined the ranks of active AD users, and it is the dozens of new users that have fuelled AD's continued growth.

Over the 1987–97 period twenty-nine countries initiated anti-dumping complaints, about triple the number that had acted during the prior ten years. Over the past ten years there has been a fivefold increase in AD filings by 'new' users.<sup>3</sup> More impressively, as compared with the early 1980s, there has been a fifty-fold increase.

Not only are new users filing more cases than they had previously, but they are also accounting for an increasing share of total complaints. Between 1987 and 1992 new users filed about 20 per cent of the AD cases in each year. By contrast, over the last five years new users account for well over half of AD complaints. The trend is

<sup>2</sup> This same group similarly dominated AD activity during the 1960s and 1970s.

<sup>3</sup> By the term 'new' users I refer to all countries other than the five traditional users of AD.

TABLE 1  
AD actions, reporting countries

Reporting country	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
<i>Traditional users</i>												
United States	15	40	24	34	63	83	32	48	14	22	16	391
Australia	22	16	21	47	68	71	59	15	5	17	42	383
European Community	28	27	18	48	29	42	21	43	33	25	41	355
Canada	31	15	13	15	11	46	25	2	11	5	14	188
New Zealand	0	9	1	1	9	14	0	6	10	4	5	59
TOTAL	96	107	77	145	180	256	137	114	73	73	118	1,376
<i>New users</i>												
Mexico	18	11	7	11	9	26	70	22	4	4	6	188
Argentina	0	0	0	0	1	14	27	17	27	22	15	123
Brazil	0	1	1	2	7	9	34	9	5	18	11	97
South Africa	0	0	0	0	0	0	0	16	16	33	23	88
Others	6	5	11	7	31	21	31	50	31	71	60	324
TOTAL	24	17	19	20	48	70	162	114	83	148	115	820
<i>Overall total</i>	120	124	96	165	228	326	299	228	156	221	233	2,196
Traditional Users	80.0%	86.3%	80.2%	87.9%	78.9%	78.5%	45.8%	50.0%	46.8%	33.0%	50.6%	62.7%
OECD Countries	95.8%	95.2%	96.9%	98.8%	84.6%	89.6%	72.2%	61.8%	51.9%	40.7%	59.7%	74.7%

SOURCE: Author's compilation based on data reported by Miranda, Torres, and Ruiz (1998).

even more striking in comparison with trends during the 1980s, when new users accounted for fewer than 5 per cent of AD cases.

It is also striking how quickly AD is embraced once legislation is enacted. Mexico, for instance, signed the GATT/WTO anti-dumping code in 1987 and filed more than thirty cases within three years. Argentina filed its first AD case in 1991 and has since averaged almost twenty cases *per year*. Likewise, South Africa has initiated more than twenty cases per year since it adopted an AD statute. Similar patterns of use – a rush to invoke the new law – are evidenced by India, Indonesia, Turkey, Malaysia, Peru, Israel, Colombia, Costa Rica, and Venezuela. The evidence is overwhelming that AD is not a statute that grows dusty from disuse.

The widespread adoption of AD law has also impacted which countries are targeted. In table 2 I detail AD actions by targeted country. Several interesting trends are evidenced. First, note that over the entire period almost ninety-nine countries were investigated – about twice as many as were investigated during the 1980s. Apparently, AD's expanding reach can be measured equally well by either the number of active users or the number of investigated countries.

Second, note that during the 1980s almost all dumping charges were made by a small number of countries and most targeted a very small set of countries. In particular, during the 1980s two-thirds of AD investigations targeted another traditional user (Finger 1993). By comparison, over the past decade only about one-third of the cases targeted a traditional AD user. In this sense, AD's reach has expanded.

In another sense, however, the targets of AD investigations are much the same as they were during the 1980s. Note that during the 1980s two-thirds of AD investigations involved countries that were fellow AD users. It is interesting that during the 1990s virtually the same percentage of AD cases (1,498 of 2,196) were filed against fellow AD users. In other words, AD is still a policy largely wielded within the club of AD users; the big difference is that now the club is bigger than it was before.

