

# **Sanctuary Markets and Antidumping: An Empirical Analysis of U.S. Exporters**

## **Abstract**

Proponents of antidumping, especially in the United States, have long argued that foreign firms use profits obtained behind formal and informal barriers in their home markets as a way to “subsidize” aggressive pricing abroad. It has been difficult to analyze whether U.S. accusations of sanctuary markets have any basis in reality. On the one hand, authorities are not required to consider such behavior when administering antidumping. On the other, detailed information about internal market structure is difficult to obtain on a systematic basis in a host of countries exporting to the U.S.

This project exploits the increased targeting of U.S. exporters in antidumping actions to examine whether there is evidence of the sanctuary markets hypothesis in the U.S. home market. The work expands on the work of many authors who have examined the determinates of antidumping petition initiations. The empirical study focuses on economic factors that explain why these nations launch investigations against U.S. firms.

We find no evidence in support of the general proposition that U.S. firms facing frequent antidumping actions abroad are beneficiaries of a home market sanctuary. Instead, capital-intensive sectors that are successful exporters, especially those in sectors that are characterized by antidumping actions involving other countries, are more likely to experience antidumping actions. This evidence casts doubt on one of the main arguments used in favor of antidumping in the United States.

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**Introduction**

Proponents of antidumping duty procedures have pointed to a number of justifications for their inclusion in the WTO system. Chief among them is the long-standing argument about the “sanctuary market” hypothesis. The basic idea is that explicit and hidden barriers to competition in the home market will result in excessive profits, which in turn allows an exporting firm to price “unfairly” in foreign markets and thereby lead to material injury to domestic firms in that export market.

This argument is heard especially often in the United States where support for antidumping procedures is traditionally very strong. Many commentators in the 1980s, for example, accused the Japanese government with turning a blind eye towards anti-competitive actions of domestic firms, which in turned allowed these firms to take market share away from U.S. firms that were operating in a highly competitive market that was subject to vigorous anti-trust enforcement. The U.S. steel industry also argued that much of the import competition it faced was “subsidized” by market sanctuaries in Japan and Europe.

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

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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 not ever required any 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 they cause “material injury” to the import competing industry. In short, evidence about a “market sanctuary” are 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 for which are often difficult to obtain. Moreover, antidumping advocates in the U.S., for example, may not feel that official Japanese 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 countries around the world.

This purpose of this research is to 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.

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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 U.S. data to be reliable. 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 acknowledge 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.

Table 1 includes some basic information about the antidumping actions involving U.S. exporters from 1993 through July 2009.<sup>1</sup> We see that there have been 281 petitions brought against U.S. firms over that period. Mexican firms are the most frequent initiators of antidumping actions against U.S. companies over the period with 57 cases, followed by Brazil (37 cases), China (34 cases), and India (33 cases). One notable aspect of this lineup is that these are all “new” users of antidumping in the international economic system and that none of the other “traditional” users (i.e. the European Union, Canada, and Australia) are in this top five list. Moreover, if we consider the number of cases since 2004 (inclusive), the three largest users of antidumping against the U.S. are India, China, and Brazil, all of which are among the large emerging important potential export markets for U.S. firms. 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 increased restrictions.

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<sup>1</sup> This information is based on Bown (2009).

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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 (2009b), who estimate a probit model for country-industry pairs and control for imports, a number of macroeconomic conditions, and reactions against other countries' antidumping actions. This work will expand on that study by including detailed industry information available from the U.S. Commerce's Census of Manufacturing accumulated every five years. These latter variables (all at the six digit North American Industrial Classification Schedule (NAICS) code level) will include the standard measures of industrial concentration, and measures of high entry and exit costs in the industry. The time period analyzed will be from 1995 to 2004, which is determined by data availability.

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. tariffs that "keep out" foreign imports, high entry costs, and measures of sectoral competitiveness) will also help predict antidumping filings U.S. exporters subject to antidumping petitions abroad. If the econometric evidence is consistent with this hypothesis, then one could conclude that the 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. If evidence arises that is inconsistent with this hypothesis, antidumping actions against U.S. firms

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may be interpreted as mere protectionism and undercuts 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. Bown (2008), Miranda et al. (1998), Prusa (2001), and Zanardi (2004)). In addition, study of antidumping actions is important since they represent allowed exceptions to some of the most important WTO principles: non-discrimination, national treatment, and bound tariffs.

