Sanctuary Markets and Antidumping:

An Empirical Analysis of U.S. Exporters

Abstract

Antidumping proponents in the U.S. often argue that foreign firms use profits obtained behind home market barriers to "subsidize" "unfair" pricing abroad. This paper examines this "sanctuary market" hypothesis for antidumping petitions against U.S. manufacturing exporters. Econometric results suggest that there is little evidence that U.S. manufacturing firms facing antidumping actions abroad are beneficiaries of a home market sanctuary during the 1994-2007 time period. Instead, U.S. firms in capital-intensive sectors that are successful exporters are more likely to face antidumping petitions abroad. This evidence suggests that current antidumping rules need reform so that firms not benefitting from sanctuary markers may avoid antidumping actions.

Michael Moore
Department of Economics/Elliott School
Institute for International Economic Policy
George Washington University
Email: mom@gwu.edu

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Introduction

Proponents of antidumping duty procedures have pointed to a number of justifications for their inclusion in the World Trade Organization (WTO) system. Chief among them is the long-standing "sanctuary market" hypothesis. The basic idea is that formal and informal barriers to competition in the home market will result in excessive profits that in turn allow an exporting firm to price "unfairly" in foreign markets and thereby lead to material injury to domestic firms in the importing country. This behavior, so the argument goes, is a justification for antidumping procedures as allowed under Article VI of the General Agreement on Tariffs and Trade.

This argument is heard especially often in the United States where support for antidumping procedures traditionally has been very strong. Many commentators in the 1980s, for example, accused the Japanese government of turning a blind eye towards anti-competitive actions of domestic firms, which in turned allegedly allowed these firms to take market share away from U.S. companies that were operating in a highly competitive domestic market that was subject to vigorous anti-trust enforcement. In the 1980s, the U.S. steel industry and its allies argued that much of the import competition it faced was "subsidized" by market sanctuaries in Japan and Europe (Howell, *et al*, 1988). The American Iron and Steel Institute continues to argue that U.S. steel makers "cannot compete against foreign governments that do not abide by international trade rules."[1]

The sanctuary market argument often plays a very important role in the U.S. government's justification for resisting significant WTO antidumping reform. Members

[1]American Iron and Steel Institute (http://www.steel.org/en/Public%20Policy/Trade.aspx) Accessed on December 13, 2012.

of Congress and import competing industries refer to the market sanctuary argument as a fundamental problem in the international trading system that justifies the continued and largely unreformed antidumping system currently in place. In recent years, official U.S. negotiating positions in the Doha Round of WTO negotiations also refer to sanctuary arguments as a primary basis for the existence of antidumping rules in the international trading system.

For example, the U.S. government formally submitted a paper to the WTO that outlined its view of the "basic concepts" behind antidumping in the international trading system:

> [K]ey aspects of the economic system supported by government inaction can enable injurious dumping to take place… For instance, these policies may allow producers to earn high profits in a home "sanctuary market," which may in turn allow them to sell abroad at an artificially low price. Such practices can result in injury in the importing country since domestic firms may not be able to match the artificially low prices from producers in the sanctuary market. (U.S., 2002)

Greg Mastel, a former senior staff member on the Senate Finance Committee, with principal jurisdiction over international trade, and a prominent U.S. supporter of antidumping published a book in 1998 that contained some of the major arguments in favor of the procedure. For example, he contends that high import barriers play a critical role in antidumping initiations:

> [The] high correlation between antidumping complaints and closed home markets is more than coincidence. A closed market allows companies to charge high prices at home because they face no foreign competition. Foreign companies can use the profits from these domestic sales to cross-subsidize export sales at dumped prices. (Mastel, p. 41, 1998)

Despite the frequency of such arguments, no systematic effort has ever been made to assess whether there is any evidence that exporters that benefit from sanctuary markets are more likely to face dumping allegations under the trade remedy laws. This lack of research in part reflects the fact that the GATT agreements have never required evidence of uncompetitive domestic market structure as part of an antidumping action. Instead, governments need only show that imports are "dumped" (either sold below home market prices or below production costs) and that those imports cause "material injury" to the import-competing domestic industry. In short, evidence about a "market sanctuary" is simply irrelevant to antidumping procedures in practice.

Another reason for the lack of study is that one must get detailed information about the structure of the exporting country industries in order to assess these arguments, data that are often difficult to obtain. Moreover, antidumping advocates in the U.S., for example, may not feel that detailed official Japanese or Chinese industrial data are reliable in any event. Even if one were to try to examine a wide variety of exporters into the U.S., domestic data would be gathered using different methodologies in various countries. Thus, it would be difficult to examine U.S. antidumping actions that involved tens of exporting countries around the world.

This research will examine whether there is any evidence that exporting industries with features consistent with the market sanctuary hypothesis are more likely to face antidumping petitions than other industries. In order to avoid some of the problems noted above, I will examine the experience of U.S. exporters in the antidumping process in other countries.

This approach has a number of advantages. The first is that examining only one exporting country will assure a consistent methodology for any official statistics used in the study. The second is that most analysts consider official U.S. data to be reasonably reliable or at least not systematically biased. Thirdly, the results of the study may have particular relevance to antidumping proponents in the U.S. who would be familiar with industrial structure and government policy in their own market. Finally, the now widely acknowledged spread of antidumping actions to many jurisdictions means that understanding the determinants of antidumping petitions against U.S. exporters will have particular relevance to U.S. policy-makers.

There is a wide range of U.S. exporters that have been caught up in antidumping actions abroad. Familiar large companies such as AK Steel, Brystol-Meyer-Squib, Dow Chemicals, Whirlpool, Amana, and Duracell show up among the cases compiled by Bown (2012). But one also finds smaller firms such as Firestone Building Products, Roosevelt Paper Company, and Daramic as well as agricultural producers like Georgetown Farmers Elevator, Ruskin Vegetable Corporation, and Northern Beef Industries. The picture is further complicated by the presence of foreign firms producing in the U.S. and that export to third markers, e.g. Bayer Chemical, Matsushita, and Formosa Plastics.

Table 1 includes some basic information about antidumping actions targeting U.S. exporters from 1978 through 2010.[2] Note that this table only includes petitions initiated and does not include information on products for which there are final antidumping duties were imposed. We see that there have been individual 382 petitions brought

[2] This information is based on Bown (2012).

against U.S. exporting firms by importing country governments for the entire period. NAFTA partners Mexico and Canada are the most frequent initiators of antidumping actions against U.S. companies for the entire period with 79 and 67 petitions, respectively, followed by Brazil (42 cases), and India (34 cases) and China (32 cases). One notable aspect of this information is how the countries targeting U.S. firms have changed over the last few decades. In the earlier period of 1978-1992, the total number of antidumping actions against U.S. exporters by three traditional users (Canada, Australia, and the EU) equaled all other nations in the world combined (60 vs. 61 petitions). For the 1993-2003 period, the new users initiated antidumping actions against U.S. firms 3.5 times as many as traditional users (140 vs. 40). In the 2004-2010 time frame, this ratio had risen to over 4 (65 vs. 16).

From 1978 through 1992, Canada and Mexico were the most active nations filing antidumping petitions against U.S. firms; Brazil, India, and China rarely initiated antidumping actions against the U.S. (or against any other countries' firms for that matter). From 2004 through 2010, these three emerging markets targeted U.S. firms far more frequently. China's increased activity is particularly notable. This increased use of antidumping by three of the "BRIC" countries (with only Russia not represented) should cause concern among U.S. multinational companies and U.S. policymakers about possible increased restrictions to American exports.

The basic approach of this study is to combine variables identified in the existing literature on determinants of antidumping petitions with regressors consistent with the market sanctuary hypothesis. The econometric model is based on work by Moore and Zanardi (2011), who estimate the probability of observing a new antidumping petition

based on country-industry pairs and control for imports, a number of macroeconomic conditions, and reactions against other countries' antidumping actions. The current work will expand on that study by including detailed industry information available from the U.S. Commerce's Census of Manufacturing. These latter variables (all at the six digit North American Industrial Classification Schedule (NAICS) code level) will include standard measures of industrial concentration, measures of high entry and exit costs in the industry, and U.S. sectoral tariffs**.**

The time period analyzed in the formal empirical work will be from 1994 through 2007. This beginning date coincides the start of WTO antidumping rules as part of the Uruguay Round negotiations completed in 1994. The latter date reflects a decision not to include the impact of the financial crisis that began in 2008. Note that the analyzed period will include a large majority of cases brought against the U.S. as well as the actions of some of the new users of antidumping.

