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8 Differences in the Uses and Effects of Antidumping Law across Import Sources

Robert W. Staiger and Frank A. Wolak

8.1 Introduction

Given the success with which tariff reductions have been negotiated during the postwar period, it is not surprising that the rules which govern the exceptions from the negotiated tariff bindings have replaced the tariff bindings themselves as the central focus of international cooperation in trade policy. In 1947, the principal task confronting the contracting parties of the General Agreement on Tariffs and Trade (GATT) was the reciprocal lowering of high statutory trade barriers in place at that time. Today, in contrast, the heart of international trade policy negotiation consists of such issues as the conditions under which countries can reimpose temporary "safeguard" protection, the rules under which one country can impose a countervailing duty on another's subsidized exports, and procedures for settling disputes concerning the interpretation of these and other trade rules as they arise.

Nowhere is this change in emphasis more apparent than in the rising friction associated with antidumping law. Accusations that foreign firms are "dumping" products onto the domestic market and the belief that dumping is injurious to the domestic industry are by no means new.[1] Almost 80 years ago, such

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1. Dumping is defined as exporting products to the domestic market at export prices "below fair value," i.e., either below the prices of comparable products for sale in the domestic market of the exporting country or below costs of production.

accusations and beliefs led the United States to adopt its first antidumping legislation, as contained in sections 800–801 of the Revenue Act of 1916. But while the original intent of the law was to protect U.S. firms from the "unfair competition" implied by the alleged dumping practices of the highly cartelized and heavily protected German industries of the period (see Viner 1966, 242), antidumping law today seems to elicit a much broader usage.[2]

With the use and abuse of antidumping law now regularly a central concern of both multilateral and bilateral trade negotiations, it is especially important to have as full an understanding as possible of the impact of existing antidumping laws on the free flow of trade, and of the uses to which antidumping law is put in practice. In this regard, several researchers have challenged the view that antidumping law restricts trade only when antidumping duties are actually imposed, arguing that the threat or even the mere possibility of duties can also affect import flows. We explore in this paper the differences across import sources in the uses and effects of antidumping law, accounting for both direct as well as possible indirect effects on imports and domestic import-competing output.

In an earlier paper (Staiger and Wolak 1994a) we studied three possible channels through which these indirect effects might arise that when combined with the direct effects of duties capture most of the trade effects of antidumping law. We referred to these three nonduty effects as the "investigation effect," the "suspension effect," and the "withdrawal effect." The first refers to the trade distortions associated with ongoing antidumping investigations, the second to the effects of "suspension agreements" (under which investigations are suspended in exchange for a promise by foreign firms to stop dumping), and the third to the effects of petitions that are withdrawn prior to a final determination. Our empirical findings, which reflected data on the timing and outcome of every antidumping investigation that covered a manufacturing industry product in the United States during the 1980–85 period, indicated that the investigation and suspension effects are substantial. Specifically, we found that suspension agreements lead to trade restrictions similar in magnitude to what would have been expected if antidumping duties were imposed instead. The effect of a typical antidumping investigation is to reduce imports during the period of investigation by roughly half the reduction that could be expected if antidumping duties had been imposed from the beginning of the investigation. We found little evidence to support a significant withdrawal effect.

Our focus on the broader trade effects of antidumping law also allowed us to consider the possibility that different firms might file antidumping petitions for different reasons. In particular, we found evidence of two distinct filing strategies that appeared to coexist in the data, and we referred to firms as "out-

2. This broadening usage was in part facilitated by explicit changes in U.S. antidumping law. For example, under the original U.S. law, predatory intent had to be shown to establish a finding of dumping. However, the Revenue Act of 1921 dropped the intent requirement.

come filers" or "process filers" depending on which strategy they appeared to be using. Outcome filers are firms that file antidumping petitions in anticipation of obtaining a finding of dumping and the relief that comes with it (either antidumping duties or a settlement agreement). Process filers are firms that file antidumping petitions, not to obtain a dumping finding, but rather to obtain the effects that arise solely from the investigation process itself. Our estimates suggested that while outcome filers are by far the dominant users of antidumping law, process filing was the likely strategy used by between 3 and 4 percent of the industries in our sample.

In the present paper we continue this line of research by looking for evidence of differences in the use and impacts of U.S. antidumping law as it is applied to imports from different trading partners. As we discuss in the next section, whether an antidumping petition is initiated for process or for outcome should depend not only on the characteristics of the domestic industry but also on the characteristics of the exporting country or countries against which the petition is filed. In our earlier work we allowed for the possibility that filing strategies might differ across U.S. industries, but we required firms in a given industry to pursue a common filing strategy against foreign imports, regardless of the country of origin. In this paper we allow the filing strategies of firms to be different for different import sources, but we impose the restriction that firms in all U.S. industries pursue the same overall filing strategy. Thus, we consider the possibility that U.S. firms may be outcome filers against imports from some countries and process filers against others.

Using this method of analysis we are able to quantify significant differences in filing strategies used by U.S. industries against five sets of trading partner countries. We are also able to quantify the extent of import and domestic output distortions due to the various stages of the suit resolution process for each of these five sets of trading partners. Finally, we are able to distinguish between regions exporting to the United States that are primarily targets of process filings by U.S. industries, as well as those regions that are primarily targets of outcome filings by U.S. industries.