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)). In recent

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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.<sup>2</sup>

As noted in the beginning, 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 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

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<sup>2</sup> See for example, Prusa and Skeath (2004), Bown and Blonigen, Bown and Crowley (2007), Moore and Zanardi (2009a), Feinberg and Reynolds (2006).

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monopolist gains access to the world market where it can sell for the  $P_w$ . For simplicity, 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  $Q_3$  for the domestic market and  $Q_2$ - $Q_3$  for the international market. Note that the expansion of production into the world market to  $Q_3$  from  $Q_1$  results in lower average total costs, now at  $ATC_2$ . 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.,  $P_w < AC_2$ ).<sup>3</sup> In addition, it is practicing international price discrimination by selling at home ( $P_2$ ) above what it charges abroad ( $P_w$ ). 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. 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:

A government's industrial policies or key aspects of the economic system supported by government inaction can enable injurious

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<sup>3</sup> 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.



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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)

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) U.S. barriers to international arbitrage; and 3) high fixed costs, that would be

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associated with possible declining average costs. It is important to note that without the first two characteristics, the MS strategy would not be possible.

## **II. Descriptive Statistics**

I first consider some of the general patterns of antidumping use against U.S. exporters over the last fifteen years to motivate some preliminary evidence of whether U.S. firms accused of dumping conform to some of the broad expectations of the market sanctuary hypothesis.

Table 2 includes a breakdown of antidumping initiations facing U.S. exporters as well as all other countries. We see that there were 281 petitions initiated against U.S. firms compared to a world total of 4,597. This means that U.S. exporters faced antidumping actions in 6.1 percent of all cases internationally from 1993 to 2008. To put this in some perspective, U.S. merchandising exports in 2008 equaled \$1.3 trillion out of a world total of \$15.8 trillion, or approximately 8 percent of world trade. (WTO World Trade Report, 2009). China, on the other hand, was the target of 932 antidumping petitions for the period (or 20 percent of the total) although its 2008 world trade share was only 9 percent. The high frequency of antidumping acts against China is of course a reflection of its explosive growth in world trade in recent years. Other important antidumping targets include the EU-29 (702 cases), India (170), and Japan (197 cases).

These figures suggest that the U.S. exporters face antidumping petitions more or less in line with its share of world merchandising trade.

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Table 3 includes a breakdown of antidumping initiations by major product categories based on the 6-digit North American Industrial Classification System (NAICS),<sup>4</sup> which is a level of aggregation more or less similar to the ISIC 4-digit level.

Over the last fifteen years, antidumping cases targeting U.S. exporters have become increasingly focused on the chemical industry, broadly defined. For the period as a whole, the most frequently targeted U.S. export sector was plastics (NAICS 325211) at 10.7 percent, followed by organic chemicals (NAICS 325199) at 8.5 percent, synthetic rubber (NAICS 325212) at 5.7 percent, and inorganic chemicals (NAICS 325188) at 3.6 percent. All together, these sectors combine for a total of 28 percent of all U.S. antidumping cases, compared to 17 percent for all non-U.S. cases. For other 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.

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 very 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.

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<sup>4</sup> 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 (2009) provided further corroboration for the candidate NAICS code.

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In Table 4, we display various measures for capital intensity and fixed costs for overall manufacturing and for the U.S. sectors most frequently cited in foreign antidumping actions, the data for which are taken from the 1997 U.S. Census of Manufacturing. These measures for the NAICS sectors include the capital-labor stock, 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, defined as book value divided by the three year shipment value (for years t-2, t-1, and t).<sup>5</sup>

We see that the average capital-labor ratios for all US. Manufacturing sectors was 103 compared to 610 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 with an average of 0.035 for all industries in the sample compared to 0.069 for organic chemicals, 0.061 for plastics and 0.055 for synthetic rubber. Steel is once again less of an outlier from the overall industry average with a ratio of 0.043.

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 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.

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<sup>5</sup> The book value of industrial sectors is collected by the U.S. Census every five years so that the capital-labor and capital-shipment ratios are reported only for 1997.