The null hypothesis for the research is that trade flows and macro conditions will play an important role in explaining filings against U.S. exporters but that variables consistent with the sanctuary market argument (e.g. U.S. applied tariffs that restrict foreign imports, high entry costs, and measures of sectoral competitiveness) will also help predict antidumping petitions. Econometric evidence consistent with this hypothesis would be supportive of the view that antidumping procedures were working as intended by U.S. supporters. If these market sanctuary regressors are not helpful in predicting antidumping petitions, then one could argue that, at least for U.S. exporters, antidumping measures are not directed at industries that plausibly use excessive domestic profits to price aggressively abroad. Instead, antidumping actions against U.S. firms could be

interpreted as mere protectionism and which may undercut the argument that antidumping solely targets "unfair" trade.

The rest of the paper is organized in the following way. Section 1 includes a brief literature review and a short analysis of the market sanctuary argument. Section 2 lays out some of the basic statistics and patterns of antidumping actions taken against U.S. exporters. This section also will include a brief analysis of descriptive statistics that hint towards whether there is evidence in favor of the market sanctuary (MS) hypothesis. Section 3 includes a brief discussion about econometric methodology and construction of the data. I will discuss the econometric results in Section 4 and offer some policy implications and suggestions for further research in the conclusion.

I. Literature Review

Analysis of antidumping has taken a prominent place in the study of international trade policy in recent decades. This reflects its role as one of the most frequently used measures to restrict imports in first the GATT and now WTO systems. Moreover, antidumping use has expanded across a great many new nations in recent decades, an expansion that has been documented and analyzed by many authors, e.g. Miranda et al. (1998), Prusa (2001), Zanardi (2004) and the various authors in Bown (2011). In addition, study of antidumping actions is important since they represent allowed exceptions to some of the most important WTO principles: most-favored-nation (MFN), national treatment, and bound tariffs.[3]

[3] MFN is violated since different countries' exporters face tariffs. National treatment is violated since pricing behavior acceptable by domestic firms (differential pricing across regions) is punished if undertaken by foreigners. Antidumping duties are in addition to

The literature on antidumping has focused on many different aspects of its use both from a theoretical and empirical angle. (See Prusa and Blonigen (2003) for a useful survey.) In recent years, authors have begun to analyze determinants of initiations of antidumping, both in the United States and increasingly among the new users of antidumping in the developing world such as India, Brazil, South Africa and Turkey.[4]

As noted above, very little work has been done on determinants of cases initiated against U.S. exporters, especially compared to the large number of cases focused on determinants of U.S. actions against foreigners. The most notable example of formal empirical analysis of actions taken against U.S. firms is Feinberg and Reynolds (2008). They control for standard measures such as trade volume, exchange rates, and macroeconomic conditions. But they focus most importantly on whether U.S. exporters are more likely to face antidumping actions abroad as a result of U.S. actions against importers. They do indeed find evidence of such retaliation, especially at the national level.

This study builds upon this earlier work on antidumping initiations but focuses on a new issue-----evidence about the market sanctuary hypothesis, which has not been formally studied in the literature.

A very simple partial equilibrium version of the argument is illustrated in Figure 1. Suppose that a U.S. firm has a monopoly position in its home market in good *x* and that domestic demand is linear. In the absence of sales abroad, domestic demand (D) is

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those negotiated in multilateral trade negotiations so that bound tariff commitments are violated.

[4] See for example, Bown (2011), Prusa and Skeath (2004), Bown and Blonigen, Bown and Crowley (2007), Moore and Zanardi (2009), and Feinberg and Reynolds (2006).

insufficient for the monopoly to have positive profits: output is at Q1 with average total cost (ATC1) above the associated domestic price. Now assume that the domestic monopolist gains access to the world market where it can sell for Pw. For simplicity and without loss of generality, the U.S. firm is assumed small in international markets.

At this price, the U.S. firm equates marginal revenue across markets and now produces Q3 for the domestic market and Q2-Q3 for the international market. Note that the expansion of production to Q2 from Q1 results in lower domestic average total costs, now at ATC2. The U.S. firm now earns C at home and loses E on international sales. If area C is larger than E, then the U.S. firm would be able to operate profitably overall even though it incurs negative profits on export sales.

Note as well that the U.S. firm is "dumping" by international standards. On the one hand, it is now selling abroad at a price below its average cost of production (i.e., $Pw < AC2$).[5] In addition, it is practicing international price discrimination by selling at home (P2) above what it charges abroad (Pw). Clearly, this state of affairs would not be able to continue if international arbitrage was at play. Arbitragers would have an incentive to buy internationally acquired goods and sell them into the U.S. market.

This situation is exactly what lies at the heart of those who argue that dumping is caused by firm's operating from a "market sanctuary." In particular, they argue that formal or informal barriers prevent such arbitrage from occurring.

[5] Pricing below *marginal* cost is not the standard in international trade agreements on dumping. Instead, pricing below *production* costs, typically below average total costs in practice, is considered dumping.

It is important to make two further points about the economic analysis embodied in Figure 1. First, this example requires that there is substantial monopoly power in the domestic market so that extra-normal profits can exist. Secondly, this strategy presumes that the firm can lower its costs by expanding production, i.e., it is operating where average costs are decreasing. Without this provision, expanding production through exports when average costs are rising will not yield profits where none existed before.

I will use this simple analysis to examine evidence of the market sanctuary hypothesis for U.S. exporters. I will control for: 1) monopolistic power in the domestic market; 2) high (formal) U.S. barriers to international arbitrage; and 3) high fixed costs, that would be associated with possible declining average costs. It is important to note that without these characteristics, the MS strategy would be very difficult to implement. One important caveat: firms with high fixed costs may continue to produce in the face of a negative demand shock. This will increase the chance that they produce below average total cost but need not reflect operating behind a sanctuary domestic market; it simply might make sense to continue to produce and export.

II. Descriptive Statistics

Table 2 includes a breakdown of antidumping initiations facing U.S. exporters as well as all other countries for the 1978 to 2010 period. As noted above, we see that there were 382 petitions initiated against U.S. firms compared to a world total of 5,763. This means that U.S. exporters faced antidumping actions in 6.6 percent of all cases internationally from 1978 to 2010. To put this in some perspective, U.S. merchandising exports in 2008 equaled 8.3 percent of world trade. (WTO World Trade Report, 2009).

China, on the other hand, was the target of 943 antidumping petitions for the period (or 16.4 percent of the total) although its 2008 world trade share was only 9.1 percent. The high frequency of antidumping actins against China is of course a reflection of its explosive growth in world trade in recent years. The authors in Bown (20111) make clear that countries across the world have focused even more intensely on China over the last decade. Other important antidumping targets include Japan (325), India (170), and Brazil (185 cases).

These figures suggest that the U.S. exporters face antidumping petitions more or less in line with its share of world merchandising trade. The data also make clear that U.S. firms have been frequent targets of antidumping.

Table 3 includes a breakdown of antidumping initiations by major product categories based on the 6-digit North American Industrial Classification System (NAICS), which is a level of aggregation more or less similar to the ISIC 4-digit level. The table includes information when U.S. firms are a target and separate data for non-U.S. exporters.

I use the NAICS system in order to exploit later the detailed information about U.S. international market structure. The NAICS codes were obtained by manually comparing each product name with the U.S. definitions of products on the U.S. Census Bureau website (http://www.census.gov/eos/www/naics). In addition, the Harmonized Tariff System code for each case, compiled by Bown (2012) provided further corroboration for the candidate NAICS code. In cases where the NAICS code was unclear, the petition is characterized as in the "All Others" category.

Antidumping cases targeting U.S. exporters are concentrated in the petrochemical industry, broadly defined. Petitions in the plastics (NAICS 325211), organic chemicals (NAICS 325199), synthetic rubber (NAICS 325212), and inorganic chemicals (NAICS 325188) sectors represented 26.7 percent of all cases (102 out of 382 total) brought against U.S. firms for the 1978-2010 period. This percentage rose to 33.3 percent for the 1993-2010 time frame. The comparable figures for all countries, including the U.S., were 15.6 percent (898 of 5763) and 17.8 (700 of 3929) percent for the two periods, respectively. For all countries, the iron and steel sector (NAICS 33111), which includes basic steel products such as hot-rolled sheet and steel products such as ball bearings, is by far the most commonly targeted sector with 21.3 percent in the earlier period and 20.7 percent in the latter. (Note that this reflects in part the frequent targeting of steel exporters in U.S antidumping cases.)

