Antidumping and Retaliation Threats[†,‡]

Bruce A. Blonigen
University of Oregon and NBER

Chad P. Bown
Brandeis University

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Abstract

This paper provides an attempt to shed light on the question of how the prospect of foreign retaliation affects the antidumping (AD) process in the United States. We separate the capacity for retaliation into two channels: (i) the capacity for foreign government retaliation under the dispute settlement procedures of the GATT/WTO system, and (ii) the capacity for foreign industry retaliation through reciprocal claims of dumping and the foreign pursuit of ADDs in countries with antidumping regimes. Using a nested framework and analyzing U.S. AD cases between 1980 and 1998, we find significant empirical evidence consistent with the theory that U.S. *industry* is influenced by the threat of reciprocal foreign ADDs in its decision of which foreign countries to name in the initial AD petition, and that the U.S. *AD authority's* antidumping decisions are influenced by the threat of foreign retaliation under the GATT/WTO dispute settlement mechanism.

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‡ Blonigen: Department of Economics, University of Oregon, Eugene, OR 97403-1285 USA tel: (541) 346-4680, fax: (541) 346-1243, email: bruceb@oregon.uoregon.edu.
Bown (corresponding author): Department of Economics, MS 021, Brandeis University, PO Box 549110, Waltham, MA 02454-9110 USA tel: (781) 736-4823, fax: (781) 736-2269, email: cbown@brandeis.edu

1 Introduction

In the past decade, there has been a proliferation of countries adopting antidumping (AD) policies. As documented by Prusa (2001), 29 countries filed over 2000 AD cases from 1987-1997. These figures represent triple the number of filing countries and five times the AD petitions compared to the 1980s, when the primary users of AD laws were Australia, Canada, the European Community, and the United States. Proliferation of countries with AD laws also means an increased chance of seeing AD wars and retaliatory AD duties breaking out between countries. Anecdotal evidence of this certainly abounds. One important example is the filing of Canadian antidumping cases against U.S. steel products in the fall of 1992 and 1993, ostensibly in response to the initiation and subsequent U.S. antidumping duties levied against Canadian steel products from investigations begun in June 1992. More formally, Prusa and Skeath (2001) examine worldwide patterns of AD use from 1980-1998 and find evidence consistent with "tit-for-tat" retaliatory AD actions. These apparent examples of retaliation and the rising use of antidumping laws have raised substantial concern that AD activity may ultimately reverse many of the free trade gains of the GATT rounds.[1]

On the other hand, the rising threat of retaliatory AD actions may have an eventual dampening effect on AD activity, leading to some sort of "cold war" equilibrium. In other words, once other countries have the ability to retaliate in kind, a country (or petitioning industry) may find it no longer to their benefit to file antidumping cases. It may even ultimately mean that traditional users of AD laws may not wish to enforce these laws as stringently as before. For example, Lindsey and Ikenson (2001) document the rising incidence of worldwide AD activity against U.S. exporters and recommend that U.S. policymakers consider the effects of defending and promoting AD activity within the context of the WTO when one considers the interests of all domestic producers, not just those in import-competing sectors.

Retaliation as a mechanism toward free trade is not a new idea. For example, a common perception is that the trade wars stemming from the U.S. implementation of the Smoot-Hawley tariffs may have laid the foundation for the General Agreement on Tariffs and Trade (GATT). Additionally, the literature on trade negotiations has highlighted that the potential for countries to revert back

[1] Gallaway, Blonigen and Flynn (1999) report that the collective U.S. welfare cost of U.S. antidumping and countervailing duties are substantial enough to rank second only to the effects of the Multifiber Arrangement in terms of most costly U.S. trade protection programs.

to higher tariffs (i.e., retaliation) serves as an important enforcement mechanism for achieving trade protection reductions.[2]

The purpose of this paper is to examine whether threats of retaliation have had any measurable dampening effect on U.S. AD activity from 1980 through 1998. At first glance, this may seem to be a poor place to look for such dampening effects from retaliation threats. Law changes in the late 1970's led to a blossoming of U.S. AD activity during this time period and the latter half of this period (the 1990s) saw increased worldwide AD activity and evidence consistent with retaliation against U.S. exporters, as noted above. There are two important responses to this concern. First, as noted by Blonigen and Prusa (forthcoming), an important research question is why there are not more AD petitions, given the relative ease with which domestic industries can obtain AD protection and the possibilities for collusive outcomes even if petitions do not bring formal AD protection. U.S. AD petitions often involve very specific and narrowly-defined products and annual activity often involves a very small portion (less than 5%) of even manufacturing activity. The threat of retaliation may be one important answer to this research question. Second, although there is evidence consistent with specific, nontrivial AD retaliation across countries, this in no way rules out the possibility of substantial reduced activity in general, due to threats of retaliation. Finally, we note that while there were only a few users of AD laws in the first half of our sample besides the U.S., two of its main trading partners, Canada and the E.C., were in this group of AD users, providing ample opportunities for AD retaliation against U.S. AD actions.

We examine two main channels through which the threat of retaliation may dampen AD activity in the U.S. The first channel is through domestic industries which decide whether to initiate an AD investigation. A straightforward model of reciprocal dumping across countries in a repeated game setting (presented in Blonigen, 2000, and summarized in the Appendix of this paper) shows that an industry is more likely to file an AD petition the greater the import penetration and the lower its "exposure" to retaliation. The industry is more "exposed" to retaliation when the industry has significant exports to the same country it is petitioning against and when that country has AD policies in place. Everything else equal, we should observe a lower probability of an AD filing against a country in our data when the domestic industry has such exposure to retaliation. The AD process

[2]Important papers in this literature include Maggi (1999), Bagwell and Staiger (1999), Grossman and Helpman (1995) and Riezman (1991).

affords a unique opportunity to examine this in that the domestic industry, not the government agencies, decides which countries are targeted (or named) in a petition.

The second channel through which the threat of retaliation may operate is at the level of the government agencies that decide the AD cases. In the U.S., the U.S. Department of Commerce (USDOC) determines whether dumping has occurred, and the U.S. International Trade Commission (USITC) determines whether the domestic industry has been materially injured due to the import sources that have been named in the AD petition. The decision to grant AD protection by these agencies may be influenced by the possibility that such an affirmative AD ruling leads to retaliation by the foreign countries through the GATT/WTO trade dispute settlement mechanism.[3] Since 1989, over thirty such cases involving AD actions have been filed under the GATT/WTO dispute settlement mechanism, with eleven of these involving the U.S. as the defendant country.[4] Just as with well-known cases, such as the U.S.-E.U. cases in bananas and beef, adverse judgments by the WTO can lead to compensation to the foreign country by allowing it to retaliate through the withdrawal of tariff concessions. Bown (2001a) presents a theoretical model that considers the misuse of AD procedures under such a situation where recourse is available to the foreign country under the GATT/WTO dispute settlement process.

Of course, a plaintiff foreign country needs to have the capacity to retaliate should it win a dispute settlement over a U.S. AD action, which would involve sufficient consumption of U.S. goods

[3]This rationale for retaliation threats requires that these agencies' decisions are not completely determined by the economic facts of the case, but that they also involve agency discretion. This assumption seems quite reasonable given the work by Hansen (1990), Moore (1992), and Hansen and Prusa (1997) that clearly shows that political considerations are important for understanding the pattern of U.S. AD decisions.

[4]Eleven independent examples of formal GATT/WTO trade disputes since 1989 in which the U.S. was a defendant country in such an AD 'trade dispute' are *Sweden v. U.S.* over 'Imposition of Anti-Dumping Duties on Imports of Seamless Steel Hollow Products from Sweden,' *Mexico v. U.S.* over 'Anti-Dumping Duties on Gray Portland Cement and Cement Clinker from Mexico,' *Norway v. U.S.* over 'Anti-Dumping Duties on Imports of Fresh and Chilled Atlantic Salmon,' *Korea v. U.S.* 'Anti-Dumping Duty on Dynamic Random Access Memory Semiconductors (DRAMS) of One Megabit or Above from Korea,' *Korea v. U.S.* over 'Anti-Dumping Measures on Stainless Steel Plate in Coils and Stainless Steel Sheet and Strip from Korea,' *Japan v. U.S.* over 'Anti-Dumping Measures on Certain Hot-Rolled Steel Products from Japan,' *EC v. U.S.* over 'United States - Anti-dumping duties on Seamless pipe from Italy,' *India v. U.S.* 'Anti-Dumping and Countervailing Measures on Steel Plate From India,' *EC v. U.S.* over 'Anti-Dumping Measures on Imports of Solid Urea from the Former German Democratic Republic,' *Korea v. U.S.* over 'Anti-Dumping Duties on Imports of Colour Television Receivers from Korea,' and *Mexico v. U.S.* over 'Anti-Dumping Investigation Regarding Imports of Fresh or Chilled Tomatoes from Mexico' (WTO 1995a and 2001).

exported to their country. In an empirical study of formal GATT trade disputes, Bown (2000) has found evidence to suggest that countries tend to implement various forms of "GATT-illegal" protection against trading partners that are unable to credibly threaten substantial retaliation, as measured by the consumption of the policy-implementing country's exports by the affected trading partner. This observation on capacity to retaliate allows us to identify this second potential channel of retaliation threat effects in our sample. In particular, we expect that smaller U.S. export volumes to a foreign country means a limited capacity to retaliate by that foreign country, and makes it more likely U.S. agencies will rule affirmatively on AD cases against such a country. Even more directly, if a foreign country is not a member of the WTO, this channel of retaliation is obviously closed to that country, making adverse U.S. AD decisions more likely.