These trends are consistent with Finger's (1993) conjecture that many countries adopt AD, at least in part, to counter the sanctioning of their imports. That is, countries adopt AD not only to protect against unfair imports, but also to defend their exporters against abuse of the law abroad. From this view, AD is a part of a tit-for-tat strategy. In this case, many AD actions are motivated not by a desire to make markets more competitive but rather by a wish to deter other countries from using the law. In other words, by raising the cost of exporting, a government hopes to raise the costs of others using the law.

On the other hand, the trends are also consistent with the view that AD users are primarily the same countries that are subject to AD actions. Perhaps the notion that adopting AD law will deter others from using is incorrect. Rather, it appears that AD activity is better understood as an example of prisoner's dilemma. Each country cannot resist the temptation to protect important import-competing industries. Yet if all countries also use AD law, each country is worse off than they would be under free trade. Under this interpretation, all users would benefit if everyone agreed to stop using the law.

TABLE 2  
AD actions, targeted countries

Targeted country	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
<i>Traditional users</i>												
United States	18	10	8	18	16	26	30	14	12	21	15	188
Australia	0	2	0	0	0	2	3	0	1	0	1	9
European Community	27	23	13	24	68	70	53	31	30	37	57	433
Canada	3	5	1	1	5	8	5	1	2	1	3	35
New Zealand	2	0	0	0	1	1	1	0	1	0	0	6
TOTAL	50	40	22	43	90	107	92	46	46	59	76	671
<i>Other leading targets</i>												
China-PR	1	5	4	12	16	31	45	39	20	43	31	247
Korea	8	12	6	11	12	25	17	8	14	10	16	139
Japan	19	18	10	13	18	14	11	7	5	6	12	133
Brazil	5	6	7	7	7	18	23	9	8	10	5	105
China-Taiwan	6	8	6	11	10	15	11	5	4	8	16	100
Others	31	35	41	68	75	116	100	114	59	85	77	801
TOTAL	70	84	74	122	138	219	207	182	110	162	157	1525
<i>Overall total</i>	120	124	96	165	228	326	299	228	156	221	233	2196
Against traditional users	41.7%	32.3%	22.9%	26.1%	39.5%	32.8%	30.8%	20.2%	29.5%	26.7%	32.6%	30.6%
Against OECD Countries	67.5%	56.5%	42.7%	42.4%	53.9%	47.5%	40.5%	28.1%	43.6%	35.7%	45.5%	44.5%

SOURCE: Author's compilation based on data reported by Miranda, Torres, and Ruiz (1998).

### 3. Impact of anti-dumping

The filing trends presented indicate that the AD genie is out of the bottle. A multitude of countries have only recently enacted AD statutes, and these new users are now filing a larger and larger number of cases. What do these filings mean for the markets affected? Under the best case scenario I could estimate the impact of AD for each country and sector that has used the law. Unfortunately, the data are not available to perform such an exercise. Instead, I will estimate the effect of AD actions using data from the largest AD user, the United States.

For several reasons the United States is an excellent candidate for understanding the effects of AD protection. First of all, it has filed more AD cases than any other user. Therefore, we have a large sample of cases. U.S. industries filed over 700 AD petitions between 1980 and 1994. About a quarter of the cases were settled; of the remaining cases, about half were rejected and half resulted in duties. Second, as the world's most prominent AD user, the U.S. statute has served as the basis for many countries newly adopting AD law. The GATT AD rules are quite broad and countries have significant latitude in implementing their AD statute, but most have chosen to follow U.S. procedures. Thus, even though the estimates are based on U.S. data, they should reasonably approximate what we can expect for countries with similar AD statutes. Third, the quality of U.S. trade data is excellent. Machine-readable import statistics are available for the entire period and the data are reported at the line-item level.

Several important characteristics of AD protection should be highlighted before we proceed with our estimates. First, AD investigations involve two questions: (1) was there 'unfair' pricing (i.e., price discrimination or below-cost sales) and (2) did the dumped imports cause injury. The former question is almost always answered in the affirmative. Since 1980 fewer than 5 per cent of AD cases were rejected because the domestic industry could not show unfair pricing.<sup>4</sup>

In fact, the estimated margins (a metric of the extent of unfair pricing) averaged about 40 per cent. The median duty levied was 16 per cent. To put these margins in perspective, note that the industries seeking AD protection had MFN tariff levels averaging about 4 per cent. Many cases were subject to seemingly prohibitive levels of protection; for example, 20 per cent of the cases had duties exceeding 50 per cent; 10 per cent of the cases had duties exceeding 100 per cent. Given the size of the dumping margins, one would expect that the typical AD user receives substantial protection.