This variation across sectors for the U.S. and non-U.S. exports suggests the possibility of different driving factors. Some of it certainly reflects the patterns of U.S. exports; the U.S. steel industry has a much less important presence abroad than does the globally competitive U.S. chemicals industry. But the steel and chemicals sectors also share one important characteristic; they are both relatively capital intensive sectors with large fixed costs. As such they may be subject to selling below average total costs in economic downturns with the possibility of accusations of dumping. This feature also is one of the important aspects of the market sanctuary hypothesis.

Table 4 includes various measures for capital intensity and fixed costs for overall manufacturing and for the U.S. manufacturing sectors most frequently cited in foreign antidumping actions.

The measures for the NAICS sectors include the "capital-labor ratio" in Column 1, defined as the reported book value (in thousands of U.S. dollars) divided by the total number of employees of all firms in 1997, and the "capital-shipment ratio" in Column 2, defined as book value divided by the three year shipment value (for years t-2, t-1, and t). The book value and employment of industrial sectors are collected by the U.S. Census every five years from individual firms; NAICS sector domestic shipments are available every year.

We see that the average capital-labor ratios for all US. manufacturing sectors was 104 compared to 611 for the plastics sector, 503 for organic chemicals and 253 for the iron and steel sector. We see similar patterns for the ratio of capital stock to shipments with an average of 0.39 for all industries in the sample compared to 0.84 for organic chemicals, 0.84 for plastics, 0.68 for synthetic rubber, and 0.65 for iron and steel.

In short, we find that U.S. sectors that face the most antidumping actions abroad have higher capital stocks and higher fixed costs of production than average manufacturing, all of which may make them more susceptible to pricing below average total costs with negative demand shocks. These are all consistent with some aspects of the market sanctuary argument but are not sufficient to show that such behavior is taking place. We turn now to two further important aspects of the market sanctuary argument: 1) the presence of non-competitive domestic markets; and 2) high trade barriers that restrict international arbitrage.

I measure the competitiveness of the U.S. market by the standard Herfindahl Hirschman Index (HHI), which is the sum of the market shares of top firms in a particular sector. The U.S. Department of Justice considers an HHI between 1500 and 2500 to be a

moderately concentrated industry, with the potential for anticompetitive behavior increasing as the HHI value increases.[6] Column 3 of Table 4 shows the HHI calculated on the basis of value added for the top 50 firms in the sector. The average for the 1997 Census of Manufacturing for all industries for which the HHI can be calculated[7] equals 763 compared to 333 for plastics, 237 for organic chemicals, 654 for organic and inorganic chemicals. Only synthetic rubber among the frequent U.S. antidumping exporter targets has an HHI that comes close to the overall manufacturing average (725). These figures do not suggest that U.S. industries frequently facing antidumping petitions in export markets are less competitive than average; the HHI for them is far below what the U.S. Department of Justice would deem to be problematic.[8] Columns 4 and 5 display the HHI based on the 2002 and 2007 Census of Manufacturing. The broad picture remains the same though the U.S. steel sector become much more concentrated.

The share of sector value-added by the top four firms is an alternative measure of industry concentration. Column 6 of Table 4 once again suggests that these four manufacturing sectors are not particularly less competitive than the U.S. manufacturing sector as a whole. It is important to note that an HHI calculated for individual products within these categories may be much higher and reflect a potential for market power. More disaggregated data are not available on a systematic basis.

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[6] See http://www.usdoj.gov/atr/public/testimony/hhi.htm. Accessed on 3 September 2012.

[7] A small number of sectors have less than 50 firms in the 6 digit NAICS category; the HHI-50 for these sectors cannot be calculated.

[8] These patterns are qualitatively identical if the HH index is calculated on the basis of firm shipments. In fact, there is even less evidence of important market concentration based on that measure.

We also see little evidence that these U.S. sectors are protected by tariffs higher than normal in the relatively open U.S. economy. Column 7 of Table 4 includes the average sectoral applied most-favored-nation tariff rates[9] for these sectors as well as the overall manufacturing sector for the period 1993-2004 (which is based on Nicita and Olarreaga (2007) for ISIC categories). One sees that the unweighted manufacturing sector average tariff of 4.73 percent is higher than any of the five sectoral averages for U.S. industries especially targeted by foreign governments in antidumping actions. It is important to note that these averages do not reflect any non-tariff barriers such as quotas, import licenses, or invisible import restrictions.[10]

There is little evidence from tariffs alone that firms in these sectors are able to operate within a protected U.S. market that allows them to "subsidize" low sales abroad from excess profits at home.

The evidence presented in this section is generally not supportive of the market sanctuary hypothesis for four U.S. industries most frequently accused of dumping in foreign markets. We do see convincing and consistent evidence that the U.S. plastics, chemicals, and synthetic rubber industries are capital intensive and have high fixed costs relative to national manufacturing averages. These results are consistent with one important aspect of the market sanctuary hypothesis, to wit, firms with high capital and fixed costs might have an incentive to expand production in a downturn by turning to an

[9] These figures do not reflect preferential trade agreement rates or unilateral preferences, so that these averages are an upper bound of the protection these sectors receive.
[10] There may be product level variation within these sectors that reflect more protection than evident from the broad sectoral averages. Bown (2012) reports the HS codes for all antidumping cases brought against U.S. The simple unweighted average applied tariff for these categories was 4.3 percent as of March 2013, which is similar to the overall tariff average reported in Table 4. Source: U.S. ITC (http://www.usitc.gov/tariff_affairs/tariff_databases.htm). Accessed March 2013.

international market to keep their average total productions costs down. But we do not see support for two other critical pieces to that market sanctuary argument. In particular, these four sectors seem to be *more* competitive than national averages, at least as measured by the Herfindahl-Hirschman index. In addition, these four sectors are not characterized by tariffs higher than average for the U.S. manufacturing sector.

III. Econometric Strategy and Data

I now turn to a more formal analysis of the market sanctuary hypothesis by analyzing what variables help explain the probability of observing an initiation of an antidumping petition in a 6 digit NAICS category for U.S. exports. The empirical focus is of a purely reduced form nature that documents basic correlation of the data with expected outcomes.

This relationship is naturally examined using a Probit model since the researcher cannot observe the underlying utility of a foreign industry contemplating filing a petition against a U.S. exporter. Instead, the researcher only sees whether a petition has been filed or not. Thus, the probability of a filing is characterized by the following:

$$\mathrm{P}\left(y_{ikt}=1\right) = \Phi\left(\alpha + MS_{t-1}\beta_1 + X_{ikt-1}\beta_2 + R_{t-1}\beta_3\right) \tag{1}$$

where y_{ikt} takes on a value of 1 if an antidumping petition is filed by importing country i against the U.S. in sector k in year t and $\Phi(\cdot)$ is the cumulative normal distribution.

MS_{t-1} includes various regressors associated with the market sanctuary hypothesis. Information about conditions inside country i is included in X_{ikt-1}. This will include both

information at the sector or country level. Matrix R_{t-1} will include various measures of retaliation and deflection involving other countries' use of antidumping, both of which have been found in the literature to have important explanatory power for initiations. Standard errors are clustered on an industry basis reflecting heteroskedasticity in the disturbance terms.[11]

Note that most regressors generally are lagged one period from the year in which the probability of an initiation is assessed since antidumping authorities look at past circumstances to decide on the merit of a filing (and petitioners take this aspect into account when deciding whether to file or not a case). In addition, lagging the explanatory variables will reduce endogeneity problems. There are some time-invariant variables for which this cannot be done.

The data analysis will not include the universe of all countries using antidumping nor all product categories involving U.S. exports. Instead, I restrict the sample to manufacturing sectors alone because the U.S. Census does not collect detailed data for agricultural sectors. In any event, a large fraction of the cases involving U.S. firms are in the manufacturing sector.