To test our hypotheses concerning these two channels of retaliation we sample all U.S. AD cases from 1980 through 1998 and use a nested logit framework that models the U.S. industries' decisions of which countries to name in the first stage, and the U.S. government agencies' AD decision in the second stage. We find substantial evidence of dampening effects on AD activity from both channels of retaliation threats. Our estimates suggest that U.S. petitioning industries are less likely to name foreign countries in an AD petition for which there is higher exposure (in terms of U.S. exports to countries with AD laws) to retaliation. Additionally, we find that the U.S. government agencies are more likely to rule affirmatively when the named foreign country has a lower capacity to retaliate through the WTO dispute settlement process.

In terms of economic implications, our results can thus be interpreted along two dimensions. First, it appears that retaliation threats do lower AD activity when examining U.S. AD activity over the past two decades. This suggests that proliferation of AD laws across countries may not necessarily lead to more (and could lead to less) worldwide AD activity in the future. On the other hand, the results point to a shortcoming in the rules of dispute settlement of the GATT/WTO system. Even increased participation in the system is hampered by the fact that the 'retaliation-as-compensation' mechanism of dispute settlement is inherently biased against bilaterally "powerless" countries who may not be equipped with the capacity to retaliate against a particular trading partner.

The rest of the paper proceeds as follows. Section 2 introduces the empirical specification more formally, the data sample, and a brief review of the theory underlying our hypotheses. Section 3 then presents results from our base specification of our empirical framework. Section 4 provides sensitivity

analyses and a discussion of the economic significance of our estimates. Section 5 concludes.

2 The Econometric Model and Data Construction

In lieu of a formal presentation of the theory describing how the prospect of foreign recourse to ADDs and/or a GATT/WTO trade dispute can be seen to affect the ADD decision process, the reader is referred to the Appendix and Bown (2001a). The theoretical implications for each of these models on the econometric framework and data construction will be discussed in more detail below.

2.1 The Nested-Logit Framework

In practice in the United States, the AD process is multi-staged, and there are other stages beyond that which we consider here which have been analyzed in other contexts.[5] However, the basic decisions that we consider can be illustrated through a two-level tree, as in Figure 1. In the first stage of the tree, we take as exogenous the fact that the U.S. industry will initiate an AD petition against *someone.* In this first stage our focus rests on the U.S. industry's decision of which foreign countries it will 'name' versus which it will 'not-name.'

The second stage of the model is the outcome stage, where the U.S. AD authority makes a 'positive' 'negative' decision with respect to the petition. Empirically, characterization of the outcome phase is complicated by the fact that petitions can be withdrawn or settled at any point during the AD investigation. Prusa (1991) suggests that 80-90% of withdrawn cases involve a settlement or some type of agreement between the domestic and foreign industries, and Prusa (1992) provides empirical evidence to suggest that the *effect* of the settlement outcome on trade is at least as restrictive as the impact of the imposition of duties. We assume that withdrawals that occur after one or more preliminary determinations by the U.S. AD authorities (withdraw late) lead to private settlements and, hence, 'positive' outcomes for the petitioners. On the other hand, cases which are withdrawn early in the investigation, before either agency even made a preliminary ruling, were mainly cases where the

[5]For example, Hansen (1990) uses a two-staged nested logit framework in which in the first stage she considers the binary decision of all 4-digit SIC industries in the U.S. of whether or not to file a petition, and then in the last stage she considers the decision of the ADD authority, given that a petition has been filed. Prusa (1991) considers a two-staged nested logit framework focusing on the withdrawal decision. His focus however, is not on retaliation, but on the economic and political factors that influence the withdrawal of AD petitions.

petitioners quickly realized that they would likely lose if the investigation continued and, hence, we classify these as negative outcomes. Thus as our benchmark outcome, we define the USITC's decision as either 'Negative'={Reject, Withdraw Early} or 'Positive'={ADDs, Settle, Withdraw Late}.[6] We do consider alternatives to this specification of the second stage decision variable, which we report in Section 4 below.

In estimating the multi-staged decision tree, we employ a nested-logit analysis, as originally proposed by McFadden (1978).[7] Let $i \in$ {Name, Not Name} index the industry's first stage decision, and let $j \in$ {Positive, Negative} index the AD authority's second stage decision. We assume that the probability that the final outcome is alternative ij, P_{ij}, can be written as the product of the conditional probability $P_{j|i}$ and the marginal probability P_i, where, for example, each probability is of the binomial logit form

$$P_{Positive|Named} = \frac{e^{\beta X}}{1+e^{\beta X}} \quad (1)$$

$$P_{Negative|Named} = \frac{1}{1+e^{\beta X}} \quad (2)$$

$$P_{Name} = \frac{e^{\alpha Z+\theta I_{Name}}}{1+e^{\alpha Z+\theta I_{Name}}}. \quad (3)$$

In (1) and (2) β is the vector of parameters to be estimated that are associated with the second stage, AD authority's decision, and X is the matrix of second-stage covariates. In (3) α is the vector of parameters to be estimated that are associated with the first stage, U.S. industry's country 'naming' decision, and Z is the matrix of first-stage covariates. Also in (3), I_{Name} is the standard inclusive value that the industry derives from choosing alternative $i =$ Name which is defined as

$$I_{Name} = log(e^{\beta X}), \quad (4)$$

and consequently, θ is the parameter to be estimated on the inclusive value, measuring the dissimilarity between the alternatives that the industry faces in its 'naming' decision.[8]

[6] This classification is made by referring to the information released by the USITC in the *Federal Register.*

[7] Further details on the econometric theory behind the nested-logit framework can be found in McFadden (1981) or Greene (2000).

[8] An estimate of θ which is not statistically different from 1 would indicate no dissimilarity between alternatives, or in other words, the nested logit could be collapsed into a simple multinomial logit framework.

To estimate the model we will proceed sequentially, using maximum likelihood techniques. As is customary, we work backward by first estimating the second stage binary choice made by the AD authority. We then proceed by calculating the inclusive value of (4) using the estimates for β calculated in the first step, before turning to the estimation of the industry's 'naming' decision of the first stage.[9] We then calculate the first stage standard errors using the Murphy and Topel (1985) covariance matrix correction for two-step maximum likelihood estimation, before calculating and reporting the elasticities of interest.[10]

Before turning to the results of the estimation, we briefly discuss some of the basics of the underlying theory and motivate the explanatory variables of interest and data construction.

2.2 Explanatory Variables and Data Construction

In this section, we describe the data sample and standard control variables we use to estimate each stage of the nested logit framework, beginning with the second-stage decision by the U.S. AD authority. At the end of the section, we describe our focus variables that we include in each stage to estimate the impact of potential foreign retaliation.

2.2.1 U.S. AD Authority's Decision

The data sample for the U.S. AD authority's decision in the second stage is based on U.S. AD cases that were initiated and concluded from 1980 through 1998 for the import sources named in U.S. AD petitions. The domestic industry in a U.S. AD petition is required to name firms from only one country in each petition, thus the data set includes information identifying the unique parent country of the foreign firm(s) named in the case, the year of the case, and the USITC's ultimate decision in the case. The decision variable at this stage is thus a binary choice indicating either that the case outcome was 'positive' or 'negative.' In our sample of years, 645 decisions were made by the U.S. AD authority, with 370 petitions ending in positive outcomes and 275 petitions ending in

[9] Such sequential estimation using limited information maximum likelihood (LIML) has been shown to provide consistent estimates, though they are inefficient. As illustrated in our results described below, however, such LIML techniques are sufficient to provide us with convincing results as a first step in this analysis.

[10] The calculation of the elasticities of interest is complicated, in the sense that each explanatory variable has a distinct effect on each alternative at each level of the nested logit tree. For a discussion, see, for example, Greene (2000). The elasticities are calculated at the mean values of the data, most of which are reported in Table 1.

negative outcomes.[11]

As control variables for this second-stage, AD authority decision, we include many of the economic and political variables that other researchers (see, for example, Hansen and Prusa 1997) in the literature have shown influence the AD authority's ultimate positive/negative decision. Such economic variables are designed to capture the potential injury to the industry and include changes in industry capacity utilization rates (*C_CAP*) and industry employment (*C_EMP*).[12] Political variables often used include the size of domestic industry as measured by industry employment (*EMP*), and the industry's concentration ratio (*CONC*) which is designed to capture the ease with which the industry can coordinate potential lobbying activity and avoid the free-rider problem. As a statutory control, we include a dummy variable for cases which have been 'cumulated' (*D_CUMULATE*), which are related cases involving the same domestic industry filed against firms from different foreign countries.[13] Hansen and Prusa (1996) have shown that there is a significantly increased probability that such cases will be accepted when they are considered jointly. Finally, macroeconomic variables such as the national unemployment rate (*UNEMRATE*) are also used to control for changes in economy-wide influences.