The second question – existence of injury – is where dumping cases tend to be rejected. At this stage the U.S. International Trade Commission (ITC) must decide if the dumping imports have caused, or threaten to cause, material injury to the

<sup>4</sup> The rules governing how the Department of Commerce calculates dumping margins are widely considered biased in favour of finding positive margins. See Boltuck and Litan (1991) and Lindsey (1999) for discussions.

domestic industry. Over the sample period, about half of the ITC's final injury determinations were negative (Hansen and Prusa 1996, 1997).

Perhaps the most overlooked feature of AD is that its protection is country specific. AD duties are levied only on imports from countries named in the petition. It would be unusual for a petition to name all import suppliers. Rather, a case usually names only a subset of import competitors. In our empirical analysis, therefore, it will be important to distinguish between countries named in the petition and those not named. For example, if the steel industry alleges that 1/4-inch ball bearings are being dumped from Canada and Brazil, only ball bearings from those two named countries are subject to duties. If Canadian suppliers have 10 per cent of the import market and Brazilian suppliers 15 per cent, the petition would cover 25 per cent of the rival imports. The other countries supplying 1/4-inch ball bearings would not be investigated or subject to duties. Once Canada and Brazil are sanctioned, demand for domestically produced ball bearings should increase. Demand should also increase for similar ball bearings produced by other foreign countries. For instance, Argentina should be able to sell more to the U.S. market and/or raise its price on ball bearings exports destined for the U.S. market. On average, a typical case names about 40 per cent of the total import market.

Therefore, AD actions have the potential to provide substantial protection and also to induce trade diversion. In order to quantify the effect of the petition on trade from named and non-named, I estimate a model of the form

$$y_{it} = \delta y_{i,t-1} + x'_{it} \beta + u_{it}, \quad t = -3, -2, -1, 0, 1, 2, 3, \quad (1)$$

where  $y_{it}$  is a variable measuring imports,  $\delta$  is a scalar,  $x'_{it}$  is a  $1 \times K$  vector and  $\beta$  is a  $K \times 1$  vector. Since AD actions can affect both the price and the quantity of imports, I allow  $y_{it}$  to measure either price, quantity, or value of imports, depending upon the specification.

I assume that the  $u_{it}$  follow a one-way error component model

$$u_{it} = \mu_i + \nu_{it}, \quad (2)$$

where  $\mu_i \sim IID(0, \sigma_\mu^2)$  and  $\nu_{it} \sim IID(0, \sigma_\nu^2)$  independent of each other.  $\mu_i$  denotes the individual-specific residual, differing across cases but constant for a given case. For instance, a country with comparative advantage in ball bearings is likely to have large imports year after year and hence have a large  $\mu_i$ . Time is normalized so that  $t = 0$  denotes the year the petition was filed; hence,  $t = -1$  refers to the year *prior* to the filing,  $t = +1$  refers to the year following the filing,  $t = +2$  refers to the second year following the filing, and so on. Thus, the cross-section is identified by the cases, and the time series variation is driven by annual observations on import trade before and after the AD petition.

The fixed-effects (FE) estimator is a standard way of estimating (1), since it eliminates  $\mu_i$ . However, in our application the FE estimator will be biased and potentially inconsistent, since  $y_{i,t-1}$  will be correlated with the FE-transformed residual. The extent of the inconsistency varies from application to application, but

in general the problem will be less serious the longer is the time series (Kiviet 1995). Given the relatively short length of the time series (seven years) it is necessary to account for this potential problem.