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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 1000 and 1800 to be a moderately concentrated industry, with the potential for anticompetitive behavior increasing as the HHI value increases.<sup>6</sup> Column 3 of Table 3 shows the HHI calculated on the basis of value added for the top 50 firms in the sector. The 1997 average for all industries for which the HHI can be calculated<sup>7</sup> equals 763 compared to 332 for plastics, 237 for organic chemicals, 654 for and inorganic chemicals. Only synthetic rubber has an HHI that comes close to the overall manufacturing average. These figures do not suggest that U.S. industries frequently facing antidumping petitions in export markets are not less competitive than average, the HHI for them is far below what the U.S. Department of Justice would deem to be problematic.<sup>8</sup> The share of sector value-added by the top four firms is an alternative measure of industry concentration. Column 4 of Table 4 once again suggests that these four manufacturing sectors are, if anything, are more competitive than the U.S. manufacturing sector as a whole.

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 2 of Table 3 includes the average sectoral applied most-favored-nation tariff rates<sup>9</sup> for these sectors as well as the overall manufacturing sector for the period 1993-2004. We see that the manufacturing

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<sup>6</sup> See "<http://www.usdoj.gov/atr/public/testimony/hhi.htm>."

<sup>7</sup> 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.

<sup>8</sup> Note that 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.

<sup>9</sup> 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.

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sector average tariff of 4.8 percent is higher than any of the five sectoral averages. It is important to note that these averages do not reflect any non-tariff barriers such as quotas, import licenses, or invisible import restrictions. Nonetheless, 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 international market to keep their average total production costs down. But we do not see any 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.

This relationship is naturally examined using a Probit model since the researcher

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cannot observe underlying utility of foreign industry contemplating filing a petition. Instead, the researcher only sees whether a petition has been filed or not. Thus, the probability of a filing is characterized by the following:

$$P(y_{ikt} = 1) = \Phi(\alpha + \beta_1 X_{ikt-1} + \beta_2 R_{t-1} + \beta_3 M_{t-1}) \quad (1)$$

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.

Information about conditions inside country  $i$  are included in  $X_{ikt-1}$ . This will include both sector-specific information or at the 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. Finally  $M_{t-1}$  includes various regressors associated with the market sanctuary hypothesis. I will also include fixed effects for the year and the importing country to control for unobservables. The estimated coefficients for the fixed effects are suppressed for space considerations but of course are available on request.

Note that in all the specifications each regressor is lagged one period from the year in which the probability of an initiation is assessed since antidumping authorities look at past performance 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.

The data analysis will not include the universe of all countries using antidumping nor all product categories.

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I restrict the sample to manufacturing sectors alone because the U.S. Census does not collect detailed data for agricultural sectors. In any event, almost all of the cases involving U.S. firms are in the manufacturing sector.

I only include a twelve importing nations 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. The analyzed countries are either traditional frequent users of antidumping (the European Union, Canada, and Australia) or countries that have become important new users of antidumping (Brazil, China, India, Mexico, Korea, Turkey, and South Africa).

Information about the petitions filed against the U.S. comes from two sources: Moore and Zanardi (2009a) and Bown (2009), 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 for each year analyzed. This level of aggregation is more detailed than often used in the literature (e.g., Moore and Zanardi (2009a and 2009b) and Feinberg and Reynolds (2007)) but less detailed than the 6, 8, or even 10 digit Harmonized System Code categorization used by administering authority. The 6-digit NAICS level does allow me to utilize the U.S. Census detailed industrial data.



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The matrix  $X_{ikt-1}$  includes information about the importing country that have been found in the literature to be important in explaining antidumping petitions. Variable names, sources, and basic descriptive statistics are included in Table 5.

I include the percentage change in the importing country applied MFN tariff (from t-3 to t-1), defined as a positive number (“Foreign Tariff (change)”). Also included is the tariff level in time t-3 (“Foreign Tariff (level)”). The expected sign for the coefficient on “Foreign Tariff (change)” is positive; the greater the level of recent trade liberalization and more exposure to international competition, the more likely that an industry will file a petition.<sup>10</sup> The expected sign for “Foreign Tariff (level)” is ambiguous. On the 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. Both variables are presented in the original World Bank data at the ISIC 3-digit level, was converted to NAICS.

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

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<sup>10</sup> Note that Moore and Zanardi (2009b) do find that this variable helps explain antidumping petitions only for “heavy” users of antidumping, a group that includes many of the countries in this data set.)