We argue that the countries most likely to be the targets of process filings in the United States during our 1980–85 sample period are those whose export production over this period is predominantly destined for the U.S. market and accounts for a relatively large and stable U.S. market share. These characteristics point to Canada and Mexico as countries against which process filing by U.S. firms is likely to occur. Analyzing the filing behavior against imports from Canada and Mexico as well as against imports from four other regional groupings, we find evidence in the filing behavior and in the nature of the trade impacts which accompany filing to suggest that Canada and Mexico were indeed the most likely targets of antidumping petitions filed under the process filing strategy during our sample period. The regions against which the filing strategy of U.S. firms and the nature of the associated trade impacts seems most consistent with our outcome filing view of antidumping suit activity are

the countries of Western Europe and the region composed of Japan and the newly industrialized countries (NICs) of East Asia.

The rest of the paper proceeds as follows. The next section briefly describes our motivation for including investigation, suspension, and withdrawal effects with the duty effects when quantifying the impact of antidumping law on imports and domestic output. It then describes the different investigation effects expected under outcome and process filing strategies. We also discuss in this section why some countries are more likely to be the target of process filing by U.S. firms than others. This discussion motivates the regional grouping of U.S. imports that we employ to carry out our empirical analysis. Section 8.3 then describes our data and model for estimation and presents the results. Section 8.4 concludes with an interpretation of our findings.

8.2 U.S. Antidumping Law

In this section we motivate why we believe it is important to consider the effects of suspension agreements, withdrawn petitions, and the investigation process itself, in addition to the effects of duty imposition, when quantifying the impacts of antidumping law on imports and domestic output. We also describe the different investigation effects on imports and domestic output that would be expected to arise under outcome and process filing. We then describe domestic filing behavior under these two filing strategies.[3] Finally, we discuss why some countries are more likely to be the target of process filing by U.S. firms than others.

We begin by making several observations concerning the practice of antidumping law in the United States which may be helpful to keep in mind. First, there are two findings necessary for a determination of dumping: (1) sales of imports at less than fair value (LTFV) and (2) material injury to the domestic industry due to these imports. One government agency is assigned to each of these determinations—the International Trade Commission (ITC) determines injury to the domestic industry and the Commerce Department's International Trade Administration (ITA) makes the LTFV determination. A second point to bear in mind is that for each of these decisions there is a preliminary and final decision made by each agency. The statutory time allotted for the entire investigation ranges from 10 months to 14 months under special circumstances. Finally, except in "critical circumstances" (a condition described more fully below but in practice rarely met), a final determination of dumping will bring the retroactive imposition of antidumping duties on all imports of the relevant products which entered the United States on or after the date of the preliminary LTFV finding, provided that the preliminary LTFV finding was affirmative (as it was for 93 percent of the products whose investigations made it to this stage of the investigation process during the 1980–85 period). With these general

3. A more detailed discussion of these points is contained in Staiger and Wolak (1994a).

points in mind we now turn to a discussion of the various potential trade-distorting effects of antidumping law.

8.2.1 The Trade Effects of Antidumping Law

A simple view of the trade effects of antidumping law would hold that trade flows are only affected by antidumping law when a petition is filed, dumping is found, and antidumping duties are imposed. Were this indeed the case, one could get a fairly complete understanding of the trade effects of antidumping law by examining those instances where antidumping duties were actually imposed. However, there are a number of reasons to believe that this simple view is inadequate, that many of the effects of antidumping law are indirect and subtle, and that a narrow focus on antidumping duties alone would overlook important nonduty channels through which antidumping law could act. We now describe three nonduty effects which, we believe, when combined with the effects of duties, capture a major component of the possible trade effects of antidumping law.[4]

Investigation Effect

First, it is often claimed (see, e.g., Dale 1980, 85–86; U.S. Congress, House 1978, 12, 278) that imports are restricted during the period over which an antidumping investigation is ongoing. As described more fully in Staiger and Wolak (1994a), there are two broad hypotheses concerning the reasons for and nature of this investigation effect. We refer to these two hypotheses as the "outcome filer" hypothesis and the "process filer" hypothesis. According to the outcome filer hypothesis, the investigation effect reflects actions taken by domestic importers and/or foreign exporters in anticipation of the duties that would be imposed in the event of a final affirmative dumping determination and that would be assessed retroactively back to the date of an affirmative preliminary LTFV determination. That is, as noted above, an affirmative preliminary LTFV determination carries with it the liability of duty assessment for all imports entering thereafter if a final affirmative dumping determination is made subsequently. Consequently, a preliminary finding of LTFV sales would be expected under this hypothesis to lead to a sharp drop in imports, with these trade-restricting effects lasting for the remainder of the investigation