The variables of international trade that are also typically included are the foreign country's share of U.S. industry imports (*IMPSHARE*) and the growth rate in the U.S. imports of the product under investigation from the foreign country from the previous year (*C_IMP*), which looks to capture the potential for a surge in imports.[14] Also typically included is the pre-petition U.S. industry tariff (*TARIFF*), suggesting that AD authority may be more willing to provide ADD protection to industries that have already undertaken substantial liberalization.[15]

[11] Underlying this we have 248 formal USITC rejections, 285 cases resulting in the imposition of ADDs and 113 cases which were settled or withdrawn. Based on data limitations, we are also only able to include AD cases in the manufacturing sector.

[12] In unreported results, we have also controlled for changes in domestic industry shipments, which seem to have little influence.

[13] In 1984 the antidumping law in the U.S. was amended by Congress to require that the USITC cumulate imports from countries involved in related petitions when making its injury determination.

[14] In unreported results we have also tried controlling for changes in import share in lieu of changes in the real value of imports, and this too seems to have little influence.

[15] In addition to this explanation, Bown (2001b) has suggested that industries with low pre-existing tariffs may have more to gain through a tariff increase for terms of trade reasons.

2.2.2 U.S. Industry's 'Naming' Decision

Consider next the first stage decision of whether or not a firm from a particular foreign country is 'named' in a U.S. industry's petition. For our sample, we obviously observe the import sources that were named in the petition, but we must also determine the sample of countries that were "eligible" to be named by the U.S. petitioning industry but which were not-named. To make this determination we consult the data and the relevant rules for AD procedures. In the petitions that are filed, the U.S. industry reports the disaggregated, tariff line codes for the products that it claims have been dumped.[16] We thus use the tariff line codes reported by the petitioning industry to identify in the data which countries were eligible to be named.[17] Not all of the import sources are eligible to be named in AD petitions, however, as many of them have exports to the U.S. that are too small to satisfy the statute's "non-negligibility" requirements, which we take as having a share of at least 3% of the tariff line imports of the product.[18] Note, however, that in our sensitivity checks reported in Section 4, we vary the criterion by which we determine a country as being eligible to ensure our results are robust to reasonable changes to the eligibility requirements. For the estimation results reported in Section 3, this approach toward creating a sample of import sources yields 2015 such sources that are determined by the data as being eligible: the 645 petitions in which countries were named, and then 1370 non-named countries.

Given the theory and AD statutes it is clear that the U.S. industry has an incentive to name more countries, to increase the likelihood of passing the USITC's injury test, due to the cumulation rule. In addition, large increases from a particular source should more likely lead to an injury determination. Thus, we include the foreign country's share of U.S. industry imports (*IMPSHARE*) and the growth rate in the U.S. imports of the product under investigation from the foreign country from the previous year (*C_IMP*) as control variables in the first-stage naming decision.

[16] For the period 1980-88, this was generally reported as the 5 or 7 digit TSUSA import category whereas from 1989-1998 this was reported as the 8 or 10 digit HTS import category. These codes are reported in the USITC's notice published about the case in the *Federal Register*.

[17] One caveat is that this approach obviously cannot hope to capture is the idea that U.S. industry might be choosing TSUSA or HTS categories with these biases already mind.

[18] Section 5.8 of the WTO's Antidumping Code states, "[t]he volume of dumped imports shall normally be regarded as negligible if the volume of dumped imports from a particular country is found to account for less than 3 per cent of imports of the like product in the importing Member..." (WTO 1995b).

2.2.3 The 'Threat of Foreign Retaliation' Variables

As stated, the primary contribution of our analysis is to focus on variables that are designed to measure the impact of the threat of foreign retaliation on whether import sources are named by the domestic firms and/or given positive AD decisions by the AD authorities. We focus on two possible channels of retaliation threats that may have an impact on both stages (and decisions-makers) in the AD process.

The first channel we consider is the potential retaliatory threat through what we term the *GATT/WTO channel.* As detailed by Bown (2001a), foreign countries will be better equipped to effectively threaten retaliation through the GATT/WTO dispute mechanism if (a) they receive a large amount of U.S. exports so that they have adequate leverage to retaliate, and (b) they are GATT/WTO members with experience as a plaintiff in formal trade disputes. In order to proxy for such a channel of retaliation, we construct a variable that interacts U.S. exports to a particular foreign import source as a share of total U.S. yearly exports (*US_EXPSHARE*) with an indicator variable that takes a value of 1 if the foreign country has ever been the plaintiff in a GATT/WTO dispute against the U.S. (*D_USPLAINT*).[19]

We surmise that this GATT/WTO channel of retaliation may be more of a concern for the AD authority's decision than the domestic industry decision for a couple of reasons. First, petitioning firms may not care about such potential for retaliation because it could likely concern products outside of the petitioners' own industry.[20] Second, the credibility of the AD authority's decisions may be adversely affected as more dispute settlement procedures occur, giving them incentives to minimize such events. Nevertheless, we include this proxy variable of retaliation through the GATT/WTO channel in both stages of the AD process (industry naming and AD authority decision) and expect a negative sign, indicating a lower likelihood to name import sources with higher retaliation threat, everything else equal.

A second potential channel of retaliation is what we term the *AD channel.* The domestic country may be worried about the potential for retaliatory AD actions on the part of the foreign import

[19] In sensitivity tests below, we consider other constructions of this proxy variable, including substitution of export levels for export shares and substitution of an indicator variable of GATT/WTO plaintiff experience against any country rather than GATT/WTO plaintiff against specifically the U.S. (*D_PLAINT*).

[20] For example, in the well-known U.S.-E.U. beef hormone case, the U.S. retaliated against a wide array of products not connected with beef.

sources. As shown in the Appendix, this would require that U.S. firms had sufficient export exposure in the foreign country and that the foreign import source had its own AD laws. The petitioning firms and AD authorities could be worried about retaliation in the same subject product, or more broadly about related associated products in the industry. We first specify our proxy variable for retaliation through the AD channel as the interaction between the export share to the foreign import source in the subject 8-10 digit HTS *product* and an indicator of whether the foreign import source country has active AD protection.[21] In later estimates presented below, we then consider that AD retaliation may occur beyond the specific subject product and use the relevant U.S. 4 digit SIC *industry* export share to the foreign import source country interacted with an indicator of whether the foreign import source country has active AD protection. This allows us to account for the idea that multi-product firms in the U.S. may face the threat of reciprocal AD retaliation in products outside of the more narrow, 10 digit HTS category, provided they are still within the same 4 digit SIC industry classification. While the GATT/WTO channel is likely a larger consideration for the AD authorities decision in the second stage, it seems natural to think that the AD retaliation channel will be a larger consideration for the petitioning firms' decision of which import sources to name.

Finally note that Table 1 reports summary statistics for the covariates used in the estimation, as well as the expected sign of the parameter estimates in the two stages, where the Stage 1 decision is Y_1 ='Named' and the Stage 2 decision is Y_2 ='Positive AD Decisions.' We next turn to our estimation results to examine the evidence for these hypotheses.

3 Estimation Results

For each specification of the model we use maximum likelihood to estimate the parameters of interest, which we then use to calculate the reported elasticities. In this section we consider Tables 2 and 3 which report our first set of results from a nested logit model that estimates the relationship between the covariates of interest and the choices of both (i) the U.S. AD authority (in its positive/negative decision) and (ii) the petitioning industry (in its name/not-name decision), given the industry's expectation over the U.S. AD authority's ultimate decision. The results of each stage of the two-staged model are split up into two broad sections in each of the tables. The columns on the right-hand

[21] For 1980-1988, we use Schedule B exports instead of HTS exports. For concordance between TSUSA imports and Schedule B exports, see the files of Feenstra (1996,1997).

side indicate the results of the second-stage, AD authority's decision, whereas the columns on the left-hand side indicate the results of the first-stage, industry 'naming' decision. Each fully estimated model will give elasticity estimates that are reported in two columns per model.[22] In each of the tables, the cells of the relevant 'threat of foreign retaliation' variables are shaded to help focus attention on the results of primary interest.

Model (1) in Table 2 presents our base model elasticity estimates. First, we note that in each of the models estimated, our results yield elasticities on the industry control variables that are broadly consistent with the results reported elsewhere in the literature.[23] Industry variables such as the change in the capacity utilization rate, the size of industry employment, and the steel dummy are all of the expected sign and statistically significant. This is also the case for the import market share of the country named in the petition, the growth rate of imports from the named exporter from the prior year, and the dummy variable included for cases which were cumulated. The signs and magnitudes of these control variables remain quite stable through a variety of specifications that we estimate and report below.