The analyzed countries are either traditional users of antidumping (the European Union, Canada, and Australia) or countries that have become important new users of

[11] There may be important unobservable country and year variation not captured by the regressors. I therefore will also include fixed effects for the year and the importing country to control for unobservables in specifications not reported here. However, Probit models with fixed effects can cause problems associated with the "incidental variables problem." Consequently, I also estimate an alternative specification using a linear probability model that includes country and year fixed effects as a robustness check. The results are qualitatively similar to those reported below and are available on request.

antidumping (Argentina, Brazil, Colombia, China, India, Mexico, Korea, and South Africa). I only include these eleven importing jurisdictions in the analysis for two reasons. First, I choose not to include countries that have never filed an antidumping petition against the U.S. Secondly, the countries included represent the vast majority of all antidumping petitions involving in the U.S. involve these countries.

Information about the petitions filed against the U.S. comes from two sources: Moore and Zanardi (2009) and Bown (2012), both of which are based on government publications rather than submissions to the WTO, which are often incomplete and inaccurate.

As noted above, the basic unit of observation for the study is a 6-digit NAICS category, roughly the same level of aggregation as a 4-digit ISIC sector, and includes 473 manufacturing sectors. This level of aggregation is more detailed than often used in the literature (e.g., Moore and Zanardi (2009 and 2011) and Feinberg and Reynolds (2007)) but less detailed than the 6, 8, or even 10 digit Harmonized System Code categorization used by the administering authority when implementing antidumping petitions. The 6-digit NAICS level does allow me to utilize the U.S. Census detailed industrial data.

Control variable names, sources, and basic descriptive statistics for the entire data set are included in Table 5.

In the regressions below, I report results for three variables for U.S. 6-digit NAICS categories associated with the MS hypothesis: 1) capital-shipment ratio; 2) sectoral average applied tariff; and 3) the fifty firm HHI for value-added. The expected value for the coefficients of each one is positive under the hypothesis that U.S. firms targeted by antidumping operate within a domestic sanctuary market.

The "U.S. Capital/Shipment" ratio is defined as the book value (in thousands of U.S. dollars) divided by the previous three-year average domestic shipments. The book value is based on 1997 firm level data while shipments are available for every year. The annual variation of this variable therefore comes from the changes in domestic shipments rather than the capital stock. This variable is designed to control for the fixed costs of U.S. manufacturing industries and the consequent possibility of using exports as a way to expand production and lower average costs. The Herfindahl-Hirschman Index is calculated on the basis of the value-added of 50 top firms in each sector for year 1997 and is a standard measure of industry competitiveness. The tariff rate is the MFN applied rate for the NAICS 6-digit category for year *t-1* and consequently varies for each year.[12]

A final control variable ("U.S. Demand (change)") is included in some specifications. This variable is the percentage change from *t-2* to *t-1* of net U.S. domestic shipments at the NAICS 6-digit level, defined as the total value of shipments minus the value of exports. This variable will help control for the possibility that U.S. firms react to a drop in domestic demand by increasing exports and therefore find themselves more likely to face antidumping abroad. This interpretation would suggest a negative coefficient. The value of shipments is obtained from the U.S. Census and the value of exports from the U.S. International Trade Commission.

The matrix X_{ikt-1} includes information about the importing country that has been found in the literature to be important in explaining antidumping petitions. I include the tariff level in time t-1 ("Foreign Tariff (level)"). The expected sign is ambiguous. On the

[12] Note that the World Bank's Trade and Production Database does not include U.S. tariffs data for 1994. Consequently, I use a simple average for 1993 and 1995 for the missing data.

one hand, a negative sign might indicate that firms already facing intense international competition might be more prone to turn to antidumping duties. On the other hand, firms that might have political clout and already receive high applied tariffs may feel that they will be likely to win an antidumping case. All tariff information was obtained from the World Bank's Trade and Production Database, the latest data for which ends in 2004. The data is reported in the original World Bank data at the ISIC 3-digit level and is converted to the NAICS system by careful matching of categories.

The WTO antidumping agreements require that administering authorities find that imports are causing "material injury" to a domestic industry before duties can be applied. Consequently, I include the percentage change in U.S. exports ("U.S. Export (change)") to the importing country in sector *j* from t-2 to t-1 as an explanatory variable. I also include the level of U.S. exports at the sectoral level ("U.S. Exports (level)"), which will control for those sectors in which there is a large U.S. export presence. These data come from the U.S. International Trade Commission online database ("http://dataweb.usitc.gov"), which includes NAICS 6-digit level U.S. exports from 1997-2007. Data prior to 1997 were collected using the SIC classification, which was converted to NAICS categories.

The expected sign on the coefficient for "U.S. Export Growth" is positive; the greater the change in U.S. exports, the more likely that an industry will file an antidumping petition against them. The working hypothesis is that larger increases of exports will be positively correlated with a positive decision by administering agencies so that firms would be more likely to fall knowing that they might win a case. I also expect a positive coefficient for "U.S. Exports (level)".

I also control for three country level variables for the importing economy. These include: 1) the change in (nominal) bilateral exchange rate at from *t-2* to *t-1* with the U.S. ("Exchange Rate (change)"), obtained from the U.S. Federal Reserve Board and the IMF and defined as foreign currency units per dollar[13]; 2) the GDP growth ("GDP Growth") rate in the importing country, obtained from the World Bank's *World Development Indicators* for year *t-1*, and 3) the importing country current account to GDP ratio in year *t-1*, also obtained from the World Bank's *World Development Indicators* ("Current Account").

The expected coefficient for the exchange rate is negative. A high value of the domestic currency vis-à-vis the dollar will make U.S. exports cheap and thereby increase the competitive pressure on domestic import-competing industry.

The coefficient for "GDP Growth" is expected to be negative. The higher the level of overall domestic economic activity, the less likely that domestic firms may be in economic distress, and the less likely that they would decide to file an antidumping petition. However, it is important to note that macroeconomic conditions may tell only a part of the story since sectoral pressures may vary from the overall domestic economy. Therefore, sectoral variation in the importing country would be preferable in principle but the requisite data is not available on a systematic basis for the countries in the sample.

I also include variables to control for retaliation and deflection involving antidumping cases, both of which have been found to be important in the existing literature. Retaliation in this instance refers to the motivation to initiate antidumping petitions against the U.S. industries as a response to the U.S. filing its own antidumping

[13] The euro-dollar exchange rate was used for all European Union members and the ecu-dollar rate for pre-1999.

petitions. Deflection refers to the possibility, first noted by Bown and Crowley (2007), that antidumping petitions filed abroad can divert trade to country *i* and thereby trigger AD cases by country *i*. Note that Feinberg and Olson (2008) found that retaliation is a statistically significant predictor of antidumping actions taken against U.S. exporters.

"Retaliation (sector)" is the number of cases filed against the importing country *i* in year *t-1* in sector *j* in the U.S. The second is "Retaliation (country)," which is the number of U.S. cases filed against the importing country *i* in year *t-1* in all sectors. The former reflects the possibility that an industry, say the steel sector in Mexico, might decide to file a case against U.S. firms if American companies had filed cases against Mexican steel exports. The latter expands this to a response to U.S. cases against all Mexican export sectors. I expect a positive coefficient for both variables; Mexican firms may want to retaliate and might also feel they have a higher chance to win a case against the U.S. if Mexican exports have been affected by U.S. AD actions.

I also include "Deflection," which is the number of cases filed in year *t-1* in sector *j* in all countries (i.e. including those not in the twelve country sample for this study) except for country *i*. The expected sign for the coefficient for this variable is also positive; the more cases are filed worldwide in the particular sector, the more likely that trade will flow in country *i,* thereby increasing the chance that one observes a new petition in that sector.

Three different data sets will be used below, all of which span 1994 through 2007: 1) all twelve countries in the data set; 2) traditional users; and 3) "new users" that have become more intensive users of antidumping actions in recent years.

IV. Econometric Results

Table 6 includes the results from the Probit estimations without country or year fixed effects for all countries in the data set. Note that the reported coefficients are the marginal increased probabilities of observing an antidumping initiation when the value of the regressor increases infinitesimally. These marginal probabilities are very small given the small number of antidumping cases relative to the total number of industries in the sample.

The first two column is the base case and includes a fairly standard set of explanatory variables in the literature on antidumping initiations and consequently does not include any of the variables associated with the market sanctuary hypothesis. The second column excludes the foreign tariff level, which increases the number of observations from 36,001 to 54,980. The third column replaces the sectoral retaliation variable with the aggregate retaliation variable.