4. There is a growing empirical literature concerned with the determinants and the duty and nonduty effects of antidumping law. See, e.g., Finger (1981), Hernander and Schwartz (1984), Salvatore (1987), Hartigan, Kamma, and Perry (1989), Messerlin (1989, 1990), Lichtenberg and Tan (1990), Harrison (1991), Prusa (1991), and Staiger and Wolak (1994a, 1994b). The two papers closest in spirit to our work here and in Staiger and Wolak (1994a) are Lichtenberg and Tan (1990) and Harrison (1991). However, unlike the present paper, neither Lichtenberg and Tan nor Harrison attempts to distinguish among the phases of the investigation process, nor does either paper attempt to account exhaustively for the various postinvestigation outcomes. Also, neither paper attempts to explore the possibility that the use and effects of antidumping law are source-country specific. See Staiger and Wolak (1994a) for a more detailed comparison of our work with these papers.

period, as long as the petition was perceived as having a reasonable chance of ending in a final dumping determination. In fact, this kind of investigation effect figures prominently in many press accounts of ongoing antidumping actions. For example, in reference to a U.S. antidumping petition brought by the National Knitwear and Sportswear Association against sweater producers in Hong Kong, South Korea, and Taiwan, the *New York Times* (1990) observes: "The [preliminary dumping] margins were announced as retailers are about to place orders for delivery next fall. Some industry officials said prospects of higher prices, or just the uncertainty over what the new price levels would be, could cause some retailers to switch to domestic suppliers."

In addition to a drop in imports coming with an affirmative preliminary LTFV determination, the outcome filer hypothesis carries with it two additional implications. First, in light of the possibility of an affirmative preliminary LTFV determination and subsequent falloff in import flows, imports might, if anything, be expected to rise somewhat during the first months of the investigation in anticipation of this effect. In fact, evidently anticipating this possibility, U.S. law provides for an assessment of "critical circumstances" under which duties can be imposed retroactively to the date of filing if the filing of a petition brings with it a significant import surge. For this reason, we would expect any import increase associated with the early stages of an investigation under the outcome filer hypothesis to be small. Second, under the outcome filer hypothesis, any petitions filed without regard to measures important for the final dumping determination would be unlikely to exhibit strong investigation effects, since this hypothesis presumes a significant probability of a final dumping determination and consequent duty imposition. It is for this reason that we refer to this hypothesis as the outcome filer hypothesis: the strength of the investigation effect under this hypothesis reflects the fear of retroactive duty imposition in the event of an affirmative final determination at the end of the investigation process and therefore ought to reflect the likelihood that the final outcome will be a finding of dumping.

It is also possible that there are investigation effects that do *not* reflect a significant probability of retroactive duty imposition at the end of the investigation process but reflect rather the effects of the investigation process itself. This embodies the process filer hypothesis. In an earlier paper (Staiger and Wolak 1991), we presented a model in which domestic firms make strategic use of the ongoing antidumping investigation of the pricing and sales practices of foreign firms to prevent the occurrence of price wars which might otherwise be triggered by periods of slack demand and low capacity utilization. Our theory suggests that domestic firms may value the competition-dampening effects of an ongoing antidumping investigation for its own sake and may file such petitions when capacity utilization is low with no expectation that they would actually result in duties or other remedies.

Specifically, we showed in Staiger and Wolak (1991) how access to antidumping law in the domestic country can lead to the filing of antidumping

petitions by the domestic industry when capacity utilization is sufficiently low, and to less aggressive pricing by foreign firms and greater market share for domestic firms—and in fact to a fall in imports and a rise in domestic output—during the period of investigation as a result. This occurs despite the fact that antidumping duties are never actually imposed and were never expected to be imposed. That is, the entire investigation effect of antidumping law under this interpretation comes in the form of a threat to "punish" foreign firms with a duty if they should "misbehave" and price too aggressively. Such a threat is made credible by filing the petition; because it is credible, the threatened duties need never materialize. In Staiger and Wolak (1994a), we referred to such filers as process filers and noted that (1) the act of filing ought to have an immediate trade-dampening effect which lasts for the duration of the investigation, distinguishing the investigation effects under process filers from those under outcome filers, and (2) process filers ought to file antidumping petitions on the basis of low capacity utilization and little else, and in particular should not be concerned with measures important for the final determination of dumping, thus distinguishing the filing behavior of process filers from that of outcome filers.

Suspension Effect

Turning to the suspension effect, a second way in which antidumping law may restrict trade through nonduty channels is through the effects of "suspension agreements," under which antidumping investigations are suspended by the Commerce Department in exchange for an explicit agreement by foreign firms named in the antidumping petition to eliminate sales in the U.S. market at less than "fair value." Since the intent of a suspension agreement is to provide a nonduty alternative by which previous dumping activities can be halted, it would be surprising if there were not a suspension effect in the data. A prominent example involving such a suspension agreement (though not falling in our sample period) was the 1986 U.S.-Japan Semiconductor Trade Arrangement.

Withdrawal Effect

Finally, a third way in which antidumping law may restrict trade through nonduty channels concerns the withdrawal effect.[5] That is, the imposition of antidumping duties or the negotiation of a suspension agreement need not be the only outcomes of an antidumping petition for which postinvestigation relief from imports is secured. In this regard, Prusa (1992) has argued that petitions which are withdrawn by the domestic industry before a final determination can have as restrictive an impact on subsequent trade flows as would be the case if a final determination of dumping had been made and duties imposed.