To resolve the problem we take first differences of (1), yielding

$$y_{it} - y_{i,t-1} = \delta(y_{i,t-1} - y_{i,t-2}) + (x'_{it} - x'_{i,t-1})\beta + (\nu_{it} - \nu_{i,t-1}),$$

thereby eliminating  $\mu_i$ . We can rewrite this equation as

$$\Delta y_{it} = \delta \Delta y_{i,t-1} + \Delta x'_{it} \beta + \epsilon_{it}. \quad (3)$$

By construction,  $y_{i,t-1}$  will be correlated with the transformed residual  $\nu_{it} - \nu_{i,t-1}$ , so we need to estimate the transformed equation with instrumental variables (IV). There are a multitude of moment conditions that can be exploited to derive instruments. For all time periods both  $y_{i,t-2}$  and lagged values of  $x'_{it}$  are valid instruments. For time periods  $t = 0, 1, 2, 3$  we can use additional lags of  $y_{i,t}$ ; for instance, for period  $t = 0$ ,  $y_{i,t-3}$  can be used as an additional instrument. Additional lags can be added for each forward period.<sup>5</sup>

In the tables presented below, I report estimates for both the FE estimates of (1) and IV estimates of (3). The FE estimates are a useful benchmark and the results for the two estimations procedures do not greatly differ, suggesting the fixed-effect bias is small in this application.

Public sources were used to collect the data. The International Trade Commission's *Annual Report* provides basic case information such as year of filing, outcome, and so forth. Each AD petition also contains information about the industry filing the petition, the country being investigated, the products allegedly dumped, and so on. The products are identified by the line-item tariff codes upon which the duty will be levied. Using these codes, I gathered product level data using import data from Feenstra (1996). Since most cases identify more than one line-item, I sum across all named tariff lines to construct trade for the named products (by country) for each year. Thus, for each case I construct import data for each country (only a subset of which are named).

Let me stress that the duty I use is the final duty for the case.<sup>6</sup> This duty is the best direct measure I have available to quantify the impact of the sanctions. But it should be stressed that the final duty imperfectly measures the actual protective impact. AD duties are reviewed on an annual basis and are often revised. The reason for this is that the AD duty is theoretically designed to establish a 'normal' price for the imported good. The foreign firm can raise its export price in an attempt to have the Commerce Department adjust the assigned AD duty downward (i.e., by raising

<sup>5</sup> See Hsiao (1986) and Baltagi (1995) for a more complete discussion of the estimation of dynamic panel models and the construction of valid instruments.

<sup>6</sup> Individual firms from a named country often (but not always) receive a company-specific duty; trade data, however, are collected only at the country level. It therefore is appropriate to use the average final duty specific to each country. This average tariff is reported for each named country.

its price, the foreign firm's dumping margin falls, and hence the duty can fall).<sup>7</sup> Also, raising the export price also means that the foreign firm earns the higher per unit revenue rather than allowing the duty to be collected by the U.S. government. Unfortunately, the revised duties were not available on a consistent basis, so I was not able to use the revised AD duties in my analysis.<sup>8</sup>

In a given filing, a domestic industry can and often does name more than one source country. In the investigation, if four countries are named, then both the Commerce Department and the ITC make four separate determinations, one for each country. Therefore, in our 'named country' analysis there would be four separate observations. Since the set of 'non-named' countries is the same for each of the four named countries, however, the 'non-named' analysis would have only one observation for this filing. This is the main reason why there are sizeable differences in observations across regressions.<sup>9</sup>

How might an AD investigation affect trade? To get a direct measure of the impact of AD duties, I report a specification with the (log) AD duty in each of the three years following the case ( $t = 1, 2, 3$ ). Recall, however, that the AD duty is imposed only when the case receives an affirmative final injury determination. This direct measure, then, does not pick up any potential trade restraint when the case is settled or rejected.

It is often argued that AD petitions have a profound impact on imports even if they do not result in duties (Staiger and Wolak 1989; Prusa 1992). Consider, first, that about 20 per cent of U.S. AD cases were settled, and the large majority of these cases were resolved with some type of voluntary restraint agreement. Hence, we would expect these settled outcomes to have a measurable impact on trade. Note, however, that these agreements usually involve explicit quantity restrictions but often do not mandate specific price increases. Thus, settled cases might have a substantial impact on quantities but not on prices.

There is also evidence that imports are significantly restrained when the case is rejected. For example, Staiger and Wolak (1994) find that imports fall dramatically during the investigation period, regardless of the case's ultimate outcome.<sup>10</sup> Legal scholars often refer to this as the 'harassment' effect of an AD investigation. The harassment is due both to the temporary duties that are levied during the investiga-

7 Blonigen and Haynes (1999) study the incentives to adjust prices once the AD duties have been imposed. In practice, firms vary in how much they respond to the incentive. In spite of the incentives to raise prices, many firms do not do so.