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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 1997-2004. 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<sup>11</sup>; 2) the three year average GDP growth (“GDP Growth”) rate in the importing country, obtained from the World Bank’s *World Development Indicators* for years  $t-3$  through  $t-1$ , and 3) the three-year average importing country current account to GDP ratio, also obtained from the World Bank’s *World Development Indicator* (“Current Account”).

The 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.

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<sup>11</sup> The euro-dollar exchange rate was used for all European Union members and the ecu-dollar rate for pre-1999.

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The coefficient for “GDP Growth” should be negative. The higher overall domestic economic activity, the less likely that domestic firms will be in economic distress, and the less likely that they will decide to file an antidumping petition. Using sectoral consumption data in the importing country would be preferable in principle but this variable 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 petitions. Deflection refers to the possibility, first noted by Bown and Crowley (xxxx), that antidumping petitions filed abroad can divert trade to Country  $i$  and thereby trigger AD cases by Country  $i$ .

Two versions of the retaliation variables are included in the data set. The first is “Retaliation (sector),” which is the number of US cases filed against the importing country  $i$  in year  $t-1$  in sector  $j$ . The second is “Retaliation (aggregate),” which is the number of US 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 the 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.

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I also include, alternatively, “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.

I report the results for three variables for U.S. 6-digit NAICS categories associated with the MS hypothesis: 1) capital-labor ratio; 2) sectoral average tariff  $a$ ; and 3) the fifty firm HHI for value-added. The expected value for the coefficients of each one is positive. The first and third are based on the detailed sectoral data collected in the 1997 Census of Manufacturing. The sectoral tariff data are once again from the World Bank's Trade and Production Database.

The “U.S. Capital/Labor” ratio is defined as the book value (in thousands of U.S. dollars) divided by the total number of employees of all firms in 1997. 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 Herfindhal-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 year  $t-1$  and consequently varies for each year.<sup>12</sup>

A final control variable is included in the estimations “U.S. Demand Shock” is also included in one specification. This variable is the percentage change from  $t-2$  to  $t-1$

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<sup>12</sup> Note that the World Bank's TPD does not include U.S. tariffs data for 1994. Consequently, I use a simple average for 1993 and 1995 for the missing data.

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of net 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.

#### **IV. Econometric Results**

Table 6 includes the results from the Probit estimations. Note that the reported coefficients are the marginal increased probabilities of observing an antidumping initiation when the value of the regressor increases infinitesimally.

The first 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.<sup>13</sup> Some of the regressors did surprisingly poorly in predicting cases against U.S. firms.

For example, a number of authors, including Moore and Zanardi (2009b) and Feinberg and Reynolds (2008) find that the bilateral exchange rate can play an important role in explaining antidumping petitions. For the former study, the sample included a much larger group of countries but in the latter U.S. exporters were analyzed. The differences for the U.S. cases simply may reflect the more aggregated nature of the Feinberg and Reynolds study (with observations defined for 14 Harmonized System

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<sup>13</sup> A similar Probit estimation was run without year or country fixed effects to assess the possibility of any problems associated with the “incidental parameter” problem. The coefficient estimates and pattern of statistical significance was virtually unchanged.

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categories) rather than the more disaggregated data for this study (with 473 NAICS categories). The lack of explanatory power for the bilateral exchange rate compared to the earlier Moore and Zanardi (2009b) study may also reflect fixed exchange rates (for example with Argentina) or that the U.S. dollar is often used for international contracts with extensive hedging options available. In any event, this variable shows little ability to help explain the patter of cases brought against U.S. firms.

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 (sector)” or a broader reaction against U.S. antidumping actions in all sectors “Retaliation (aggregrate).” These results are also surprising given the outcomes of many studies such as Bown and Crowley (2007). The lack of statistical significance for the coefficient on “U.S. Exports (change)” is also particularly surprising as it indicates that surges in U.S. sales in the domestic economy is unlikely to help explain later antidumping petitions. This also stands in stark contrast to the results found in Moore and Zanardi (2009b) for a group of developing and developed countries where increased exports raised the probability of observing a petition.

There is explanatory power in three regressors in column 1, though the marginal probabilities remain small.