Consider next the estimates on the threat of foreign retaliation variables in model (1) in Table 2. In the first row is our interaction variable to estimate the effect of the *GATT/WTO* retaliation *channel.* For both the naming decision and the AD authority decision, the sign of the coefficient is negative, as expected. In other words, higher potential for foreign retaliation through the GATT/WTO dispute settlement mechanism is estimated to lower the likelihood of a foreign source being named in a U.S. AD petition and, if named, lowering the likelihood that it will result in a positive decision. However, this effect is largest and only statistically significant for the AD authority decision, which accords with our *a priori* expectations that the AD authority would be more concerned about potential retaliation through this GATT/WTO channel than petitioning firms.

The third row of Table 2 gives the elasticity estimates for our interaction variable that proxies for the threat of retaliation through the *AD channel.* This variable is negative, as expected, for the naming decision, but of the wrong sign for the AD authority decision. For both stages it is also statistically insignificant. So, at this point, the evidence for the AD channel is weak, though of

[22]For example, the two column (1)'s of Table 2 refer to the first and second stage estimates of one complete model, the two column (2)'s would refer to a second complete model, etc.

[23]For a comparison of the sign and statistical significance of the industry control variables, see for example Hansen and Prusa (1996,1997).

correct sign for the stage we would expect - the naming decision by the petitioners. Evidence for this AD channel on the naming decision gets much stronger for alternative proxies as we discuss below.

One initial concern is that there is significant collinearity between our proxy variables for the two channels of potential retaliation. In model (2) in Table 2 we include only the AD channel variable in the naming stage and only the GATT/WTO channel in the AD authority stage. As one would expect, this leads to more precise estimates, resulting in statistically significant negative coefficients for the appropriate retaliation variable in each stage.

As mentioned earlier, there are alternative ways that one could plausibly construct these proxy variables. First, we have used export shares rather than export levels to proxy for the U.S.'s exposure to foreign retaliation. However, a high export share may not mean much exposure if export levels are generally low. Thus, an alternative is to use export levels to proxy for retaliation exposure. The problem with this is that there is no implicit normalization across products/industries as with export shares that necessarily add up to 100 percent for each product/industry. A certain dollar value of trade may be a high volume for one industry and low volume for another, depending on the average size of firms in these industries. In model (3) in Table 2 we run a specification where we use export levels, rather than shares, to construct our retaliation channel variables. The results are consistent with our export share results, but with standard errors that are somewhat larger.

There are also alternative variables that may also characterize experience and ability to use the GATT/WTO channel for retaliation. Our results in Table 2 specify an indicator variable if the foreign source country has previously been a plaintiff against the U.S. in a GATT/WTO dispute. Weaker criteria are whether the foreign source country has been a plaintiff in any GATT/WTO dispute (model 4) or is even a member of the GATT/WTO (model 5). In Table 3 we present estimates when we specify our AD channel with these alternative indicators of foreign source country ability to retaliate through GATT/WTO channels. In model (6) we simply drop all observations involving China as the foreign country. Regardless of which specification we use, we get results that are almost quantitatively identical.

4 Further Sensitivity Analysis

There are three different sets of further sensitivity analysis that we report here. First, we consider alternative specifications to the second stage dependent variable, to ensure that our results are robust to changes in the characterization of the AD authority's positive/negative decision. Second, we consider changes to the eligibility requirements identifying the 'not-named' countries. Finally, we substitute *industry* level exports for the *product* level exports. Each will be described in detail in turn, before we proceed to a brief characterization of the 'economic significance' of our results in Section 4.4.[24]

4.1 Alternative Formulations for the Second Stage Outcome Variable

Recall again, that the second stage dependent variable in Tables 2 and 3 was characterized as 'Negative' = {Reject, Withdraw Early} and 'Positive'={ADDs, Settle, Withdraw Late}. In Table 4 we recategorize the second stage dependent variable to be 'Positive'={Reject, Withdraw (either late or early)} and 'Positive'={ADDs, Settle}. Under this characterization, of the 645 second stage decisions made by the U.S. AD authority, 345 petitions which were 'positive' and 300 petitions which were 'negative.' In terms of the results, while the statistical significance on the first stage 'threat of foreign retaliation' variables is a little weaker, the same general pattern of results arises.[25]

[24] In addition to the sensitivity analysis reported here, we have also checked the robustness of our results to different specifications of how one considers the E.U.. In the analysis presented here, we assume that given the common external trade policy of the E.U., the 'E.U.' is the potential retaliatory threat, so thus we aggregate all AD petitions against different E.U.-member countries regarding the same product into one E.U. AD case. We characterize the outcome for this case as the worst (from the E.U.'s countries' perspectives) outcome of all subcases. For robustness checks, we have considered specifications in which we (i) do not combine any E.U. observations, (ii) combine some E.U. observations to allow for the possibility of one E.U. 'named' observation and one E.U. 'non-named' observation, and (iii) drop all E.U. observations. The results are not significantly altered by consideration of these alternatives, and thus to conserve space we have not reported them here. They are available upon request from the authors.

[25] In unreported results available upon request from the authors, we have also considered specifications of the model in which we characterize the second stage dependent variable as 'Negative'={Reject} and 'Positive'={ADDs, Settle, Withdraw}. The results are consistent, in terms of the statistical significance, with those reported in Table 2.

4.2 Alternative Eligibility Requirements for 'Non-Named' Countries

In the estimation results presented, we have broadly followed the GATT/WTO statute in determining what countries were eligible to be named, but which were 'not-named' in the U.S. industry's first stage decision. The criterion was that the foreign country had to have a share of the U.S.'s import market of at least 3% of the products under investigation. In this section we check the sensitivity of our results to a change in the eligibility definition, which we report in Table 5.

Model (10) of Table 5 illustrates the results under a more restrictive 5% import share cutoff for eligibility, model (11) illustrates the results under a less restrictive 1% import share cutoff for eligibility, and model (12) illustrates the results under a rule in which the import share cutoff is 3% but we only consider observations in which there was an *increase* in the amount of the relevant products being imported into the U.S. (i.e. $C\_IMP > 0$).[26] An inspection of the results suggests no substantial changes in the estimated elasticities on the 'threat of foreign retaliation,' variables.

4.3 Using Industry-Level Exports in lieu of Product-Level Exports

The threat of foreign retaliation through foreign recourse to reciprocal ADDs facing multi-product U.S. firms may not be adequately captured by focusing only on exports within the same HTS product category. AD channel retaliation may occur in other products produced by the firm. Thus, as another robustness check, we consider a specification in which we substitute the *industry* level 4 digit SIC export variables in for the *product* level 8-10 digit HTS export variables that we have been considering previously.

The results presented in Table 6 provide evidence that the AD channel retaliation threat does extend beyond just the product subject to the U.S. AD action. As shown in the table, the AD channel variables in the naming stage show generally larger elasticities that are statistically stronger than those reported earlier using data connected with only the product subject to the U.S. AD action (compare again with Table 2), and further strengthens our evidence for the dampening effect of this channel of retaliation.

[26] Note that this results in changes in the number of observations in the industry's 'naming' decision to 1681, 2797 and 1790, respectively.

4.4 Economic Significance

Given that we have established that the estimates of the elasticities of interest appear fairly robust to subtle changes in the way we construct and aggregate the data, the next question of interest is whether or not these results have economic significance.

In Table 7 we report the results of an exercise in which we consider changes in the 'threat of foreign retaliation' variables, and we calculate the relative change in the probability of a positive AD decision by the U.S. AD authority and on the probability of the U.S. industry's decision of 'naming' a trading partner. The initial probabilities were determined from the mean values of the second-stage data, and we consider changes determined by one standard deviation increases in the underlying data on the variables of interest.[27]

For example, consider a one standard deviation increase in the size of the share of U.S. exports to a country which has been a plaintiff in a GATT/WTO trade dispute against the U.S. That is, for two otherwise identical trading partners in the average case, the one which receives 13.8% (as opposed to the mean of 5%) of U.S. exports will face an 10-12% lower probability that the AD authority will make a positive AD decision.[28] The probability difference is 3-4% when using the export levels measure, as opposed to export shares.

Next consider a one standard deviation increase in the size of the share of the petitioning U.S. industry's 8-10 digit HTS *product* exports to a country which has an active AD statute. In this case, for two otherwise identical trading partners in the average case, the one which receives 15.8% (as opposed to the mean of 4.4%) of the petitioning U.S. industry exports will face an 11-13% lower probability that it will be *named* in an AD petition.[29] The probability difference is 3-6% when using the export levels measure, as opposed to export shares.

Finally consider a one standard deviation increase in the size of the share of the petitioning U.S. 4 digit SIC *industry's* exports to a country which has an active AD statute. In this case, for two

[27]Note that the results on economic significance summarized here are generally taken from the models with the statistically largest elasticity estimates and hence, are giving an upperbound effect.