5. In addition, a number of papers, e.g., Anderson (1992), Staiger and Wolak (1992), and Prusa (1988), have suggested that the mere existence of antidumping law can have trade effects even in periods when no petition is filed.

Essentially, Prusa argues that domestic firms can use the threat of antidumping duties, together with the protection from domestic antitrust laws afforded when an antidumping proceeding is in progress, to bargain with foreign firms over domestic market share, and that the antidumping petition is withdrawn by the domestic industry if and when a sufficiently attractive bargain is struck.[6]

8.2.2 The Targets of Process Filers

Focusing on the three nonduty effects described above, together with the duty effect of antidumping law, in Staiger and Wolak (1994a) we found evidence of substantial investigation effects, and of the trade restrictiveness of suspension agreements, but found no evidence that withdrawn petitions had lasting trade-restricting effects. We also found some evidence for the coexistence of outcome and process filers in our data. However, we did not allow the filing strategy pursued by a domestic industry to differ by the identity of the country whose firms were named in the petition. Nor did we allow the trade effects of these petitions to vary systematically with the identity of the country against whose firms the petition was filed. In the next section we will present an extended framework which allows us to detect differences in filing strategies and in the impacts of antidumping law across the target countries named in the petition. However, before doing this we discuss why certain countries may be more likely targets of the process filing strategy than others.

The logic of our process filing strategy is that domestic firms use the antidumping investigation process to reduce the temptation of foreign firms to cut prices during periods of low capacity utilization. For this strategy to be sensible for domestic firms to pursue over our sample period, several conditions must be met in the country (countries) against which this filing strategy is being used. First, the firms exporting from each country named in the antidumping petition should account for a significant share of the relevant U.S. market, since otherwise the threat posed by these firms to the profitability of U.S. firms in the event of a breakdown in price discipline is likely to be small. Second, the U.S. market share captured by the firms exporting from these countries should be relatively stable over the sample period, since otherwise the premise of an orderly pricing arrangement, whose breakdown during periods of falling capacity utilization can be avoided through the competition-dampening effects of antidumping investigations, would be in doubt. Third, exporters from these countries should be relatively dependent on the U.S. market for their sales, since otherwise demand shifts in the U.S. market which lead to falling capacity utilization of U.S. firms might not lead to a significant fall

6. Agreements between foreign firms and domestic petitioners are permitted under the Noerr-Pennington doctrine which provides exemption from prosecution under U.S. antitrust law. Direct conversations between domestic and foreign firms concerning prices or quantities would not be protected, so settlements are typically negotiated through the Commerce Department (Horlick 1989). See Prusa (1992) for a detailed analysis of this exemption and its implications for the effects of antidumping law.

in capacity utilization rates for the foreign exporters (and therefore would not give rise to a significant temptation on the part of foreign exporters to cut prices in the U.S. market).

With these three criteria in mind, we note first that the five largest non–oil-exporting trading partners of the United States in 1980 by import values were Canada (16 percent of total U.S. imports), Japan (13 percent of total U.S. imports), Mexico (5 percent of total U.S. imports), Germany (5 percent of total U.S. imports), and the United Kingdom (4 percent of total U.S. imports), with a number of countries then clustered, each at just under 2 percent of total U.S. imports (International Monetary Fund 1987). Of these five biggest import-source countries for the United States, the growth in U.S. imports from Japan over the 1980–85 period was three times the growth in total U.S. imports over this period, and nearly twice as fast as the growth in U.S. imports over this period from the country with the next fastest import growth (Germany). Of the remaining four countries with high and relatively stable shares of the U.S. market over this period, 65 percent of Mexico's worldwide exports went to the U.S. market in 1980 and 61 percent of Canada's exports did, while the United Kingdom and Germany exported 10 and 6 percent of their worldwide exports, respectively, to the U.S. market (Japan exported 24 percent of its worldwide exports to the U.S. market). On this basis, we expect that Canada and Mexico would be the most likely targets of process filings from U.S. firms over our sample period because they represent two countries whose export production over this period is predominantly destined for the U.S. market and accounts for a relatively large and stable U.S. market share.

8.3 The Uses and Impacts of Antidumping Law

To investigate whether the filing strategies pursued by domestic firms and the impacts of the ensuing investigation process on the flow of imports and domestic output vary systematically with the identity of the country whose firms are named in the petition, we must first describe our choice of regional groupings and the data sources used for all of the empirical work presented in this paper. We then describe our econometric framework, which extends that of Staiger and Wolak (1994a). Finally, we estimate a model of industry-level antidumping suit filings and of the import and output effects associated with the various phases and potential outcomes of the investigation process. We assess the degree to which our findings differ systematically as a function of the identity of the countries whose firms are targeted by the investigation.