Similar to other studies, 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

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that the coefficient for level of foreign tariff is negative and statistically significant from zero. This is consistent with a world in which foreign firms with lower tariff protection use antidumping actions to protect themselves against U.S. exports. Finally, a high *level* of U.S. exports to a particular sector raises the probability of observing an antidumping petition.

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 remain qualitatively identical to column (1).)

In column (3) of Table 6, I add the U.S. Capital/Labor ratio in the 6-digit NAICS category to the basic specification. The coefficient estimates indicate that U.S. manufacturing sectors high capital-labor ratios are more likely to face antidumping actions abroad. I also use alternative measures not reported here including the ratio of book value to value of shipments for 1997 as well as the book value to the three-year total shipments for  $t-3$  through  $t-1$ . The results in these Probit estimations are qualitatively identical to those reported for the capital-labor ratio. 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 foreign firms may be targeting U.S. companies that might be in the position to use such a strategy.

Column (4) of Table 4 includes two further variables that help us examine the MS hypothesis. We see that including the U.S. tariff and the Herfindahl-Hirschmann

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index provide no statistically significant explanatory power for explaining cases against American companies. 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 qualitatively identical to those reported later.

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. 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. It is conceivable that foreign companies are not targeting other U.S. sectors that conform better to the conditions of the market sanctuary hypothesis but this seems unlikely.

I finally include the measure of recent U.S. changes in net domestic shipments as an explanatory variable in column (6). 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 at home by ramping up exports. In fact, we see no evidence that dropping U.S. shipments helps explain the pattern of cases brought against American firms.

## **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



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1995-2004 period. 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 or 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 American 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. Surprisingly, there is no systematic evidence that recent surges in American exports play a role in encouraging initiations; instead, the level is what matters. 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.

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 understand

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whether firms in other countries operate behind closed uncompetitive markets that then “unfairly” compete with U.S. companies. 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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**References**

- Blonigen, Bruce A. and Chad P. Bown (2003), "Antidumping and Retaliation Threats," *Journal of International Economics*, 60(2), 249-73.
- Bown, Chad P. (2006), "Global Antidumping Database, Version 1.0," World Bank Policy Research Paper No. 3737.
- Bown, Chad P. (2008), "The WTO and Antidumping in Developing Countries," *Economics and Politics*, 20(2), pp. 255-88.
- Bown, Chad P. and Meredith A. Crowley (2007), "Trade Deflection and Trade Depression," *Journal of International Economics*, 72(1), 176-201.
- Feinberg, Robert (1989), "Exchange Rates and Unfair Trade," *Review of Economics and Statistics*, 71(4), 704-07.
- Feinberg, Robert (2005), "U.S. Antidumping Enforcement and Macroeconomic Indicators Revisited: Do Petitioners Learn?" *Review of World Economics*, 141(4), 612-22.
- Feinberg R., & Kara Reynolds, K.. (2008). Friendly Fire? The Impact of US Antidumping Enforcement on US Exporters. *Review of World Economics*, 144(2), 366-378
- Feinberg, Robert and Kara Reynolds (2006), "The Spread of Antidumping Regimes and the Role of Retaliation in Filings," *Southern Economic Journal*, 72(4), 877-90.
- Feinberg, Robert and Kara Reynolds (2007), "Tariff Liberalization and Increased Administrative Protection: Is There a Quid Pro Quo?," *World Economy*, 30(6), 948-61.
- Finger, J. Michael and Julio J. Nogués (2005) (eds.), *Safeguards and Antidumping in Latin American Trade Liberalization: Fighting Fire with Fire*, Palgrave: New York.
- Francois, Joseph and Gunnar Niels (2006), "Business Cycles, the Current Account and Administered Protection in Mexico," *Review of Development Economics*, 10(3), 388-99.
- Knetter, Michael M. and Thomas J. Prusa (2003), "Macroeconomic Factors and Antidumping Filings," *Journal of International Economics*, 61(1), 1-18.
- Mastel, Greg (1998), Antidumping Laws and the U.S. Economy Armonk, NY: ME Sharpe
- Moore, Michael and Maurizio Zanardi (2009a), "Does Antidumping Use Contribute to Trade Liberalization in Developing Countries?" *Canadian Journal of Economics*, 42(2), pp. 469-495.