[28]For example, in model (2) the conditional probability of a positive AD decision at the means of the data was 58.1%. Ceteris paribus, a one standard deviation increase in the U.S. export share from the mean of 5.0% to 13.8% causes the conditional probability of a positive AD decision to fall to 52.5%.

[29]For example, in model (2) the probability that a foreign country will be 'named' when evaluated at the means of the data was 33.8%. Ceteris paribus, a one standard deviation increase in the product export share from the mean of 4.4% to 15.8% causes the probability that a foreign country will be named to fall to 29.5%.

otherwise identical trading partners in the average case, the one which receives 15.0% (as opposed to the mean of 4.8%) of the petitioning U.S. industry exports will face a 17-18% lower probability that it will be *named* in an AD petition.[30] The probability difference is 12% when using the export levels measure, as opposed to export shares.

In summary, we find economically meaningful dampening effects from these potential channels for retaliation, though they are by no means overwhelmingly large. These effects are obviously average effects over our entire sample of years. An interesting question we address next is whether these dampening effects may be increasing in importance as AD activity and GATT/WTO dispute settlement activity increase.

4.5 Growing Retaliation Threat Effects?

The potential for retaliation has been growing over the past decade. As documented by Miranda et al. (1998), Prusa (2001), and Lindsey and Ikenson (2001), the number of countries adopting and using AD laws began to rise substantially in the early 1990s with a concomitant increase in the frequency of AD cases against U.S. exporters. In addition, the GATT/WTO dispute settlement process only explicitly began to be used for AD matters in 1990, with the first panel report resulting from a formal AD-related dispute between the U.S. and Sweden over a U.S. steel AD duty (WTO 1995a).

Table 8 thus reports results where we interact our retaliation threat variables with dummy variables to allow for structural breaks with respect to each distinct retaliatory threat *channel.* Here we allow for a structural break with respect to the GATT/WTO channel in 1990 and with respect to the AD channel at 1993.[31] With these breaks, the estimated elasticity increases by about 50% on the GATT/WTO retaliation channel for the AD authority outcome, suggesting that the dampening effects on positive AD outcomes from this channel increased during the 1990-1998 period, as expected. Evidence for greater dampening effects from the AD channel on the naming decision across the two periods is much weaker. One possible explanation is that it takes time for U.S. firms to realize greater threats of retaliation as other countries adopt AD laws. Alternatively, it may be that the countries that are adopting AD laws in the 1990s (many of which are less-developed ones) may

[30] For example, in model (15) the probability that a foreign country will be 'named' when evaluated at the means of the data was 34.4%. Ceteris paribus, a one standard deviation increase in the industry export share from the mean of 4.8% to 15.0% causes the probability that a foreign country will be named to fall to 28.7%.

[31] Alternative, nearby break years give qualitatively similar but less precise estimates than those reported here.

not be ones where U.S. exporters have much export exposure.

On a final note, there certainly may be other channels of retaliation that our estimates are not capturing. One such channel may be retaliation through some other form of trade protection other than AD duties. This alternative may not be that significant in that many other forms of protection can require more political and economic costs to obtain and are likely not WTO-legal.

Another way in which retaliation threats may be having dampening effects on the AD process which we are not examining is the decision by the U.S. firms to petition against any import source in the first place. To gather data on all import product line codes to estimate the likelihood of a U.S. AD petition by these product codes and the effect of retaliation threats on that decision is a daunting task that we leave for future research efforts. Not modeling these effects in the current paper could create sample selection bias in our current estimates. This sample selection bias would likely occur because the domestic industry only petitions for product line codes where the threat of retaliation is generally low across the import sources in that product code. Such a sample selection bias would make it less likely to find retaliation effects in the steps of the AD process that we actually find.

5 Conclusion

This paper investigates how foreign retaliation threats affected filings and outcomes of U.S. AD cases from 1980 through 1998. We identify and investigate two different channels through which the threat of retaliation can affect different critical stages of the AD process, which we label the AD channel and the GATT/WTO channel.

We find evidence to suggest that U.S. industries are influenced by the threat of retaliation through the AD channel. In particular, U.S. industry is less likely to initiate petitions against firms from countries which have active AD provisions and to which the U.S. petitioning industry sends sizable exports. This is consistent with the theory that the industry is concerned with the capacity of the foreign firms to initiate AD investigations and retaliate with reciprocal ADDs.

We also find evidence to suggest that the U.S. AD authority is influenced by the threat of retaliation through the GATT/WTO channel. The U.S. AD authority tends to reject petitions against firms from countries that have experience as a plaintiff in GATT/WTO trade disputes against the U.S. and to whom the U.S. sends sizable exports. This is consistent with the theory that the

AD authority is using discretion when it is concerned with the capacity of GATT/WTO-sanctioned foreign retaliation in a potential formal trade dispute.

As noted in the introduction, these dampening effects are important and, perhaps counterintuitive with respect to recent literature concerned that more countries are adopting and using AD laws in the past decade. The dampening effects we estimate are economically significant, though obviously not large enough to eliminate worldwide AD activity. However, there is some evidence that these dampening effects grow in magnitude in the latter half of our sample, as AD activity by non-users and use of the GATT/WTO dispute settlement process grew. Thus, increased AD ability across countries and familiarity with the GATT/WTO dispute settlement process may ultimately help put the brakes on AD use by traditional users, leading to more of a "cold war" equilibrium rather than a larger conflagration of AD protectionism.

It is important to note that the magnitude of these dampening effects depends on how balanced retaliation threats are distributed across countries. Poorer, less-developed countries likely have more limited abilities to retaliate because other countries have relatively little exports to these countries. Such asymmetries may limit how much retaliation threats can dampen activity. However, if trade flows are symmetric enough, the possibility exists that a proliferation of AD activity across many countries may push countries to significantly limit or eliminate such AD laws within the WTO - the ultimate dampening mechanism.

Variable Definitions and Data Sources

- ***US_EXP***: Real (1992) value U.S. annual exports to the identified country. Data taken from Feenstra, Lipsey and Bowen (1997) and Feenstra (2000).
- ***US_EXPSHARE***: Ratio of U.S. annual exports to the identified country to U.S. total annual exports. Data taken from Feenstra, Lipsey and Bowen (1997) and Feenstra (2000).
- ***D_GATT/WTO***: Indicator if the foreign country is a GATT/WTO member at the time of the case. Data available from the WTO's website at http://www.wto.org/ .
- ***D_USPLAINT***: Indicator if the foreign country has ever been plaintiff to a formal GATT/WTO trade dispute filed against the U.S. Data taken from Bown (2000).
- ***D_PLAINT***: Indicator if the foreign country has ever been plaintiff to a formal GATT/WTO dispute filed against any country. Data taken from Bown (2000).
- ***IN_EXP***: Real (1992) value U.S. 4-digit SIC industry annual exports to the identified country. Data taken from Feenstra (1997) and USITC (2001).
- ***IN_EXPSHARE***: Ratio of U.S. 4-digit SIC annual exports to the identified country to US4-digit SIC total annual exports. Data taken from Feenstra (1997) and USITC (2001).
- ***PR_EXP***: Real (1992) value U.S. 8-10 digit HTS annual product exports to the identified country for 1989-98, and 5-7 digit Schedule B exports for 1980-88. Data taken from Feenstra (1997) and USITC (2001).
- ***PR_EXPSHARE***: Ratio of U.S. 8-10 digit HTS annual exports to the identified country to U.S. 8-10 digit HTS total annual exports for 1989-98, and 5-7 digit Schedule B exports for 1980-88. Data taken from Feenstra (1997) and USITC (2001).
- ***D_FORAD***: Indicator if the foreign country has an active AD statute. Data taken from Miranda, Torres and Ruiz (1998).
- ***IMPSHARE***: Ratio of annual U.S. HTS (8-10 digit for 1989-1998) or TSUSA (5-7 digit for 1980-1988) imports from the foreign country to the total annual U.S. HTS/TSUSA imports. HTS/TSUSA tariff line codes taken from *Federal Register* (various issues). U.S. HTS/TSUSA import data taken from Feenstra (1996) and USITC (2001).
- ***C_IMP***: Growth rate in the real (1992) value of U.S. HTS/TSUSA imports from the foreign country from the previous year. Data taken from Feenstra (1996) and USITC (2001).
- ***TARIFF***: U.S. industry's pre-investigation tariff level. For 1980-88, the data is 4-digit SIC average tariff level obtained from Tom Prusa. For 1989 and after, the data is taken to be the 8 or 10 digit 1994 average HTS tariff taken from USITC (2001).
- ***D_CUMULATE***: Indicator if a case was 'cumulated.' Data obtained from Tom Prusa.
- ***D_STEEL***: Indicator if the U.S. industry is in the steel sector.