8 See Gallaway, Blonigen, and Flynn (1999) for an application that uses revised AD duties in its analysis. Note that the task of acquiring revised duties for the Gallaway et al. paper was far smaller than that of this paper, since their analysis required revised duties for only a single year. By contrast, the current application requires revised duties for the entire sample period.

9 The differencing required to perform the IV estimates also leads to fewer observations. In addition, Customs data occasionally have missing values for 'quantity,' thus reducing the number of observations in the unit value and quantity regressions.

10 Staiger and Wolak's (1994) regressions focus on trade during the first year following the filing of the petition and are therefore best interpreted as estimates of the short-run effect of AD investigations. In contrast, the regressions below are best interpreted as longer-run effects.

tion and also to the stifling effect of the uncertainty surrounding the cases outcome. It is possible, therefore, that all three outcomes – affirmative decisions (duties levied), settled, and negative decisions – can have a significant impact on imports. In order to quantify the importance of these effects I also report a specification in which dummy variables capture the affect of the case's outcome at time  $t = 1, 2, 3$ .

Finally, in all specifications I include (but do not report) year dummies for each regression. Year dummies capture macroeconomic shocks that are common across all cases but vary over time. For instance, the dollar depreciation in 1985 might affect the domestic price of all 1985 imports.<sup>11</sup>

### 3.1. *Named countries*

In table 3 I report results for the value of imports. The first (last) four columns report estimates for the named (non-named) countries.<sup>12</sup> According to the FE estimates, the imposition of AD duties significantly restrain trade in each of the first three years following the case.<sup>13</sup> Specifically, a 10 per cent duty causes imports from named countries to fall by about 1.9 per cent during the first year following the AD investigation. The impact is smaller in subsequent years but is still significant. According to the IV estimates, the impact during the first year is somewhat larger than the FE estimates, but the impact in the second and third years is no longer significant.

Given the discussion in Prusa (1997) the estimated elasticities are somewhat smaller than expected. Moreover, given the effort expended to negotiate preferential trade agreements involving tariff cuts far smaller than 10 percentage points, one would think that the estimated elasticities would be larger. More specifically, in competitive markets one would expect a 10 per cent tariff to be a significant barrier. There are several possible explanations for our relatively small estimate. First, as mentioned above in response to the AD duty the foreign firms may raise their price to the U.S. market. In terms of our estimated impact on the value of trade, such price adjustments will diminish the measured impact of AD orders. Second, AD duties vary dramatically from case to case. Although the average duty (in affirmative cases) is 45 per cent, the median duty (in affirmative cases) is 26 per cent, suggesting that there are cases with rather large duties. A review of the data indicates that there were a handful of exceptionally large duty cases: eleven cases had margin exceeding 200 per cent. Ten per cent of the cases had duties exceeding 100 per cent. Such wide disparity in duties might make the constant elasticity specification inappropriate.

For these reasons, from this point on I will primarily emphasize the results from the dummy variable specification. Note that unlike the  $\ln(\text{duty})$  specification, the parameter estimates for the outcome dummies must be transformed before they can

11 Full parameter estimates are available from the author upon request.

12 To keep the table manageable, I abuse notation by denoting the IV parameter estimates without  $\Delta$ .

13 Using the Davidson-MacKinnon (1993) test, I cannot reject the log-log specification in favour of estimating in levels.

be readily interpreted. At the bottom of the table I report the economic effect of the respective case outcomes. According to both the FE and IV estimates, an affirmative AD determination reduces the value of imports by about 50 per cent in *each* of the three years following the determination. The value of imports falls by about 60 per cent following a settlement agreement. Trade also falls in rejected cases by about 20 percent, although the effect is not statistically significant for the IV estimates.

In tables 4 and 5 I report analogous results for import quantities and prices, respectively. When we compare the tables, it becomes clear that AD has a larger impact on quantities than on prices. In particular, according to the IV dummy results, an affirmative AD determination causes quantities to fall by almost 70 per cent during the first three years following the duty. Prices increase by about half as much. It is interesting to note that the parameter estimates confirm our conjecture that settled cases will primarily entail large restrictions in import quantities but relatively small (and statistically insignificant) price increases. In particular, imported quantities fall about the same when cases are settled or result in duties. However, prices increase far less for settled cases than for affirmative cases.