**Very Preliminary. Please Do Not Quote Without Author's Permission**

Moore, Michael and Maurizio Zanardi (2009b), "Trade Liberalization and Antidumping: Is There a Substitution Effect?" mimeo.

Miranda, Jorge, Raul. A. Torres and Mario Ruiz (1998), "The International Use of Antidumping: 1987-1997," *Journal of World Trade*, 32(5), 5-71.

Nicita, Alessandro and Marcelo Olarreaga (2007), "Trade, Production and Protection 1976-2004," *World Bank Economic Review*, 21(1), 165-71.

Prusa, Thomas J. (2001), "On the Spread and Impact of Anti-Dumping," *Canadian Journal of Economics*, 34(3), 591-611.

Prusa, Thomas J. and Bruce A. Blonigen (2003), "Antidumping," in E. Kwan Choi and James Harrigan (eds.), *The Handbook of International Trade*, Blackwell: Oxford.

Prusa, Thomas J. and Susan Skeath (2004), "Modern Commercial Policy: Managed Trade or Retaliation?," in E. Kwan Choi and James Hartigan (eds.), *The Handbook of International Trade*, vol. 2, Blackwell: Oxford.

United States (2002), "Basic Concepts and Principles of the Trade Remedy Rules," Submission to World Trade Organization, Document TN/RL/W/27.

World Trade Organization (2009), World Trade Report 2009, WTO: Geneva.

Zanardi, Maurizio (2004), "Antidumping: What are the Numbers to Discuss at Doha?" *World Economy*, 27(3), 403-33.