8.3.1 Regional Groupings

To select the different exporting regions used in our analysis we attempted to balance several concerns. On the one hand, we had to keep the number of regions from getting too large, lest the estimation of the model become unmanageable. But at the same time, we also felt that similar economies

should be grouped together. We settled on five regions: Canada and Mexico, as the region representing the most likely target of process filings, and four other regions. Our desire to group similar economies together led us to put all of the planned economies of Eastern Europe along with the former Soviet Union together as a single exporting region. We call this region the planned economy region. This desire also led us to group together all of the countries of Western Europe. In those cases in which we did not have a sufficient number of filings from a single country we grouped countries according to their location. This led us to group Japan in with the NICs of South Korea, Taiwan, Singapore, and Hong Kong. Our fifth region is a residual of all of the other countries. Further disaggregation of this region into smaller regions along geographic lines did not lead to statistically significantly different results for these subregions, so we retained this level of aggregation.

8.3.2 Data Sources

The source of data for the industry-level economic magnitudes is the National Bureau of Economic Research *Trade Data File* (see Abowd 1990 for a detailed description of this data set). This data set contains annual data for the period 1958–85 on the value of domestic shipments, imports, and exports for 450 U.S. manufacturing industries by four-digit 1972 Standard Industry Code (SIC). It also contains information on such industry-level economic aggregates as the level of employment and the size of the capital stock, as well as an industry-level output price deflator. The source for the filing dates for all antidumping petitions and the dates and outcomes of all the subsequent stages of the investigation process, as well as the identity of the countries whose firms are named in the investigation, is the National Technical Information Service's *Trade Action Monitoring System (TAMS) Pending Investigation Report.* This publication is produced by the Commerce Department on a monthly basis and tracks all petitions having to do with the 1974 Trade Act, such as petitions for escape clause relief, antidumping duties, countervailing duties, and remedies for unfair practices in import trade. Each month it lists the current disposition of each petition until its final determination. When an antidumping petition is filed, the petition must allege dumping of specific imported products. For purposes of the investigation, the ITC must then link the products under investigation to product codes of the *Tariff Schedules of the United States* (TSUS). Consequently, the TAMS data set records for each petition the TSUS codes for the products which are allegedly being dumped, the country or countries from which these imports came, and the petition's disposition in the current month.

We explicitly account for filing at the TSUS product code level in our econometric model of the suit-filing process and in our model of the impacts of antidumping suits on imports and domestic output flows. However, since our economic data is available at the four-digit 1972 SIC industry level, we must have a concordance between the TSUS codes and the four-digit 1972 SICs to assign antidumping suits to SIC industries. We obtain a year-by-year concor-

dance between TSUS product codes and the four-digit 1972 SIC codes from the Commerce Department's Foreign Trade Division's *Imports Extract Master Concordance*. This concordance allows us to assign each TSUS product covered by an antidumping petition to a four-digit SIC industry. Because TSUS codes are based on traded products and SIC code assignments are based on a firm's principal productive activities, several SIC industries do not have any TSUS code associated with them over our sample. Consequently, a necessary requirement for an SIC industry to appear in our data set is that it contains at least one TSUS code product for each year during our sample. Only four industries were deleted from the sample because they had no TSUS code in them for only a portion of the sample time period. Most of the industries omitted had no TSUS codes in them for all years. This concordance procedure left a total of 338 industries for our time period of 1980–85.

Our empirical work focuses on 1980–85 because significant changes in the structure of U.S. antidumping law were made in the Trade Agreement Act of 1979. Modifications of this act were made by the Trade and Tariff Act of 1984, but none of these are directly relevant to the issues we consider in our research.

8.3.3 Econometric Model

There are several aspects of the economic environment we are modeling that our econometric model should capture. These involve the joint determination of the decision to file a petition with the level of imports and domestic output in an industry, as well as a number of specific characteristics of the petition-filing process and of the impacts of filings on the level of imports and domestic output. We begin with a brief discussion of these modeling issues and then present the econometric model which we estimate.

First, the decision to file an antidumping petition is likely to be determined jointly with the level of imports and domestic output in the industry. As such, filing, import, and output equations should be estimated jointly, allowing for the possibility of various correlations across equations. We allow for contemporaneous correlation between the level of imports and domestic output and the decision to file an antidumping suit against any of our five importing regions by the presence of an unobservable industry characteristic which affects the conditional mean of each of these variables. Our econometric model also allows for the existence of contemporaneous correlations among imports, domestic output, and the filing rates, as well as correlations over time among these seven variables.

Second, in attempting to understand the filing strategies used by firms, and to ask whether these strategies differ systematically with the identity of the countries whose firms are targeted by the petitions, there are several characteristics which we need to capture in our econometric model. Of primary importance is the fact, as mentioned above, that antidumping suits are filed at the TSUS code level although all of our economic data is at the four-digit SIC level. Consequently, we must construct a model which allows us to recover

information about the TSUS-level filing process using SIC-level economic data as regressors for the filing rate process. The number of filings in a given TSUS code is a nonnegative discrete-valued random variable that is zero for most time periods, but in the periods in which it is nonzero, it can take on large values. We select a discrete distribution for the TSUS-level number of antidumping suit filings which allows for this "contagion" property. In addition, to match the industry-level aggregation of our import and domestic output data, we need a distribution for TSUS-level filings which can be aggregated to the four-digit SIC level in a straightforward manner.