- ***CONC***: Four firm concentration ratio. Data taken from the U.S. Bureau of the Census', *Census of Manufactures, Concentration Ratios in Manufacturing.*
- ***EMP***: 4-digit SIC industry employment. Data taken from Bartelsman, Becker and Gray's (2000) NBER Manufacturing Industry Productivity Database.
- ***C_EMP***: Yearly change in 4-digit SIC industry employment. Data taken from Bartelsman, Becker and Gray's (2000) NBER Manufacturing Industry Productivity Database.
- ***C_CAP***: Yearly change in the 4-digit SIC industry capacity utilization rate. Data taken the U.S. Bureau of the Census, *Current Industrial Reports, Survey of Plant Capacity.* 'Practical rate' used for 1980-88, 'full production rate' used for 1989 and after (discontinuation of 'practical rate' series).
- ***UNEMRATE***: U.S. national unemployment rate, taken from the *Economic Report of the President.*
- ***D_PRE_1990***: Indicator if the year of the case was before 1990.
- ***D_POST_1989***: Indicator if the year of the case was after 1989.
- ***D_PRE_1993***: Indicator if the year of the case was before 1993.
- ***D_POST_1992***: Indicator if the year of the case was after 1992.

Appendix

This appendix summarizes the theoretical model in Blonigen (2000). Following Brander and Krugman (1983), assume there are two countries, home and foreign with one firm in each country producing the identical good, Q. The firms compete in quantities in both markets, and we denote firms' quantities as q_i^j, where i indexes the market ("h" for home and "f" for foreign) and j indexes the firm ("h" or "f"). Price in the home and foreign markets are a function of the total quantity supplied by each firm to that market, $P_h(Q_h)$ and $P_f(Q_f)$, respectively, where $Q_h = q_h^h + q_h^f$ and $Q_f = q_f^h + q_f^f$. Marginal cost for each firm is a constant, c^i, where $i = h, f$. There are transport costs of the "iceberg" type when a firm in one country sells its product in the other country, such that it's marginal cost for these cross-border transactions is c^i/g, where $0 < g < 1$. Given this setup, the markets are segmented and each firm's decision for its optimal quantity for one market is independent of it's optimal quantity choice for the other market. It also means that one can solve separately for the Nash equilibrium quantities in each market.

We now extend this basic model to consider the occurrence of AD petitions in the two countries. First, assume the ability of each firm to petition for an AD duty on its rival, τ, for a cost of K. Also, assume that the probability of success of the AD petition is an increasing function of the ratio of the importing firm's quantity to the domestic firm's quantity in the previous period, which is denoted by $\phi_h(q_h^f/Q_{h)}$ for the home market and $\phi_f(q_f^h/Q_f)$, where $0 \leq \phi_h(.) \leq \phi_f(.) \leq 1$. This functional form of the AD duty probability is intended to reflect the injury determination in the AD investigation since this is the main hurdle in real-life AD investigations. To allow for the possibility of retaliation consider an infinitely repeated two-stage game each period where the firms in each country play a game in quantities in the first stage and then each firm decides whether to file an AD petition or not. If filed, an AD duty, τ, with probability $\phi_i(.)$ comes into effect the subsequent period. Consequently, each period the firm has the decision to petition for AD protection, which (if successful) leads to an AD duty, or to not petition for AD protection, which leads to no duty or the removal of a duty, if one was in place in the previous period.

Given this repeated game, the strategy most commonly discussed to achieve a cooperative outcome, whereby neither firm files and both avoid AD protection in their export market, is the trigger (or grim) strategy. With such a strategy, we assume both firms begin by not petitioning and then

choose to continue with that strategy unless the other firm files an AD petition, whereupon they retaliate and file an AD petition every subsequent period. As is well-known, such a trigger strategy can support a cooperative equilibrium only if the punishment is large enough for each firm that it outweighs the gains from deviating. Focusing on the home firm without loss of generality because of the symmetry of this model, this would imply that the home firm would not deviate from the cooperative equilibrium by filing for an AD petition, provided that in any given period (t),

$$\delta\phi_h(\cdot)(\hat{\Pi}_h^h - \Pi_h^{*h}) - K < \sum_{t=2} \delta^t \phi_f(\cdot)(\Pi^{*h} - \hat{\Pi}_f^h) \tag{5}$$

where $0 < \delta \leq 1$ denotes the discount factor, $\hat{\Pi}_h^h$ is the home firm's profits in the home market when it has an AD duty in place, Π_h^{*h} is the home firm's profits in the home market when it does not have an AD duty in place, Π_h^{*f} is the home firm's profits in the foreign market when there it does not face an AD duty in the foreign market, and $\hat{\Pi}_h^f$ is the home firm's profits in the foreign market when there it does face an AD duty in the foreign market. The lefthand side of (5) is the expected gains in additional profit the home firm can make in the home market from deviating in a current period by filing for AD protection that begins next period. The righthand side of (5) represents the expected losses in profits in the foreign market once the foreign firm retaliates by adopting the strategy of always filing for AD protection beginning in the following period. Thus, depending on the parameters of the model, we have a simple setting where the threat of retaliation may matter for whether we see AD petitions. In fact, the higher the expected loss from retaliation, the more likely a cooperative outcome from use of strategies such as the grim strategy, and the less likely we are to see AD petitions being filed.

Given this model, we can examine alternative scenarios that generate predictions for the empirical estimation. First, it is trivial to see that if the foreign country does not have AD laws in this game, the threat of retaliation is zero. This means that the righthand side of (5) becomes zero, making it more likely the home firm will petition for AD protection. Second, suppose AD laws are in place in the foreign country and that with symmetric costs the firms are able to attain the cooperative equilibrium via trigger strategies, such that the condition in (5) is satisfied for both firms; i.e., no AD petitions are filed in either market. Now suppose the home firm has a cost disadvantage where $c^h > c^f$. This obviously alters optimal quantities and profits so that the condition in (5) may or may not hold. With respect to the home firm, their market share in both markets will go down.

This means that the probability of a successful petition in the home market increases, while the probability of a successful petition by the foreign firm against the home firm falls. Likewise, the profit gain from an AD duty goes up in the home market, while the profit loss from facing an AD duty in the foreign market goes down. These effects all work toward making it more likely that the condition in (5) is not satisfied, and the home firms deviates and files an AD petition. Intuitively, a cost disadvantage raises the potential profit gain of an AD duty in the home market for the home firm, while lowering its exposure to retaliation (and profit loss) in the foreign market.

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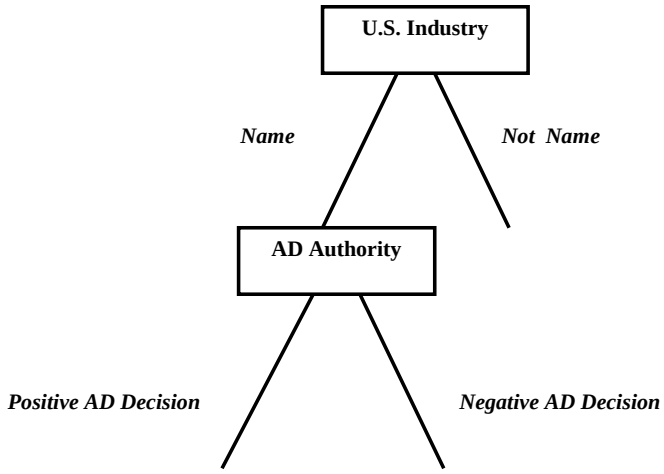

Figure 1: The Decision Tree of the U.S. AD Process, Given that a Petition Has Been Filed

Table 1: Summary Statistics for some Covariates of the Two-Staged Model

Stage 1 : **Covariate** [expected sign of elasticity estimate]	**Y_1 = 'Named'** **Mean**	**Stage 2 :** **Covariate** [expected sign of elasticity estimate]	**Y_2 = 'Positive AD Decision'** **Mean**
US_EXPSHARE • D_USPLAINT [-]	0.0628	US_EXPSHARE • D_USPLAINT [-]	0.0496
US_EXP • D_USPLAINT [-]	0.0130 ($1.3 billion)*	US_EXP • D_USPLAINT [-]	0.0210 ($2.1 billion)*
PR_EXPSHARE • D_FORAD [-]	0.0618	PR_EXPSHARE • D_FORAD [-]	0.0441
PR_EXP • D_FORAD [-]	0.0560 ($56 million)*	PR_EXP • D_FORAD [-]	0.0344 ($34 million)*
IN_EXPSHARE • D_FORAD [-]	0.0688	IN_EXPSHARE • D_FORAD [-]	0.0475
IN_EXP • D_FORAD [-]	0.0207 ($207 million)*	IN_EXP • D_FORAD [-]	0.0127 ($127 million)*
IMPSHARE [+]	0.1507	IMPSHARE [+]	0.1978
C_IMP [+]	0.049**	C_IMP [+]	0.068**
Observations :	*2015*	TARIFF [-]	0.0439
		D_CUMULATE [+]	0.5612
		D_STEEL [+]	0.5457
		CONC [+]	36.76
		EMP [+]	1.1807
		C_EMP [-]	-0.0323
		C_CAP [-]	0.0018
		UNEMRATE [+]	6.9192
		Observations :	*645*