The results are as expected for a number of the controls. Similar to other studies, trade deflection as a result of antidumping cases is positive and statistically significant at the 10 percent level; U.S. firms are more likely to face antidumping actions the more cases have been filed in this sector in the previous year for the world as a whole, excluding the importing country. This suggests that trade is being "deflected" into countries that then take actions against other exporters, including the U.S. We also see that a high *level* of U.S. exports to a particular sector raises the probability of observing an antidumping petition in a statistically significant way.

A weak dollar is associated with a higher probability of an antidumping petition against U.S. exporters though this effect is measured imprecisely. We also see no

evidence that petitions against U.S. firms are more likely in retaliation against U.S. antidumping actions against firms in the importing country. This is true both for possible retaliation within the same sector "Retaliation (country)" in column (1) or a broader reaction against U.S. antidumping actions in all sectors "Retaliation (sector)" in column (2). These results are surprising given the outcomes of many studies such as Bown and Crowley (2007).

We do find that the coefficients for two variables have unexpected signs and are statistically significant. In particular, higher aggregate GDP growth in the importing country consistently is associated with a higher probability of a case filed against a U.S. exporter. Falling U.S. exports in the sector also are correlated with a *higher* likelihood of a petition. Neither outcome, especially the result for U.S. exports, reflects the antidumping process working as intended. These results are likely biased given that there are almost 3000 instances where the percentage change in U.S. exports were exceptionally large since there were very small export values in the base year. In subsequent tables, I report results when observations were dropped with year to year U.S. export changes were greater than 300 percent.

I now turn to the main question of the study, which is whether there is evidence that U.S. firms operate behind a closed, uncompetitive domestic market, and then can use expanding exports to reduce average production costs.

Note that the results for the variables in the base case specification generally remain qualitatively identical to columns (1) through (3) of Table 6. The notable exception is that the exchange rate variable is now significantly different from zero in some specifications.

In column (4) of Table 6, I add an interaction term between the sectoral Herfindahl index and the U.S. tariff rate. If U.S. firms were operating in a protected domestic market, with low levels of competition and relatively high import barriers, one would expect this variable to be positive and significantly different from zero. We see that there are no such indications in the estimated coefficients.

In subsequent columns, I report results after adding MS variables *in seriatim*.

The results in column (5) of Table 6 indicate that U.S. manufacturing sectors with high costs as measured by the ratio of book value to shipments are more likely to face antidumping actions abroad.[14] These results suggest that the first aspect of the market sanctuary hypothesis may be plausible for U.S. exporters, i.e., those that have high fixed costs might use exports as a way to lower average production costs. This clearly is not sufficient evidence that U.S. companies are acting this way but it does suggest that importing nations may be targeting U.S. firms that might be in the position to use such a strategy.

Columns (6) and (7) of Table 6 includes two further variables that help us examine the MS hypothesis. We see that the including the U.S. tariff and the 1997 Herfindahl-Hirschmann index provide no statistically significant explanatory power for explaining cases against American companies.[15]

These results cast important doubt on the market sanctuary hypothesis for U.S. firms. More precisely, there is little evidence that foreign firms are targeting U.S.

[14] In results not reported here, I use the ratio of book value to total employees as an alternative measure. The results in these Probit estimations are qualitatively identical to those reported for the capital-labor ratio.

[15] I also included the HHI based on the share of shipment value (rather than value-added) and share of value-added of the top four firms in the sector. The empirical results are very similar to those reported here.

companies that benefit from high tariffs in the U.S. or that are relatively uncompetitive in the U.S. domestic as indicated by standard measure of market concentration.

I finally include the measure of recent U.S. changes in net domestic shipments as an explanatory variable in column (8). As noted above, this is to evaluate the frequent claim that antidumping is a necessary part of the international system to counter the incentives of firms to deal with dropping demand by ramping up exports. In fact, we see no evidence that dropping U.S. domestic shipments helps explain the pattern of cases brought against American firms.

In Table 7, I report the same regressions when the outlier cases of U.S. export growth exceeding 300 percent were excluded. We see that the general patterns for the market sanctuary variables remain: only the coefficient on the capital-shipments variable is significantly different from zero. One notable change is that the coefficient on exchange rate changes is now negative (as expected) and significant in all of the specifications. The unanticipated result that U.S export changes enter positively (rather than negatively) is not robust: in no instance is this coefficient significantly different from zero. In subsequent regressions, the export outliers are dropped.

Tables 1 and 2 above showed that the countries filing cases against the U.S. has changed substantially over time. Consequently, I report the same econometric specifications found in Table 6 for traditional antidumping users (Table 8) and for new users (Table 9).

Most importantly, we find no differences across the two subsets of data concerning the market sanctuary variables. For both cases, the measure of capital costs has very similar effects: the capital-shipments variable retains its sign and statistical

significance as well as the relative size of the estimated coefficients. The U.S. tariff and measures of sectoral competition continue to provide little predictive power.

Other results are similar are the two groups of countries: higher levels of U.S. exports are positively correlated with antidumping petitions for both. Trade deflection as a result of antidumping use affecting other countries seems to be important for new and traditional users deciding to target U.S. exporters.

There are some other important differences across the two samples for other regressors. In general, some of the unexpected results for the entire data set in Table 6 seem to be a consequence of actions among new users rather than traditional antidumping countries. For example, we see in Table 9 for traditional users that the positive and significant coefficient for aggregate domestic growth does not continue. This regressor does help explain new antidumping petitions among new users. The results also indicate that sectoral retaliation may be an important predictor of antidumping use among developed country users of antidumping but not for developing countries.

V. Conclusion

This research is the first effort to evaluate the argument offered by supporters of antidumping that this WTO sanctioned import restriction is necessary to counter firms using a sanctuary market at home to "dump" in foreign markets. I do so by analyzing petitions filed against U.S. firms operating in twelve important trading partners for the 1994-2010 period. Formal econometric analysis is for the 1994-2007 so that the recent financial crisis period is excluded. The research does so by exploiting detailed industry level data at the six digit North American Industrial Classification System.

The Probit analysis finds no evidence that foreign antidumping petitions are targeting U.S. firms that correspond to circumstances of the market sanctuary hypothesis. Most notably, the results suggest that neither import barriers nor standard measures of anti-competitive markets help predict antidumping cases brought against American exporters. While it is conceivable that foreign firms are missing opportunities to file against U.S. companies that truly exploit a favorable market situation at home, it is more likely that antidumping cases are being filed for other reasons.

I also find that exporters with high fixed costs are more likely to face these petitions. This is consistent with a world in which a company might temporarily price below average total costs and become ensnared in the antidumping net. The U.S. chemicals and plastics industries seem to be especially prone to face trade remedy actions.

The evidence also suggests that the more U.S. firms exports to a country, the more likely they will face a case. There is no systematic evidence that recent surges in American exports play a role in encouraging initiations for developed countries. In addition, if there is a spate of antidumping actions abroad in a particular sector in an earlier year, it is more likely that American companies will face a petition in the subsequent year, at least for traditional antidumping users.

In short, this research suggests that there is little indication that market sanctuary considerations play a significant role in predicting when foreign countries will file antidumping actions against U.S. companies. This evidence cannot help us directly understand whether firms in *other* countries operate behind closed uncompetitive markets that then "unfairly" compete with U.S companies. Those firms indeed may exploit

formal and informal barriers to "subsidize" their exports. But the results of this research certainly suggest that firms that do not have the advantage of a home "market sanctuary" can be swept up into the antidumping net. This alone means that world antidumping rules might be rewritten to avoid "catching" firms that simply have high fixed costs but otherwise are operating within a competitive framework.