Third, to measure the impacts of various stages of the antidumping investigation process on the flow of imports and domestic output, and to ask whether these impacts differ systematically with the identity of the countries involved, several characteristics of the investigation process must be accounted for. First, a single antidumping investigation can straddle more than a single year, while each of the various stages of the process last only a fraction of a year. In addition, at the level of multilateral imports several antidumping investigations or outcomes can be simultaneously active in a single TSUS code because of filings against the same product imported from different countries. These characteristics present a problem because, as mentioned above, our data on imports and domestic output are only available on an annual basis at the four-digit SIC level and our import data is not broken down by source country. Consequently, we must specify a model which will allow us to recover the TSUS-level impacts on the flows of imports and on domestic output from stages of the investigation process which may run over adjacent years or for a fraction of a year, accounting for the possibility of multiple filings from the same TSUS code, using data which is time aggregated to annual magnitudes and cross-sectionally aggregated to the four-digit SIC industry level, and with import data which is only available at a multilateral level. Our TSUS-level, within-year flow model provides a framework for us to recover within-year country-specific effects from annual multilateral import and domestic output levels using indexes of country-specific suit activity in that year.

Our SIC-level model of the filing rate process and the impacts of the investigation process can be interpreted without reference to the underlying TSUS-level processes. However, our bottom-up approach, starting with a TSUS-level model which has not been time aggregated to the annual magnitudes nor aggregated across country to multilateral magnitudes, specifies an econometric model at the level of time, country, and product aggregation at which the true underlying processes are occurring. It is then aggregated across time, product, and country to an industry-level model. This modeling strategy allows the recovery of both TSUS- and industry-level impacts because the industry-level model is obtained from the explicit aggregation of the TSUS-level model. In addition, the strategy makes explicit the restrictions imposed on the TSUS-level and region-level models which are implied by estimating an industry-level model.

We now describe the details of our econometric model of suit-filing behavior and its impacts on the level of imports and domestic output. Let f_{grit} be the number of antidumping suits filed in industry i against good g from region r in period t, where $g = 1, \ldots, G_{it}$, $t = 1, \ldots, T$, $r = 1, \ldots, R$, and $i = 1, \ldots, N$. In the present case $R = 5$, $T = 6$, and $N = 338$. Because antidumping suits are filed at the TSUS code level, for the purposes of this paper a good is defined to be a TSUS product code.

Let λ_{grit} denote the rate at which suits are filed in industry i against good g from region r in period t. We assume that the distribution of f_{grit} given λ_{grit} is Poisson ($\mathbf{P}(\lambda)$) with parameter $\lambda = \lambda_{grit}$. We denote this fact using the notation

$$f_{grit} \mid \lambda_{grit} \sim P(\lambda_{grit}). \tag{1}$$

These assumptions are consistent with f_{grit} being a Poisson point process for the time interval t to $t + 1$, which we will call time period t.

We further assume that λ_{grit} possesses a gamma distribution $\Gamma(\mu_{rit}, \sigma_r)$, where $\mu_{rit} = \exp(X_{it}'\gamma_r + \delta_r\theta_i)$. The vector X_{it} contains the observable characteristics of industry i as of the beginning of time t which affect its filing rate; the vector γ_r and the scalars σ_r and δ_r are parameters to be estimated.[7] The variable θ_i is the unobservable characteristic of industry i which affects the mean filing rate for that industry, and δ_r is the parameter which denotes the impact θ_i has on the filing rate against region r. We assume that θ_i is independently and identically distributed across industries and remains constant over time. Using our above notation we have

$$\lambda_{grit} \mid \{X_{it}, \theta_i\} \sim \Gamma(\exp(X_{it}'\gamma_r + \delta_r\theta_i), \sigma_r). \tag{2}$$

Assumption (2) implies that each product class from region r within industry i and in time period t has a different mean rate of filing (λ_{grit}), although all of these filing rates are drawn from the same gamma distribution.

Combining assumptions (1) and (2), we have

$$f_{grit} \mid \{X_{it}, \theta_i\} \sim P(\lambda_{grit}) \bigcirc_{\lambda_{grit}} \Gamma(\exp(X_{it}'\gamma_r + \delta_r\theta_i), \sigma_r), \tag{3}$$

where $\bigcirc_{\lambda_{grit}}$ denotes compounding or mixing the parameter λ_{grit} of the Poisson distribution with a gamma distribution $\Gamma(\exp(X_{it}'\gamma_r + \delta_r\theta_i), \sigma_r)$. Results from Johnson and Kotz (1969, chap. 5) imply that f_{grit} has a negative binomial distribution with parameters σ_r and $\mu_{rit} = \exp(X_{it}'\gamma_r + \delta_r\theta_i)$. We abbreviate this as $f_{grit} \sim \mathrm{NB}(\sigma_r, \mu_{rit})$. This discrete density takes the following form:

$$\mathrm{pr}[f_{grit} = k] = \binom{\sigma_r + k - 1}{\sigma_r - 1}(\mu_{rit}^f)^k(1 + \mu_{rit}^f)^{-(\sigma_r + k)}. \tag{4}$$

The mean of f_{grit} is $\sigma_r\mu_{rit}$. We assume that conditional on θ_i, f_{grit} is independent of f_{hqjs} so long as any one of the four subscript indexes differ.