There are several possibilities for this finding. First, once the final duty is in place, the exporter has an incentive to raise its price. Since the AD duty means that consumers are going to have to pay higher prices for the exporter's product, the foreign firm, rather than the U.S. government, might as well earn the extra revenue. This incentive to offset the duty is not present for settled cases. Second, the finding is consistent with the view that AD law essentially serves as a GATT-consistent tool to manage trade. The logic is that industries can influence when their dispute will be settled (Prusa 1991). For instance, certain industries seem especially proficient at creating political pressure, forcing the government to negotiate a voluntary export restraint. Given this, it appears that industries who opt to settle are primarily interested in managing their import competition rather than desiring to have import prices reflect 'fair' pricing. Third, the settlement-driven voluntary export restraints may not have a large impact on prices if there are many alternative suppliers in the market. Competitive market forces may keep prices low, even though some suppliers have agreed to limit shipments.

### *3.2. Non-named countries*

An AD case should also affect imports from non-named countries. Interestingly, while the FE and IV estimates gave quite similar results for imports from named countries, the two procedures give significantly different results when we analyze imports from non-named countries. As a result, the discussion will concentrate on the IV estimates since they have better theoretical grounding in this application.

Looking first the effect on the value of imports (table 3), we see that the dummy variable specification is not well estimated. However, the  $\ln(\text{duty})$  specification does find that non-named countries respond to the reduction in trade by named countries by increasing their sales to the U.S. market. This is precisely the effect we expect. The IV elasticity estimates imply that a 10 per cent AD duty raises non-named imports by 6 per cent during the first year, implying that non-named coun-

TABLE 3  
Impact of AD Actions on Value of Imports

	Named				Non-named			
	In Imports (FE)	In Imports (FE)	In Imports (IV)	In Imports (IV)	In Imports (FE)	In Imports (FE)	In Imports (IV)	In Imports (IV)
In Imports, $t - 1$	0.255 (0.017)**	0.255 (0.017)**	0.386 (0.060)**	0.404 (0.060)**	0.128 (0.014)**	0.136 (0.016)**	0.108 (0.022)**	0.108 (0.023)**
In Duty, year+1	-0.190 (0.037)**		-0.244 (0.045)**		0.107 (0.029)**		0.065 (0.028)*	
In Duty, year+2	-0.155 (0.043)**		0.061 (0.052)		0.146 (0.033)**		0.041 (0.029)	
In Duty, year+3	-0.124 (0.051)*		-0.005 (0.058)		0.183 (0.037)**		0.038 (0.032)	
Aff Dec, year+1		-0.788 (0.138)**		-0.888 (0.156)**		0.352 (0.126)**		0.155 (0.106)
Aff Dec, year+2		-0.651 (0.164)**		-0.656 (0.246)**		0.495 (0.153)**		0.285 (0.166)
Aff Dec, year+3		-0.687 (0.199)**		-0.755 (0.333)*		0.631 (0.184)**		0.398 (0.224)
Neg Dec, year+1		-0.404 (0.139)**		-0.295 (0.159)		0.148 (0.129)		0.009 (0.110)
Neg Dec, year+2		-0.339 (0.162)*		-0.134 (0.245)		0.205 (0.156)		0.024 (0.172)
Neg Dec, year+3		-0.348 (0.195)		-0.126 (0.329)		0.321 (0.188)		0.163 (0.231)

Settled, year+1	-0.560 (0.190)**		-0.966 (0.231)**	0.241 (0.172)	0.071 (0.154)			
Settled, year+2	-0.475 (0.210)*		-0.835 (0.333)*	0.308 (0.196)	0.106 (0.230)			
Settled, year+3	-0.893 (0.249)**		-1.438 (0.439)**	-0.023 (0.223)	-0.219 (0.298)			
Observations	3591	3591	2883	1723	1723	1401	1401	
R-squared	0.75	0.75	-	-	0.85	0.85	-	-
<i>%Δ in dependent variable per unit change in</i>								
Aff Dec, year+1		-54.95%		-59.36%	41.00%		16.07%	
Aff Dec, year+2		-48.53%		-49.65%	62.10%		31.16%	
Aff Dec, year+3		-50.66%		-55.53%	84.84%		45.11%	
Neg Dec, year+1		-33.87%		-26.51%	14.96%		0.34%	
Neg Dec, year+2		-29.67%		-15.13%	21.31%		0.89%	
Neg Dec, year+3		-30.70%		-16.45%	35.38%		14.62%	
Settled, year+1		-43.93%		-62.93%	25.39%		6.14%	
Settled, year+2		-39.14%		-58.96%	33.54%		8.32%	
Settled, year+3		-60.29%		-78.44%	-4.68%		-23.19%	