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Figure 1: Sanctuary Market

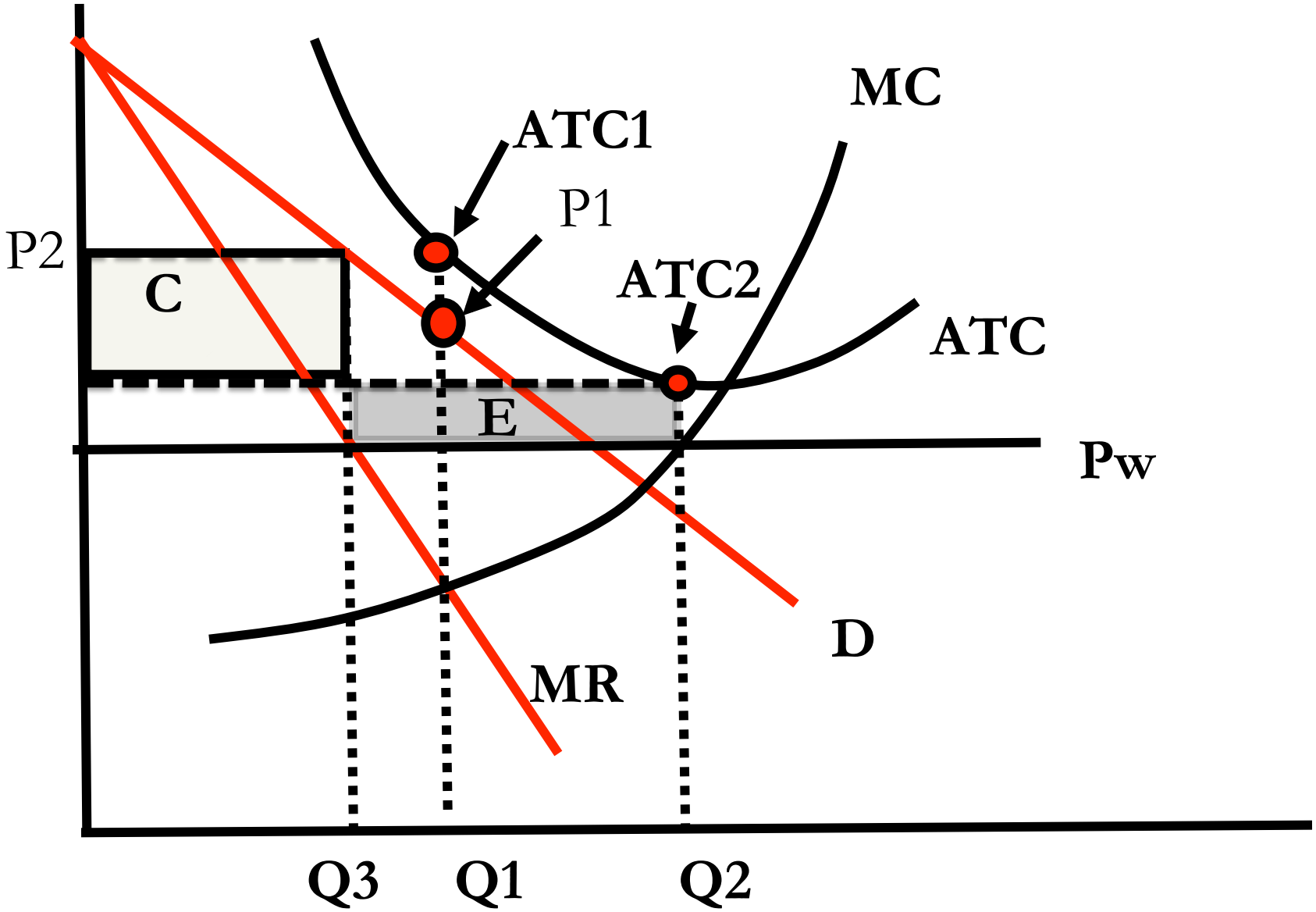

Table 1 Initiations against US firms

Traditional Users	Total (1978-2010)	1978-1992	1993-2003	2004-2010
Canada	67	42	20	5
Australia	29	14	11	4
EU	20	4	9	7
Subtotal	116	60	40	16
New Users				
Mexico	79	42	35	2
Brazil	42	4	24	14
India	34	1	20	13
China	32	0	13	19
South Korea	19	3	11	5
South Africa	16	4	9	3
Argentina	5	0	4	1
Others	39	7	24	8
Subtotal	266	61	140	65
Total	382	121	180	81

Source: Bown (2012)

Table 2: Antidumping Initiations

(1978-2010)

	Initiating Country ("importing")	As Target Country	Share of Total AD Initiations as Target Country	Country Share of 2008 World Merchandise Trade
U.S.	1230	382	6.6%	8.2%
China	189	943	16.4%	9.1%
EU	724	87	1.5%	37.5%
India	628	183	3.2%	1.1%
Brazil	276	185	3.2%	1.3%
Canada	366	92	1.6%	2.9%
Japan	10	325	5.6%	5.0%
Others	2340	3566	61.9%	35.0%
Total	5763	5763	100%	

Source: Bown (2012) and WTO (2009)

Note: EU trade includes intraEU transactions.

Table 3: Antidumping Initiations Categorized by NAICS* Code (1978-2010)

NAICS sector (NAICS code)	All Countries	US as Target	All (1993-2010)	US as Target (1993-2010)
Plastics (325211)	359	37	263	31
Organic Chemicals (325199)	298	37	252	35
Synthetic Rubber (325212)	52	15	48	13
Inorganic Chmicals (325188)	189	13	137	8
Iron and Steel (331111)	1226	31	815	15
Broadwoven Fabric Mills (313210)	107	1	93	0
Yarn Spinning Mills (313111)	71	0	57	0
All Others	3461	248	2264	159
	5763	382	3929	261

* North American Industrial Classification System

Source: Bown (2012) and author calcualtion

Table 4: Sectoral Characteristics of Antidumping Petitions Against Select U.S. NAICS Sectors

Sector (NAICS code)	Capital/Labor* (1997)	Capital/Shipment** (1997)	Herfindahl-Hirschman Index*** (1997)	Herfindahl-Hirschman Index (2002)	Herfindahl-Hirschman Index (2007)	Share of Value Added of Top Four Firms	U.S. Applied Taruffs
Overall Manufacturing	104	0.39	763	761	743	42	4.73
Plastics (325211)	611	0.84	333	443	546	29	3.54
Organic Chemicals (325199)	503	0.84	237	238	289	23	2.6
Synthetic Rubber (325212)	342	0.68	725	744	717	46	3.54
Inorganic Chemicals (325188)	243	0.75	654	217	303	39	1.88
Iron and Steel (331111)	254	0.65	560	657	907	39	2.13

* Book value (in thousands of U.S. dollars) divided by the total number of employees of all firms in 1997;
** Book value divided by the three-year shipment value (for years t-2, t-1, and t);
*** All versions of Herfindahl-Hirschmann index based on value-added of 50 top firms in sector.

Source: U.S. Bureau of Census and Nicitia and Olarreaga (2007)

Table 5 Descriptive Statistics*

Variable Name	Description	Source	Mean (Standard deviation)	Expected Sign
Importing Country Sectoral Conditions				
U.S. Export Growth	Percentage change in U.S. exports in NAICS category from year t-2 to t-1 in importing country i	U.S. International Trade Commission	12.46 (61.08)*	Positive
US Exports (level)	U.S. exports in NAICS category j in year t in importing country I (US$ millions)	U.S. International Trade Commission	105 (7.5)	Postive
Import Country Macro Economic Conditions				
GDP Growth	Nominal GDP growth in country i for year t-1	World Development Indicators	4.03 (3.48)	Negative
CA/GDP	Current account as share of GDP in country i for year t-1	World Development Indicators	-0.68 (3.16)	Negative
Exchange Rate (change)	Change in exchange rate (local currency per current US dollar) from year t-1 to year t in importing country i	World Development Indicators	17.92 (150.79)	Negative
Foreign Tariff (level)	Lowest tariff in importing country in year t in NAICS category j	Nicita and Olarrega (2007)	9.13 (9.59)	?
Retaliation and Deflection (Effects of Antidumping Use in Other Sectors)				
Retaliation (sector)	Number of AD cases filed in the US against importing country i in year t-1 in same sector	Bown (2012) and Moore/Zanardi (2009)	0.004 (0.12)	Positive
Retaliation (country)	Number of AD cases filed in the US against importing country i in year t-1 in all sectors	Bown (2012) and Moore/Zanardi (2009)	1.73 (2.82)	Positive
Deflection	Number of AD cases initiated in year t-1 in NAICS sector j in all countries except for importing country i	Bown (2012) and Moore/Zanardi (2009)	0.58 (4.18)	Postive
Market Sanctuary Variables				
U.S. Tariff	US average tariff in NAICS sector j for year t	Nicita and Olarrega	4.42 (18.93)	Positive
H-H Index (1997)	Herfhindahl index (value added) for NAICS sector j in larget 50 U.S. companies in 1997	U.S. Bureau of Census	775.02 (704.64)	Positive
U.S. Capital/Shipments	Book value (1997) of NAICS sector divided by the three-year shipment value (for years t-2, t-1, and t)	U.S. Bureau of Census	0.03 (.02)	Postive
U.S. Domestic Demand (change)	Changes in US domestic shipments for NAICS sector for years t-2 to t-1.	U.S. Bureau of Census	0.02 (1.13)	Negative

* These data exclude instances where the U.S. exports increased more than 300 percent in one year. See text for more discussion.