# Figure 1: Sanctuary Market

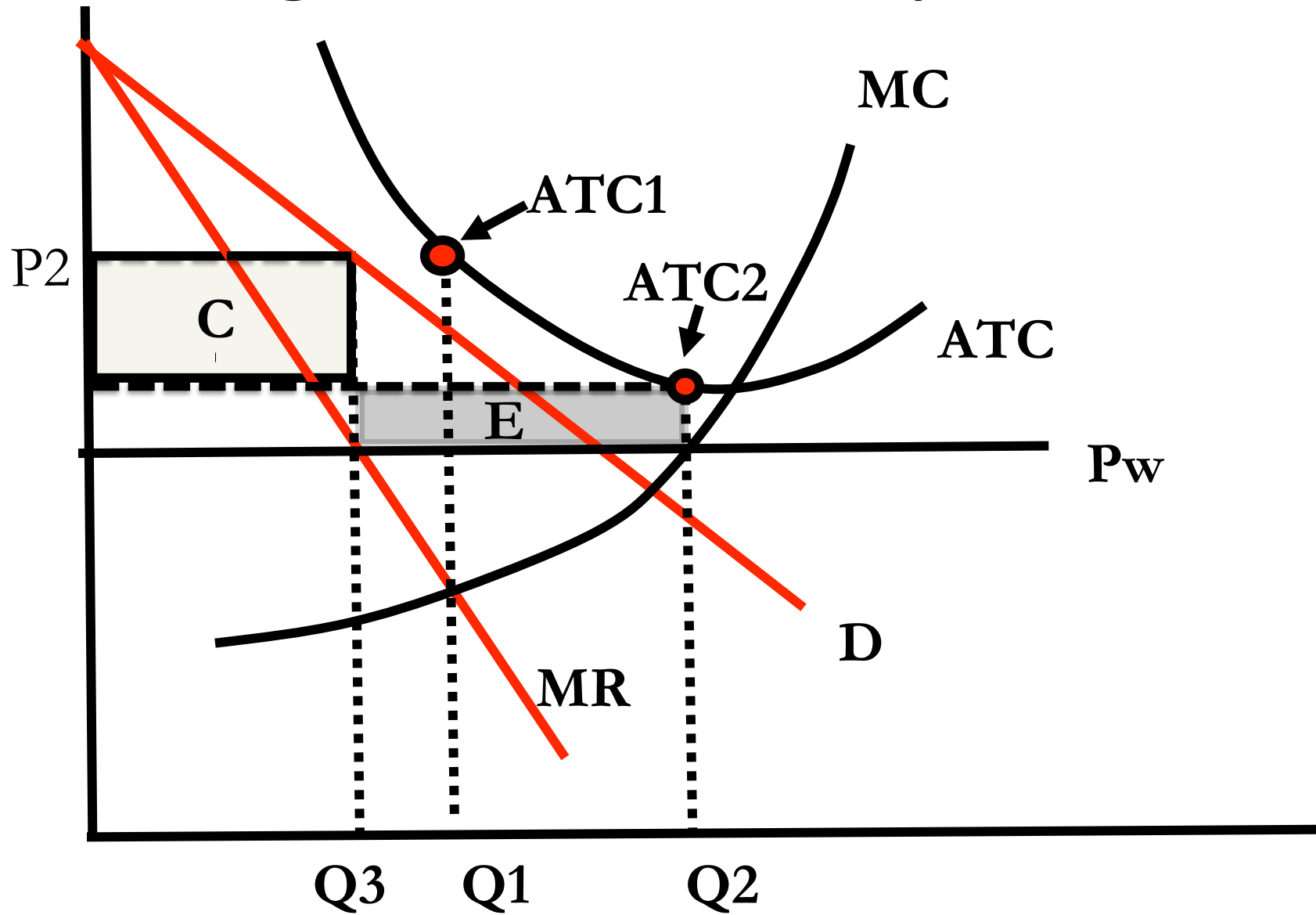


Table 1: Antidumping Petitions Against U.S. Firms  
(January 1993 through July 2009)

	Total	Since 2004 (inclusive)
Mexico	57	4
Brazil	37	11
China	34	18
India	33	10
Canada	25	5
South Africa	19	8
EU	17	8
South Korea	12	0
Argentina	11	1
Australia	11	1
Others	25	4
Total	281	11

Source: Bown (2009)

Table 2: Antidumping Initiations (January 1993 through July 2009)

	As Initiating Country	As Target Country	Share of Total AD Initiations as Target Country	Country Share of 2008 World Merchandise Trade
U.S.	592	281	6.1%	8.2%
China	223	932	20.3%	9.1%
EU	487	702	15.3%	37.5%
India	754	170	3.7%	1.1%
Brazil	300	156	3.4%	1.3%
Canada	202	42	0.9%	2.9%
Japan	7	197	4.3%	5.0%
Others	2033	2118	44.2%	35.0%
Total	4597	4597		

Source: Bown (2009) and WTO (2009)

Table 3: Antidumping Initiations Categorized by NAICS\* Code

NAICS sector (NAICS code)	All**	US
Plastics (325211)	201 (4.7%)	30 (10.7%)
Organic Chemicals (325199)	308 (7.1%)	24 (8.5%)
Iron and Steel (331111)	930 (21.5%)	19 (6.8%)
Synthetic Rubber (325212)	57 (1.3%)	16 (5.7%)
Inorganic Chemicals (325188)	165 (3.8%)	10 (3.6%)
Broadwoven Fabric Mills (313210)	130 (3.0%)	1 (0.4%)
Yarn Spinning Mills (313111)	81 (1.9%)	0 (0.0%)
All Others	2444 (56%)	181 (64%)
	4316	281

\* North American Industrial Classification System

\*\* All initiations exclusive of actions against U.S. firms

Source: Bown (2009) and author's calculations



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

	Capital/Labor <sup>a</sup>	Capital/Shipment <sup>b</sup>	Herfindahl-Hirschman Index <sup>c</sup>	Share of Value-Added of Top Four Firms	U.S. Applied MFN Tariff
Overall Manufacturing	103	0.035	763	41.8	4.7
Plastics (325211)	610	0.062	332	29.2	3.5
Organic Chemicals (325199)	503	0.069	237	22.5	2.5
Synthetic Rubber (325212)	342	0.055	725	45.5	3.5
Inorganic Chemicals (325188)	243	0.059	654	39.3	1.8
Iron and Steel (331111)	253	0.042	560	39.1	1.9

<sup>a</sup> Book value (in thousands of U.S. dollars) divided by the total number of employees of all firms in 1997; <sup>b</sup> Book value divided by the three-year shipment value (for years t-2, t-1, and t); <sup>c</sup> Based on value-added of 50 top firms in sector.