NOTES

Standard errors in parentheses; constant and year dummies not reported

\* significant at 5% level; \*\* significant at 1% level

TABLE 4  
Impact of AD actions on quantity of imports

	Named				Non-named			
	In Quantity (FE)	In Quantity (FE)	In Quantity (IV)	In Quantity (IV)	In Quantity (FE)	In Quantity (FE)	In Quantity (IV)	In Quantity (IV)
In Quantity, $t - 1$	0.134 (0.020)**	0.136 (0.020)**	0.251 (0.061)**	0.250 (0.061)**	0.120 (0.018)**	0.133 (0.019)**	0.201 (0.040)**	0.192 (0.041)**
In Duty, year+1	-0.271 (0.048)**	-0.294 (0.057)**	0.128 (0.036)**	0.122 (0.038)**				
In Duty, year+2	-0.237 (0.056)**	0.065 (0.067)	0.182 (0.041)**	0.041 (0.040)				
In Duty, year+3	-0.195 (0.067)**	-0.003 (0.073)	0.240 (0.046)**	0.053 (0.043)				
Aff Dec, year+1		-1.130 (0.181)**		-1.134 (0.200)**		0.391 (0.155)*		0.356 (0.144)*
Aff Dec, year+2		-0.934 (0.216)**		-0.910 (0.319)**		0.650 (0.187)**		0.615 (0.226)**
Aff Dec, year+3		-0.921 (0.263)**		-1.061 (0.428)*		0.853 (0.226)**		0.816 (0.304)**
Neg Dec, year+1		-0.486 (0.183)**		-0.376 (0.203)		0.265 (0.163)		0.157 (0.154)
Neg Dec, year+2		-0.452 (0.215)*		-0.282 (0.315)		0.123 (0.195)		0.112 (0.239)
Neg Dec, year+3		-0.435 (0.259)		-0.448 (0.425)		0.553 (0.235)*		0.674 (0.324)*

Settled, year+1	-0.628 (0.237)**	-1.100 (0.280)**	0.147 (0.210)	0.027 (0.208)
Settled, year+2	-0.543 (0.265)*	-1.030 (0.406)*	0.282 (0.241)	0.186 (0.313)
Settled, year+3	-1.068 (0.317)**	-1.774 (0.539)**	-0.111 (0.276)	-0.154 (0.407)
Observations	3167	3167	2501	2501
R-squared	0.75	0.75	0.91	0.91
<i>%Δ in dependent variable per unit change in</i>				
Aff Dec, year+1	-68.23%	-68.45%	46.02%	41.32%
Aff Dec, year+2	-61.60%	-61.73%	88.16%	80.27%
Aff Dec, year+3	-61.53%	-68.41%	128.73%	116.01%
Neg Dec, year+1	-39.52%	-32.73%	28.58%	15.58%
Neg Dec, year+2	-37.84%	-28.23%	10.92%	8.73%
Neg Dec, year+3	-37.41%	-41.65%	69.12%	86.14%
Settled, year+1	-48.13%	-68.00%	13.31%	0.58%
Settled, year+2	-43.89%	-67.13%	28.71%	14.74%
Settled, year+3	-67.33%	-85.33%	-13.89%	-21.09%