7. In Staiger and Wolak (1994a), we constrained all r-subscripted variables to be equal across all regions.

Our data generation process captures the following logic. In each period t, λ_{grit}, the filing rate against product class g imported from region r in industry i, is drawn from a $\Gamma(\exp(X_{it}'\gamma_r + \delta_r\theta_i), \sigma_r)$ distribution. Conditional on this draw of λ_{grit} and the value of θ_i, the actual filing behavior against an individual product class from region r evolves according to a Poisson process with rate λ_{grit}. For each regional import source, this compound distribution model allows for differences in filing rates across product classes within an industry. At the same time, for each regional import source, the model imposes the restriction that the filing rates against imports for all product classes within an industry have the same expectation. From our estimation procedure we can recover estimates of the parameters of both the distribution $\Gamma(\exp(X_{it}'\gamma_r + \delta_r\theta_i), \sigma_r)$ and the filing Poisson process conditional on the realized value of λ_{grit}.

The filing of an antidumping suit is a rare event, but when it occurs there tends to be clustering in the number of filings. Within the context of our econometric model we can think of this clustering of suits as caused by the positive skewness in the gamma distribution for λ_{grit}, so that most realizations of the rate of the Poisson process are very small. However, a large realization occurs very rarely, which in turn implies a large number of observed filings. In addition, the unobserved heterogeneity across industries represented by θ_i allows for a much larger (or smaller) level of filing activity from a given industry than is predicted by its observable characteristics. Both the stochastic nature of the mean filing rate and the impact of unobservable industry-level heterogeneity θ_i on the filing rate allow for a substantial amount of variability in the TSUS-level filing rates across industries.

To compute f_{rit}, the total number of suits filed within industry i against region r during period t, we sum f_{grit} from $g = 1$ to G_{it}, the total number of TSUS product codes within industry i in period t. This summation yields

$$f_{rit} = \sum_{g=1}^{G_{it}} f_{grit}. \tag{5}$$

This industry-level annual amount of filing activity against region r is the observable dependent variable used to estimate the parameters γ_r and σ_r and the across-industry distribution of heterogeneity $f(\theta)$.

To construct the conditional density of f_{rit} given θ_i, we utilize the fact that the sum of two independent NB(α, β) random variables is NB(2α, β). This implies that f_{rit} possesses a negative binomial distribution with parameters $G_{it}\sigma_r$ and $\mu_{rit} = \exp(X_{it}'\gamma_r + \delta_r\theta_i)$, conditional on the value of θ_i. Consequently, the conditional distribution of f_{rit} given θ_i is

$$\begin{aligned} \text{pr}[f_{rit} \mid \theta_i] = {} & \frac{\Gamma(G_{it}\sigma_r + f_{rit})}{\Gamma(f_{rit} + 1)\,\Gamma(G_{it}\sigma_r)} \exp(f_{rit}(X_{it}'\gamma_r + \delta_r\theta_i)) \\ & \times (1 + \exp(X_{it}'\gamma_r + \delta_r\theta_i))^{-(G_{it}\sigma_r + f_{rit})}, \end{aligned} \tag{6}$$

where $\Gamma(\alpha)$ is the gamma function

$$\Gamma(\alpha) = \int_0^{\infty} t^{\alpha - 1} e^{-t}\, dt.$$

We have also made use of the relationship $\Gamma(\alpha + 1) = \alpha!$. The joint density function of $f_i = (f_{1i}, f_{2i}, \ldots, f_{Ri})$, where $f_{ri} = (f_{1980,i}, f_{1981,i}, \ldots, f_{1985,i})'$, is

$$\text{pr}[f_i \mid \theta_i] = \prod_{r=1}^{R} \prod_{t=1980}^{1985} \text{pr}[f_{rit} \mid \theta_i], \tag{7}$$

where $\text{pr}[f_{rit} \mid \theta_i]$ is defined in equation (6). Henceforth let $t = 1, \ldots, T = 6$ denote the years 1980–85. The structure of equation (7) accounts for several aspects of our underlying data generation process. First, it allows for contemporaneous correlation across regions in the filing rates for a given industry. Second, it allows for correlation over time in filing rates both for a given region and across regions. Finally, it accounts for the discrete, nonnegative support and extreme positive skewness in the density of filings for each region.

We now turn to our model of the impact of antidumping investigation activity and outcomes on industry-level imports and output which is linked to the model of filing activity through the unobserved industry heterogeneity θ_i. As discussed above, because we are attempting to measure the within-year effects of the stages and various outcomes of the antidumping investigation process from annual magnitudes, we first specify a model for the rate of imports of product class g in industry i from region j within any given year t which incorporates how each of the stages and outcomes of the investigation process affects this rate. We then aggregate this regional import rate equation over regions to obtain the (multilateral) import rate equation. Specifying an analogous equation for the rate of domestic output, we then aggregate these two within-year flow equations to obtain the annual level of imports and domestic output by product class. This aggregation process produces indexes of annual suit activity consistent with our model of import and domestic output flows. Aggregating these TSUS-level annual-level equations over all products in each four-digit SIC industry yields industry-level equations which can be estimated using our industry-level data.