Table 6: All Countries (Probit Marginal Probability Estimates)

Variable Name (Expected Sign)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP Growth	0.021*	0.015*	0.015*	0.018*	0.018**	0.018**	0.017**	0.017**
(-)	(0.012)	(0.0084)	(0.0083)	(0.010)	0.0079	0.0079	0.0081	0.0081
CA/GDP	-0.0063	-0.0092*	-0.0099*	-0.011	-0.0092	-0.01	-8.4 x 10-03	-8.4 x 10-03
(-)	(0.0072)	(0.0052)	(0.0055)	(0.0072	(0.0061)	(6.1 x 10-03)	(6.4 x 10-03)	(6.4 x 10-03)
Exchange Rate (change)	-6.5 x 10-04	-9.3 x 10-04	-9.3 x 10-04	-9.7 x 10-04	-0.0014**	-0.0014**	-0.0012**	-0.0012**
(-)	(5.3 x 10-04)	(6.8 x 10-04)	(6.7 x 10-04)	(7.5 x 10-04)	(6.1 x 10-04)	(6.1 x 10-04)	(6.2 x 10-04)	(6.2 x 10-04)
Retaliation (country)	0.023	-0.005		-0.004	0.03	0.030	0.031	0.031
(+)	(0.035)	(0.057)		(0.058)	(0.043)	(0.043)	(0.044)	(0.044)
Deflection	0.014**	0.014**	0.014**	0.014**	0.0085**	0.0085**	0.0086**	0.0086**
(+)	(0.0059)	(0.0062)	(0.0055)	(0.0063)	(0.0041)	(0.0041)	(0.0041)	(0.0041)
Foreign Tariff (level)	-9.3 x 10-04							
(?)	(2.1 x 10-03)							
US Exports (change)	-2.2 x 10-04**	-2.3 x 10-04**	-2.2 x 10-04**	-2.8 x 10-04**	-2.6 x 10-04**	-2.6 x 10-04**	-2.5 x 10-04**	-2.5 x 10-04**
(+)	(1.0 x 10-04)	(1.0 x 10-04)	(1.0 x 10-04)	(1.2 x 10-04)	(1.0 x 10-04)	(1.0 x 10-04)	(1.1 x 10-04)	(1.1 x 10-04)
US Exports (level)	8.7 x 10-5**	8.4 x 10-5***	8.4 x 10-5***	8.8 x 10-5**	5.0 x 10-5**	5.0 x 10-5**	5.0 x 10-5**	5.0 x 10-5**
(+)	(3.4 x 10-5)	(3.1 x 10-5)	(3.1 x 10-5)	(3.5 x 10-5)	(2.0 x 10-5)	(2.0 x 10-5)	(2.0 x 10-5)	(2.0 x 10-5)
Retaliation (sector)			0.0023					
(+)			(0.0040)					
HHI*US tariff				-3.1 x 10-07				
(+)				(5.5 x 10-07)				
Capital/Shipments					4.50***	4.52***	4.83***	4.83***
(+)					(1.43)	(1.44)	(1.65)	(1.65)
US Tariff						-4.2 x 10-4	3.5 x 10-06	3.6 x 10-06
(+)						(6.4 x 10-04)	(8.5 x 10-04)	(8.5 x 10-04)
Herfindahl Index							-9.2 x 10-06	-9.2 x 10-06
(+)							(5.7 x 10-05)	(5.7 x 10-05)
Change in Domestic Shipments								-0.0028
(-)								(0.0044)
Observations	36,001	54,980	54,980	44,055	39,860	39,690	37,990	37,990
Log pseudolikelihood	-663.4	-948.4	-948.3	-808.3	-722.4	-721.4	-682.4	-682.4
Pseudo R-squared	0.0832	0.0735	0.0735	0.0828	0.0960	0.0967	0.100	0.100

Clustered standard errors in parentheses

Probit Estimates with Foreign AD Initiation as Dependent Variable (Marginal Probabilities)

Table 7: All Countries (Attenuated Sample)-- Probit Estimates with Foreign AD Initiation as Dependent Variable (Marginal Probabilities)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP Growth	0.026*	0.02*	0.019*	0.022*	0.024**	0.024**	0.023**	0.023**
(-)	(0.014)	(0.011)	(0.011)	(0.013)	(0.011)	(0.011)	(0.011)	(0.011)
CA/GDP	-7.4 x 10-03	-0.0138**	-0.0142**	-0.0138	-0.0120	-0.0121	-0.0105	-0.0105
(-)	(8.3 x 10-03)	(6.9 x 10-03)	(7.2 x10-03)	(8.6 x 10-03)	(8.4 x 10-03)	(8.4 x 10-03)	(8.5 x 10-03)	(8.5 x 10-03)
Exchange Rate (change)	-3.3 x 10-04***	-3.3 x 10-04**	-3.4 x 10-04**	-3.5 x 10-04**	-4.1 x 10-04*	-4.1 x 10-04*	-3.6 x 10-04**	-3.6 x 10-04**
(-)	(1.0 x 10-04)	(1.4 x 10-04)	(1.4 x 10-04)	(1.4 x 10-04)	(2.4 x 10-04)	(2.4 x 10-04)	(1.8 x 10-04)	(1.8 x 10-04)
Retaliation (sector)	0.023	-9.8 x 10-03		-9.5 x 10-03	0.04	0.040	0.039	0.039
(+)	(0.041)	(0.071)		(0.074)	(0.059)	(0.059)	(0.058)	(0.058)
Deflection	0.017**	0.017**	0.017**	0.017**	0.012**	0.012**	0.012**	0.012**
(+)	(6.7 x 10-03)	(7.6 x 10-03)	(6.7 x 10-03)	(7.9 x 10-03)	(5.6 x 10-03)	(5.6 x 10-03)	(5.4 x 10-03)	(5.4 x 10-03)
Foreign Tariff (level)	-1.7 x 10-03							
(?)	(2.5 x 10-03)							
US Exports (change)	4.8 x 10-04	4.5 x 10-04	4.6 x 10-04	3.5 x 10-04	2.1 x 10-04	2.0 x 10-04	2.5 x 10-04	2.5 x 10-04
(+)	(3.1 x 10-04)	(2.8 x 10-04)	(2.8 x 10-04)	(2.9 x 10-04)	(2.7 x 10-04)	(2.7 x 10-04)	(2.9 x 10-04)	(2.8 x 10-04)
US Exports (level)	9.7 x 10-5 **	9.9 x 10-5 ***	9.9 x 10-5 ***	1.1 x 10-5**	6.7 x 10-5**	6.7 x 10-5**	6.4 x 10-5**	6.4 x 10-5**
(+)	(4.0 x 10-5)	(3.7 x 10-5)	(3.7 x 10-5)	(4.2 x 10-5)	(2.7 x 10-5)	(2.7 x 10-5)	(2.7 x 10-5)	(2.7 x 10-5)
Retaliation (aggregate)			1.0 x 10-3					
(+)			(4.9 x 10-03)					
HHI*US tariff				-3.3 x 10-07				
(+)				(6.7 x 10-07)				
Capital/Shipments					6.15***	6.19***	6.40***	6.40***
(+)					(1.83)	(1.85)	(2.13)	(2.13)
US Tariff						-6.3 x 10-04	-8.5 x 10-05	-8.4 x 10-05
(+)						(9.2 x 10-04)	(1.2 x 10-03)	(1.1 x 10-03)
Herfindahl Index							-8.6 x 10-06	-8.6 x 10-06
(+)							(7.5 x 10-05)	(7.5 x 10-05)
Change in Domestic Shipments								-4.4 x 10-03
(-)								(5.8 x 10-03)
Observations	33,216	48,751	48,751	39,073	35,338	35,184	33,695	33,695
Log pseudolikelihood	-655.7	-921.6	-921.6	-785.3	-702.7	-701.7	-662.9	-662.9
Pseudo R-squared	0.0830	0.0730	0.0730	0.0809	0.0915	0.0922	0.0966	0.0966