Source: U.S. Bureau of Census

**Table 5: Probit Estimates with Foreign AD Initiation as Dependent Variable (Marginal Probabilities)**

	Expected sign	(1)	(2)	(3)	(4)	(5)
GDP Growth	-	-0.0061 (0.011)	-0.0052 (0.011)	-0.00479 (0.00779)	-0.00594 (0.00704)	-0.00193 (0.00142)
CA/GDP	-	6.79 x 10 <sup>-4</sup> (0.022)	-7.4 x 10 <sup>-4</sup> (0.022)	-0.00166 (0.0153)	-0.00248 (0.0137)	0.0255 (0.0303)
Exchange Rate (change)	-	-3.19 x 10 <sup>-4</sup> (3.03 x 10 <sup>-4</sup> )	-3.12 x 10 <sup>-4</sup> (2.96 x 10 <sup>-4</sup> )	-3.19 x 10 <sup>-4</sup> (3.03 x 10 <sup>-4</sup> )	-1.78 x 10 <sup>-4</sup> (1.83 x 10 <sup>-4</sup> )	-0.00224 (0.00169)
Retaliation (sector)	+	0.0185 (0.0326)		0.0179 (0.0218)	0.0176 (0.0196)	0.0426 (0.0338)
Retaliation (aggregate)	+		0.00761 (0.0131)			
Deflection	+	0.0102 *** (0.00268)	0.0107 *** (0.00268)	0.00589 *** (0.00181)	0.00495 *** (0.00165)	0.00559 *** (0.00218)
Foreign Tariff (level)	?	-0.0142 *** (0.00435)	-0.0146 *** (0.00443)	-0.00642 ** (0.00295)	-0.0061 ** (0.00276)	-0.0073 * (0.00544)
Foreign Tariff (change)	+	-0.00124 (5.17 x 10 <sup>-4</sup> )	-0.0012 (5.23 x 10 <sup>-4</sup> )	-8.87 x 10 <sup>-4</sup> (3.49 x 10 <sup>-4</sup> )	-9.54 x 10 <sup>-5</sup> (3.30 x 10 <sup>-4</sup> )	-3.81 x 10 <sup>-4</sup> (4.86 x 10 <sup>-4</sup> )
US Exports (change)	+	-1.70 x 10 <sup>-4</sup> (2.16 x 10 <sup>-4</sup> )	-1.68 x 10 <sup>-4</sup> (2.17 x 10 <sup>-4</sup> )	-1.70 x 10 <sup>-4</sup> (2.16 x 10 <sup>-4</sup> )	-7.86 x 10 <sup>-5</sup> (1.31 x 10 <sup>-4</sup> )	-2.91 x 10 <sup>-4</sup> (2.37 x 10 <sup>-4</sup> )
US Exports (level)	+	6.46 x 10 <sup>-11</sup> *** (2.08 x 10 <sup>-11</sup> )	6.44 x 10 <sup>-11</sup> *** (2.07 x 10 <sup>-11</sup> )	4.00 x 10 <sup>-11</sup> *** (1.50 x 10 <sup>-11</sup> )	3.71 x 10 <sup>-11</sup> *** (1.42 x 10 <sup>-11</sup> )	4.58 x 10 <sup>-11</sup> *** (2.16x 10 <sup>-11</sup> )
US Capital/Labor	+			4.32 x 10 <sup>-4</sup> *** (1.20 x 10 <sup>-4</sup> )	3.91 x 10 <sup>-4</sup> *** (1.19x 10 <sup>-4</sup> )	5.38 x 10 <sup>-4</sup> *** (1.85 x 10 <sup>-4</sup> )
US Tariff	+				4.91 x 10 <sup>-4</sup> (0.00107)	8.74 x 10 <sup>-4</sup> (0.00157)
H-H Index	+				-2.42 x 10 <sup>-4</sup> (2.10 x 10 <sup>-5</sup> )	-5.75 x 10 <sup>-5</sup> (3.94 x 10 <sup>-5</sup> )
US Domestic Demand (change)	+					0.00765 (0.0592)
Pseudo R <sup>2</sup>		<b>0.16</b>	<b>0.16</b>	<b>0.25</b>	<b>0.26</b>	<b>0.26</b>
Observations		<b>18,582</b>	<b>18,582</b>	<b>18,531</b>	<b>17,761</b>	<b>9,994</b>

Year and importing country fixed effects included in all estimations. \*, \*\*, \*\*\*: Significantly different from zero at 10, 5, and 1 percent, respectively.