*1992 dollars
**Median values

Table 2: Maximum Likelihood Results: Estimated Elasticities in the Two-Staged Nested-Logit Model

Stage 1 with Y_1=1 is 'Named'	(1)	(2)	(3)
US_EXPSHARE • D_USPLAINT	-0.308 (0.28)	---	---
US_EXP • D_USPLAINT	---	---	---
PR_EXPSHARE • D_FORAD	-0.254 (0.20)	-0.373‡ (0.17)	---
PR_EXP • D_FORAD	---	---	-0.038 (0.05)
IMPSHARE	0.494‡ (0.12)	0.461‡ (0.12)	0.437‡ (0.11)
C_IMP	-0.398 (0.35)	-0.423 (0.32)	-0.348 (0.31)
I_{NAME}	0.258* (0.08)	0.314* (0.08)	0.218* (0.08)
CONSTANT	-0.218‡ (0.04)	-0.227‡ (0.04)	-0.242‡ (0.03)
Observations	2015	2015	2015

Stage 2 with Y_2=1 is 'Positive AD Decision'	(1)	(2)	(3)
US_EXPSHARE • D_USPLAINT	-1.439‡ (0.32)	-1.414‡ (0.31)	---
US_EXP • D_USPLAINT	---	---	-0.335† (0.17)
PR_EXPSHARE • D_FORAD	0.102 (0.31)	---	---
PR_EXP • D_FORAD	---	---	---
IMPSHARE	1.041‡ (0.14)	1.091‡ (0.14)	0.928‡ (0.14)
C_IMP	1.222‡ (0.54)	1.272‡ (0.54)	1.181‡ (0.53)
TARIFF	1.138 (0.87)	1.199 (0.86)	1.056 (0.86)
D_CUMULATE	0.177‡ (0.06)	0.185‡ (0.06)	0.156‡ (0.06)
D_STEEL	0.268‡ (0.06)	0.281‡ (0.06)	0.271‡ (0.06)
CONC	-0.002 (0.00)	-0.002 (0.00)	-0.003 (0.00)
EMP	0.165‡ (0.03)	0.172‡ (0.03)	0.165‡ (0.03)
C_EMP	0.066 (0.37)	-0.078 (0.37)	0.014 (0.37)
C_CAP	-0.875‡ (0.21)	-0.911‡ (0.21)	-0.796‡ (0.21)
UNEMRATE	-0.030 (0.02)	-0.032 (0.02)	-0.040 (0.02)
CONSTANT	-0.175 (0.20)	-0.185 (0.20)	-0.101 (0.20)
Observations	645	645	645

Notes: (i) standard errors in parentheses

(ii) ‡ and † indicate |t|>2 and 2>|t|>1.5, respectively, and the MLE is of the predicted sign.

(iii) * the numbers reported for the inclusive values are the parameter estimates and not elasticities.

Table 3: Maximum Likelihood Results: Estimated Elasticities in the Two-Staged Nested-Logit Model (cont)

Stage 1 with Y_1=1 is 'Named'	(4)	(5)	(6)	Stage 2 with Y_2=1 is 'Positive AD Decision'	(4)	(5)	(6)
US_EXPSHARE • D_PLAINT	---	---	---	US_EXPSHARE • D_PLAINT	-1.127‡ (0.33)	---	---
US_EXPSHARE • D_GATT/WTO	---	---	---	US_EXPSHARE • D_GATT/WTO	---	-1.232‡ (0.33)	---
US_EXP SHARE • D_USPLAINT	---	---	---	US_EXP SHARE • D_USPLAINT	---	---	-1.317‡ (0.33)
PR_EXPSHARE • D_FORAD	-0.385‡ (0.17)	-0.389‡ (0.17)	-0.306† (0.17)	PR_EXPSHARE • D_FORAD	---	---	---
IMPSHARE	0.454‡ (0.12)	0.455‡ (0.11)	0.404‡ (0.12)	IMPSHARE	1.156‡ (0.14)	1.149‡ (0.14)	1.038‡ (0.14)
C_IMP	-0.438 (0.32)	-0.437 (0.31)	-0.489 (0.33)	C_IMP	1.270‡ (0.54)	1.268‡ (0.54)	1.214‡ (0.54)
I_{NAME}	0.350* (0.08)	0.346* (0.09)	0.339* (0.09)	TARIFF	1.185 (0.87)	1.199 (0.87)	2.459‡ (0.96)
CONSTANT	-0.226‡ (0.04)	-0.226‡ (0.02)	-0.227‡ (0.04)	D_CUMULATE	0.187‡ (0.06)	0.185‡ (0.06)	0.254‡ (0.06)
Observations	2015	2015	1928	D_STEEL	0.281‡ (0.06)	0.279‡ (0.06)	0.268‡ (0.06)
				CONC	-0.002 (0.00)	-0.003 (0.00)	-0.000 (0.00)
				EMP	0.178‡ (0.03)	0.178‡ (0.03)	0.208‡ (0.03)
				C_EMP	0.083 (0.37)	-0.080 (0.37)	-0.266 (0.40)
				C_CAP	-0.883‡ (0.21)	-0.888‡ (0.21)	-0.831‡ (0.22)
				UNEMRATE	-0.033 (0.02)	-0.032 (0.02)	-0.026 (0.02)
				CONSTANT	-0.170 (0.20)	-0.168 (0.20)	-0.457‡ (0.22)
				Observations	645	645	645

Notes: (i) standard errors in parentheses

(ii) ‡ and † indicate $|t|>2$ and $2>|t|>1.5$, respectively, and the MLE is of the predicted sign.

(iii) * the numbers reported for the inclusive values are the parameter estimates and not elasticities.

Table 4: Estimated Elasticities for an Alternative Formulation of the Second-Stage Dependent Variable

Stage 1 with Y_1=1 is 'Named'	(7)	(8)	(9)	Stage 2 with Y_2=1 is 'Positive AD Decision'	(7)	(8)	(9)
US_EXPSHARE • D_USPLAINT	-0.229 (0.28)	---	---	US_EXPSHARE • D_USPLAINT	-1.331‡ (0.43)	---	-1.904‡ (0.34)
US_EXP • D_USPLAINT	---	0.166 (0.14)	---	US_EXP • D_USPLAINT	---	-0.311† (0.18)	---
PR_EXPSHARE • D_FORAD	-0.132 (0.20)	---	-0.303‡ (0.17)	PR_EXPSHARE • D_FORAD	-0.682‡ (0.33)	---	---
PR_EXP • D_FORAD	---	-0.030 (0.06)	---	PR_EXP • D_FORAD	---	-0.021 (0.08)	---
IMPSHARE	0.406‡ (0.12)	0.371‡ (0.11)	0.400‡ (0.12)	IMPSHARE	1.344‡ (0.15)	1.140‡ (0.14)	1.321‡ (0.15)
C_IMP	-0.520 (0.32)	-0.464 (0.32)	-0.529 (0.32)	C_IMP	1.547‡ (0.57)	1.495‡ (0.56)	1.573‡ (0.57)
I_{NAME}	0.523* (0.11)	0.463* (0.10)	0.538* (0.10)	TARIFF	1.273 (0.91)	1.000 (0.91)	1.210 (0.91)
CONSTANT	-0.202‡ (0.04)	-0.225‡ (0.02)	-0.206‡ (0.05)	D_CUMULATE	0.324‡ (0.07)	0.281‡ (0.07)	0.323‡ (0.07)
Observations	2015	2015	2015	D_STEEL	0.304‡ (0.06)	0.293‡ (0.06)	0.297‡ (0.06)
				CONC	-0.003 (0.00)	-0.005 (0.00)	-0.004 (0.00)
				EMP	0.183‡ (0.03)	0.184‡ (0.03)	0.187‡ (0.03)
				C_EMP	0.159 (0.39)	-0.032 (0.38)	-0.095 (0.39)
				C_CAP	-0.930‡ (0.22)	-0.815‡ (0.22)	-0.952‡ (0.22)
				UNEMRATE	-0.037 (0.03)	-0.046 (0.02)	-0.036 (0.02)
				CONSTANT	-0.316‡ (0.21)	-0.202 (0.20)	-0.298 (0.21)
				Observations	645	645	645

Notes: (i) standard errors in parentheses

(ii) ‡ and † indicate |t|>2 and 2>|t|>1.5, respectively, and the MLE is of the predicted sign.

(iii) * the numbers reported for the inclusive values are the parameter estimates and not elasticities.