Clustered standard errors in parentheses

The sample excludes instances where U.S. annual export change exceeds 300 percent

Table 8: Traditional Users (Attenuated Sample)-- Probit Estimates with Foreign AD Initiation as Dependent Variable (Marginal Probabilities)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP Growth	7.6 x 10-03	0.011	-4.8 x 10-03	-0.013	5.4 x 10-03	5.3 x 10-03	-0.016	-0.016
(-)	(0.038)	(0.034)	(0.034)	(0.034)	(0.039)	(0.039)	(0.039)	(0.039)
CA/GDP	-5.8 x 10-03	2.5 x 10-04	4.9 x 10-03	-0.012	'-0.012	'-0.012	-0.017	-0.017
(-)	(0.015)	(0.013)	(0.013)	(0.017)	(0.018)	(0.018)	(0.02)	(0.02)
Exchange Rate (change)	5.3 x 10-03	5.2 x 10-03	4.7 x 10-03	4.8x 10-03	8.1 x 10-04	8.0 x 10-04	8.4 x 10-04	8.5 x 10-04
(-)	(3.9 x 10-03)	(3.7 x 10-03)	(3.5 x 10-03)	(3.4 x 10-03)	(4.6 x 10-03)	(4.7 x 10-03)	(3.8 x 10-03)	(3.8 x 10-03)
Retaliation (sector)	0.046**	0.042**		0.041**	0.11***	0.11***	0.091***	0.091***
(+)	(0.019)	(0.019)		(0.019)	(0.034)	(0.034)	(0.032)	(0.032)
Deflection	0.012***	0.011**	0.012**	0.011**	6.4 x 10-03**	6.4 x 10-03**	6.1 x 10-03**	6.1 x 10-03**
(+)	(2.8 x 10-03)	(2.8 x 10-03)	(2.7 x 10-03)	(2.9 x 10-03)	(3.1 x 10-03)	(3.1 x 10-03)	(2.8 x 10-03)	(2.8 x 10-03)
Foreign Tariff (level)	-1.7 x 10-04							
(?)	(0.011)							
US Exports (change)	-1.9 x 10-04	-3.6 x 10-05	-7.3 x 10-05	-1.7 x 10-04	-6.7 x 10-04	-6.8 x 10-04	-6.3 x 10-04	-6.3 x 10-04
(+)	(5.4 x 10-04)	(4.9 x 10-04)	(4.7 x 10-04)	(5.3 x 10-04)	(5.7 x 10-04)	(5.7 x 10-04)	(5.5 x 10-04)	(5.5 x 10-04)
US Exports (level)	6.3 x 10-5***	6.2 x 10-5***	5.8 x 10-5 ***	6.1 x 10-5***	5.0 x 10-5**	5.0 x 10-5**	4.6 x 10-5**	4.6 x 10-5**
(+)	(2.4 x 10-5)	(2.0 x 10-5)	(2.0 x 10-5)	(2.3 x 10-5)	(2.3 x 10-5)	(2.3 x 10-5)	(2.2 x 10-5)	(2.2 x 10-5)
Retaliation (aggregate)			-0.018					
(+)			(0.014)					
HHI*US tariff				3.4 x 10-8				
(+)				(3.9 x 10-07)				
Capital/Shipments					3.69**	3.76**	3.83***	3.84**
(+)					(1.73)	(1.74)	(1.75)	(1.75)
US Tariff						-1.1 x 10-04	1.8 x 10-04	1.9 x 10-04
(+)						(7.7 x 10-04)	(9.2 x 10-04)	(9.2 x 10-04)
Herfindahl Index							4.9 x 10-05	4.9 x 10-05
(+)							(7.5 x 10-05)	(7.5 x 10-05)
Change in Domestic Shipments								-7.4 x 10-03
(-)								(6.8 x 10-03)
Observations	11,578	14,209	14,209	11,418	10,354	10,310	9,864	9,864
Log pseudolikelihood	-187.6	-216.7	-216.1	-174.6	-178.3	-178.1	-157.5	-157.5
Pseudo R-squared	0.0741	0.0703	0.0728	0.0823	0.0494	0.0498	0.0646	0.0647

Clustered standard errors in parentheses

The sample excludes instances where U.S. annual export change exceeds 300 percent

Traditional users: EU, Canada, and Australia

Table 9: Non-traditional Users (Attenuated Sample)-- Probit Estimates with Foreign AD Initiation as Dependent Variable (Marginal Probabilities)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP Growth	0.023	0.019	0.014	0.021*	0.022**	0.023**	0.021*	0.021*
(-)	(0.041)	(0.011)	(9.5 x 10-03)	(0.013)	(0.011)	(0.011)	(0.011)	(0.011)
CA/GDP	-5.0 x 10-03	-0.018*	-0.022**	-0.015	-0.011	-0.011	-9.4 x 10-03	-9.4 x 10-03
(-)	(0.011)	(0.010)	(0.011)	(0.012)	(0.010)	(0.010)	(0.010)	(0.010)
Exchange Rate (change)	-4.5 x 10-04	-4.9 x 10-04	-7.0 x 10-04	-5.4x 10-04	-5.0 x 10-04	-4.9 x 10-04	-4.6 x 10-04	-4.6 x 10-04
(-)	(2.0 x 10-04)	(3.8 x 10-04)	(1.1 x 10-03)	(4.3 x 10-04)	(4.6 x 10-04)	(4.4 x 10-04)	(3.4 x 10-04)	(3.4 x 10-04)
Retaliation (sector)	-0.012	-0.25		-0.26	-0.14	-0.14	-0.14	-0.14
(+)	(0.12)	(0.16)		(0.16)	(0.17)	(0.17)	(0.17)	(0.17)
Deflection	0.017**	0.019**	0.016**	0.020**	0.014**	0.014**	0.014**	0.014**
(+)	(7.0 x 10-03)	(8.7 x 10-03)	(7.5 x 10-03)	(8.9 x 10-03)	(6.3 x 10-03)	(6.3 x 10-03)	(6.2 x 10-03)	(6.2 x 10-03)
Foreign Tariff (level)	-4.6 x 10-03							
(?)	(3.4 x 10-03)							
US Exports (change)	5.4 x 10-04	4.9 x 10-04	5.0 x 10-04*	3.7 x 10-04	2.8 x 10-04	2.8 x 10-04	3.4 x 10-04	3.4 x 10-04
(+)	(3.4 x 10-04)	(3.0 x 10-04)	(3.0 x 10-04)	(3.0 x 10-04)	(2.8 x 10-04)	(2.8 x 10-04)	(2.9 x 10-04)	(2.9 x 10-04)
US Exports (level)	3.6 x 10-4**	3.0 x 10-4**	3.0 x 10-4***	3.6 x 10-4**	1.9 x 10-4*	1.9 x 10-4*	1.9 x 10-4*	1.9 x 10-4*
(+)	(1.5 x 10-4)	(1.2 x 10-4)	(1.2 x 10-4)	(1.5 x 10-4)	(1.0 x 10-4)	(1.0 x 10-4)	(9.9 x 10-4)	(9.9 x 10-4)
Retaliation (aggregate)			0.015*					
(+)			(8.5e-03)					
HHI*US tariff				-4.5 x 10-7				
(+)				(8.5 x 10-07)				
Capital/Shipments					6.44***	6.44***	6.82***	6.83***
(+)					(1.95)	(1.97)	(2.28)	(2.28)
US Tariff						-1.1 x 10-03	-4.2 x 10-04	-4.2 x 10-04
(+)						(1.5 x 10-03)	(1.8 x 10-03)	(1.8 x 10-03)
Herfindahl Index							-2.9 x 10-05	-2.9 x 10-05
(+)							(8.9 x 10-05)	(8.9 x 10-05)
Change in Domestic Shipments								-2.8 x 10-03
(-)								(6.0 x 10-03)
Observations	21,638	34,542	34,542	27,655	24,984	24,874	23,831	23,831
Log pseudolikelihood	-454.6	-690.7	-691.3	-594.8	-516.7	-515.9	-497.1	-497.1
Pseudo R-squared	0.1100	0.0906	0.0898	0.1020	0.1170	0.1170	0.1190	0.119

Clustered standard errors in parentheses

The sample excludes instances where U.S. annual export change exceeds 300 percent

Non-traditional users: Argentina, Brazil, Colombia, China, India, Mexico, Korea, and South Africa