NOTES

Standard errors in parentheses; constant and year dummies not reported

\* significant at 5% level; \*\* significant at 1% level

TABLE 5  
Impact of AD actions on unit value of imports

	Named				Non-named			
	In Unit Value (FE)	In Unit Value (FE)	In Unit Value (IV)	In Unit Value (IV)	In Unit Value (FE)	In Unit Value (FE)	In Unit Value (IV)	In Unit Value (IV)
In Unit Value, $t - 1$	-0.018 (0.021)	-0.018 (0.021)	0.014 (0.056)	0.008 (0.056)	-0.039 (0.028)	-0.046 (0.028)	-0.076 (0.076)	-0.060 (0.073)
In Duty, year+1	0.059 (0.020)**		0.051 (0.023)*		0.025 (0.031)		0.030 (0.035)	
In Duty, year+2	0.044 (0.023)		-0.020 (0.026)		-0.018 (0.035)		-0.046 (0.038)	
In Duty, year+3	0.094 (0.028)**		0.053 (0.029)		-0.012 (0.040)		0.002 (0.041)	
Aff Dec, year+1		0.297 (0.075)**		0.254 (0.080)**		-0.015 (0.132)		0.069 (0.137)
Aff Dec, year+2		0.250 (0.090)**		0.234 (0.126)		-0.260 (0.159)		-0.197 (0.212)
Aff Dec, year+3		0.398 (0.109)**		0.435 (0.170)*		-0.289 (0.192)		-0.238 (0.288)
Neg Dec, year+1		-0.007 (0.076)		0.013 (0.081)		-0.163 (0.139)		-0.158 (0.148)
Neg Dec, year+2		0.095 (0.089)		0.152 (0.126)		-0.094 (0.166)		-0.102 (0.228)
Neg Dec, year+3		0.176 (0.108)		0.331 (0.170)		-0.403 (0.196)*		-0.325 (0.299)

Settled, year+1	0.078 (0.098)	0.116 (0.111)	-0.298 (0.180)	-0.280 (0.198)
Settled, year+2	0.065 (0.110)	0.144 (0.162)	-0.193 (0.206)	-0.155 (0.297)
Settled, year+3	0.186 (0.132)	0.286 (0.215)	-0.415 (0.233)	-0.374 (0.381)
Observations	3167	2501	1535	1235
R-squared	0.89	-	0.90	-
<i>%Δ in dependent variable per unit change in</i>				
Aff Dec, year+1	34.24%	28.54%	-2.37%	6.15%
Aff Dec, year+2	27.93%	25.34%	-23.84%	-19.72%
Aff Dec, year+3	48.05%	52.26%	-26.49%	-24.43%
Neg Dec, year+1	-1.00%	1.01%	-15.86%	-15.55%
Neg Dec, year+2	9.51%	15.46%	-10.23%	-11.97%
Neg Dec, year+3	18.53%	37.31%	-34.47%	-30.90%
Settled, year+1	7.64%	11.58%	-26.96%	-25.89%
Settled, year+2	6.05%	14.02%	-19.28%	-18.06%
Settled, year+3	19.40%	30.10%	-35.74%	-36.01%

NOTES

Standard errors in parentheses; constant and year dummies not reported

\* significant at 5% level; \*\* significant at 1% level

tries offset about one-third of the fall from named countries.<sup>14</sup> The IV dummy variable specification also finds that an affirmative determination leads to steadily increasing imports by non-named suppliers: imports increase by 16 per cent in year 1, 31 per cent in year 2, and 45 per cent in year 3, but the estimated coefficients are not statistically significant.

Turning next to the price and quantity effects, just as we found for the named countries, we find that the AD has a greater impact on import quantities than on prices. For the price equations, none of the estimated parameters is statistically significant. By contrast, the many of parameters in the quantity equation are significant. For instance, the dummies controlling for an affirmative AD determination are not only significant but also large and positive, implying that non-named suppliers respond to the affirmative duty on named countries by substantially increasing their sales.

#### 4. Concluding comments

In this paper I have documented the spread of AD protection and presented estimates of the trade impact of such protection. Over the past decade the number of countries using AD has dramatically increased. It is now the case that new users more actively pursue AD investigations than traditional users such as the United States and the European Community. In addition, the data suggest that such investigations have a significant impact on import trade, regardless of whether duties are officially levied. Specifically, settled cases are about as restrictive as cases that result in duties. In either event, the value of imports from named countries falls by 50–70 per cent over the first three years of protection, and, even if the case is rejected, I find that imports fall by 15–20 per cent.

Given both the large number of AD users and also the huge impact AD duties have on trade, anti-dumping will surely remain a top issue for the next WTO round. The central issue, of course, is whether the next round will tighten the rules governing AD protection. The estimates presented in this paper should be a sobering reminder to negotiators of the distortions created by AD actions.

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