Table 5: Estimated Elasticities under Alternative Eligibility Requirements for Determining 'Non-Named' Firms

Stage 1 with Y_1=1 is 'Named'	(10)	(11)	(12)	Stage 2 with Y_2=1 is 'Positive AD Decision'	(10)	(11)	(12)
US_EXPSHARE • D_USPLAINT	---	---	---	US_EXPSHARE • D_USPLAINT	-1.395‡ (0.32)	-1.486‡ (0.32)	-1.365‡ (0.32)
PR_EXPSHARE • D_FORAD	-0.490‡ (0.18)	-0.210 (0.16)	-0.398† (0.17)	PR_EXPSHARE • D_FORAD	---	---	---
IMPSHARE	0.244‡ (0.12)	0.628‡ (0.13)	0.478‡ (0.12)	IMPSHARE	1.077‡ (0.14)	1.147‡ (0.14)	1.053‡ (0.14)
C_IMP	-0.434 (0.35)	-0.432 (0.26)	-0.579 (0.32)	C_IMP	1.255‡ (0.54)	1.337‡ (0.54)	1.228‡ (0.54)
I_{NAME}	0.327* (0.08)	0.337* (0.10)	0.284* (0.09)	TARIFF	1.183 (0.87)	1.260† (0.87)	1.157 (0.86)
CONSTANT	-0.141‡ (0.04)	-0.282‡ (0.02)	-0.198‡ (0.04)	D_CUMULATE	0.182‡ (0.06)	0.194‡ (.06)	0.178‡ (.06)
Observations	1681	2797	1790	D_STEEL	0.277‡ (0.06)	0.295‡ (0.06)	0.271‡ (0.06)
				CONC	-0.002 (0.00)	-0.002 (0.00)	-0.002 (0.00)
				EMP	0.169‡ (0.03)	0.180‡ (0.03)	0.166‡ (0.03)
				C_EMP	0.077 (0.37)	-0.082 (0.37)	-0.075 (0.37)
				C_CAP	-0.898‡ (0.21)	-0.957‡ (0.21)	-0.879‡ (0.21)
				UNEMRATE	-0.031 (0.02)	-0.033 (0.02)	-0.031 (0.02)
				CONSTANT	-0.182 (0.20)	-0.194 (0.20)	-0.179 (0.20)
				Observations	645	645	645

Notes: (i) standard errors in parentheses

(ii) ‡ and † indicate |t|>2 and 2>|t|>1.5, respectively, and the MLE is of the predicted sign.

(iii) * the numbers reported for the inclusive values are the parameter estimates and not elasticities.

Table 6: Estimated Elasticities with Industry Exports in lieu of Product Exports

Stage 1 with Y_1=1 is 'Named'	(13)	(14)	(15)	Stage 2 with Y_2=1 is 'Positive AD Decision'	(13)	(14)	(15)
US_EXPSHARE • D_USPLAINT	-0.039 (0.34)	---	---	US_EXPSHARE • D_USPLAINT	-1.422‡ (0.48)	---	-1.340‡ (0.32)
US_EXP • D_USPLAINT	---	0.193 (0.15)	---	US_EXP • D_USPLAINT	---	-0.368‡ (0.18)	---
IN_EXPSHARE • D_FORAD	-0.527 (0.29)	---	-0.546‡ (0.20)	IN_EXPSHARE • D_FORAD	0.099 (0.40)	---	---
IN_EXP • D_FORAD	---	-0.677† (0.44)	---	IN_EXP • D_FORAD	---	0.479 (0.52)	---
IMPSHARE	0.503‡ (0.12)	0.437‡ (0.12)	0.499‡ (0.12)	IMPSHARE	1.027‡ (0.14)	0.946‡ (0.13)	1.034‡ (0.14)
C_IMP	-0.387 (0.31)	-0.368 (0.31)	-0.390 (0.31)	C_IMP	1.202‡ (0.54)	1.204‡ (0.53)	1.206‡ (0.54)
I_{NAME}	0.237* (0.09)	0.244* (0.08)	0.243* (0.08)	TARIFF	1.131 (0.87)	1.123 (0.87)	1.136 (0.87)
CONSTANT	-0.216‡ (0.03)	-0.235‡ (0.04)	-0.217‡ (0.04)	D_CUMULATE	0.174‡ (0.06)	0.162‡ (0.06)	0.175‡ (0.06)
Observations	2015	2015	2015	D_STEEL	0.265‡ (0.06)	0.283‡ (0.06)	0.266‡ (0.06)
				CONC	-0.002 (0.00)	-0.003 (0.00)	-0.002 (0.00)
				EMP	0.162‡ (0.03)	0.166‡ (0.03)	0.163‡ (0.03)
				C_EMP	0.067 (0.37)	-0.018 (0.37)	-0.074 (0.37)
				C_CAP	-0.861‡ (0.21)	-0.806‡ (0.21)	-0.863‡ (0.21)
				UNEMRATE	-0.030 (0.02)	-0.039 (0.02)	-0.030 (0.02)
				CONSTANT	-0.175 (0.20)	-0.124 (0.20)	-0.175 (0.20)
				Observations	645	645	645

Notes: (i) standard errors in parentheses

(ii) ‡ and † indicate |t|>2 and 2>|t|>1.5, respectively, and the MLE is of the predicted sign.

(iii) * the numbers reported for the inclusive values are the parameter estimates and not elasticities.

Table 7: Estimated Probability Changes Due to Changes in the 'Retaliatory Threat' Variables

Hypothetical Change	**Change in Conditional Probability of a Positive AD Decision, given that the Country has been Named**	
Increase in share of US exports to a trading partner who has been a plaintiff in a GATT/WTO dispute against the US to 13.8% [5.0%]	-10.22% (2)	-12.52% (9)
Increase in real US exports to a trading partners who has been a plaintiff in a GATT/WTO dispute against the US to $17.8 billion [$2.1 billion]	-4.40% (3)	-3.63% (8)
Hypothetical Change	**Change in Probability of Being Named**	
Increase in share of US industry petitioner's 8-10 digit HTS *product* exports to a trading partner country who has an active AD statute to 15.8% [4.4%]	-13.67% (2)	-11.18% (9)
Increase in real value of US industry petitioner's 8-10 digit HTS *product* exports to a trading partner who has an Active AD statute to $386 million [$34 million]	-5.75% (3)	-3.29% (8)
Increase in share of US industry petitioner's 4 digit SIC *industry* exports to a trading partner country who has an active AD statute to 15.0% [4.8%]	-17.37% (13)	-18.03% (15)
Increase in real value of US industry petitioner's 4 digit SIC *industry* exports to a trading partner who has an Active AD statute to $695 million [$127 million]		-11.84% (14)

Notes: Sample means in brackets
(N) indicates based on model *N*, for example, (3) is based on specification (3) of Table 2

Table 8: Estimated Elasticities Allowing for Breaks in the AD and GATT/WTO Retaliation Threat Channels

Stage 1 with Y_1=1 is 'Named'	(16)	(17)	Stage 2 with Y_2=1 is 'Positive AD Decision'	(16)	(17)
US_EXPSHARE • D_USPLAINT	---	---	US_EXPSHARE • D_USPLAINT • D_PRE_1990	-1.282‡ (0.40)	-1.218‡ (0.40)
US_EXPSHARE • D_USPLAINT	---	---	US_EXPSHARE • D_USPLAINT • D_POST_1989	-1.853‡ (0.45)	-1.761‡ (0.45)
PR_EXPSHARE • D_FORAD • D_PRE_1993	-0.349† (0.18)	---	PR_EXPSHARE • D_FORAD	---	---
PR_EXPSHARE • D_FORAD • D_POST_1992	-0.410 (0.36)	---	PR_EXPSHARE • D_FORAD	---	---
IN_EXPSHARE • D_FORAD • D_PRE_1993	---	-0.528‡ (0.22)	IN_EXPSHARE • D_FORAD	---	---
IN_EXPSHARE • D_FORAD • D_POST_1992	---	-0.528 (0.38)	IN_EXPSHARE • D_FORAD	---	---
IMPSHARE	0.452‡ (0.12)	0.489‡ (0.12)	IMPSHARE	1.105‡ (0.14)	1.105‡ (0.14)
C_IMP	-0.442 (0.32)	-0.409 (0.32)	C_IMP	1.302‡ (0.53)	1.238‡ (0.54)
I_{NAME}	0.357* (0.09)	0.286* (0.09)	TARIFF	0.947 (0.88)	0.899 (0.88)
CONSTANT	-0.227‡ (0.04)	-0.217‡ (0.04)	D_CUMULATE	0.195‡ (0.06)	0.186‡ (0.06)
Observations	2015	2015	D_STEEL	0.291‡ (0.06)	0.276‡ (0.06)
			CONC	-0.002 (0.00)	-0.002 (0.00)
			EMP	0.173‡ (0.03)	0.164‡ (0.03)
			C_EMP	0.227 (0.37)	0.216 (0.37)
			C_CAP	-0.864‡ (0.21)	-0.821‡ (0.21)
			UNEMRATE	-0.041 (0.02)	-0.039 (0.02)
			CONSTANT	-0.550 (0.27)	-0.102 (0.20)
			Observations	645	645

Notes: (i) standard errors in parentheses

(ii) ‡ and † indicate |t|>2 and 2>|t|>1.5, respectively, and the MLE is of the predicted sign.

(iii) * the numbers reported for the inclusive values are the parameter estimates and not elasticities.