Specifically, let IMP_{gjit} denote the level of imports from region j for product class g in industry i in time period t. Let OUT_{git} denote the level of output produced domestically in product class g in industry i in time period t.

Our within-year model of the impacts of suit activity assumes that for any year t and industry i, the following linear differential equations characterize the instantaneous annual rate of change in the quantity of imports from region j and domestic output at the TSUS code level:

$$\frac{d\text{IMP}_{gjit}}{ds} = \beta_j^m \theta_i + \xi_{jt}^m + \sum_r \sum_k \beta_{jrk}^m I_{grit}^k(s) + e_{gjit}(m), \tag{8r}$$

$$\frac{d\text{OUT}_{git}}{ds} = \beta^o\theta_i + \xi_t^o + \sum_r\sum_k \beta_{rk}^o I_{grit}^k(s) + e_{git}(o), \tag{9}$$

where β_j^m and β^o are coefficients quantifying the impact of the unobservable industry heterogeneity on the rate of change of imports from region j and industry i and of output in industry i for all time, ξ_{jt}^m and ξ_t^o are fixed time effects for the two rates of change for year t, and $\sum_z$ denotes a summation over the range of the index z. The count variables $I_{grit}^k(s)$ (k = OGP, OGPLFV, OGSUS, OGWD, and OGD) count, respectively, the number of currently ongoing antidumping petitions (OGP), ongoing affirmative preliminary LTFV determinations (OGPLFV), ongoing suspension agreements (OGSUS), ongoing withdrawn petitions (OGWD), and ongoing antidumping duties (OGD) for all $s \in [t, t+1)$ against product class g from region r in industry i and time period t. Hence, equation (8r) allows for the possibility that suit activity k against region r can affect import flows from region j (as measured by β_{jrk}^m). The variables $e_{gjit}(m)$ and $e_{git}(o)$ are independent identically distributed shocks to the rate of imports from region r and output for product class g in industry i during period t.

We now aggregate the regional import rate equation (8r) over the $R = 5$ regions to obtain the (multilateral) import rate equation (8) analogous to the output rate equation (9):

$$\frac{d\text{IMP}_{git}}{ds} = \beta^m\theta_i + \xi_t^m + \sum_r\sum_k \beta_{rk}^m I_{grit}^k(s) + e_{git}(m)\,, \tag{8}$$

where $\text{IMP}_{git} = \sum_j \text{IMP}_{gjit}$, $\beta^m = \sum_j \beta_j^m$, $\xi_t^m = \sum_j \xi_{jt}^m$, $\beta_{rk}^m = \sum_j \beta_{jrk}^m$, and $e_{git}(m) = \sum_j e_{gjit}(m)$. The coefficients β_{rk}^l, ($l = o, m$) quantify the impact of a one-unit change in region r's count variables $I_{grit}^k(s)$ on the annual rate of (multilateral) imports and domestic output for good g in industry i during time period t. We assume that the disturbance vector $e_{git} = (e_{git}(m), e_{git}(o))'$ possesses a bivariate normal distribution with mean zero and covariance matrix Σ. We assume that e_{git} is independent and identically distributed across goods and industries and over time.

To clarify how the workings of antidumping law affect the quantity of imports and domestic output in our model, consider the following example. Suppose that no antidumping investigation or action is currently in effect on imports from product class g in industry i during year t. In this case the rate of imports in product class g in industry i is

$$\frac{d\text{IMP}_{git}}{ds} = \beta^m\theta_i + \xi_t^m + e_{git}(m). \tag{10}$$

Suppose now that an antidumping investigation is initiated some time during period t on imports in this product class from region r. The variable $I_{grit}^{\text{OGP}}(s)$ will then take on the value 1 for all $s \in [t, t+1)$ such that the antidumping investigation is currently active. Consequently, the rate of imports will increase by

the value of $\beta^m_{r,\mathrm{OGP}}$ because an investigation is currently ongoing against goods of that product class from region r. Should another petition be filed against imports within this product class from somewhere else in region r during the same time interval, then $I^{\mathrm{OGP}}_{grit}(s)$ will take on the value 2 for as long as both sets of investigations are ongoing; it will return to the value of 1 when a single investigation is again active, and 0 when no investigations are active. Each of the other count variables behaves in a similar manner.

Continuing with the derivation of our TSUS-level import and output equations, we integrate equations (8) and (9) with respect to s from t to $t + 1$ to obtain

$$\mathrm{IMP}_{git} = \beta^m\theta_i + \xi^m_t + \sum_r \sum_k \beta^m_{rk} k_{grit} + e_{git}(m), \tag{11}$$

$$\mathrm{OUT}_{git} = \beta^o\theta_i + \xi^o_t + \sum_r \sum_k \beta^o_{rk} k_{grit} + e_{git}(o), \tag{12}$$

where

$$k_{grit} = \int_t^{t+1} I^k_{grit}(s)\, ds.$$

In order to compute industry-level import and output equations from these product-level equations, we must aggregate over all of the product classes g within industry i in period t. Summing over all g yields

$$\mathrm{IMP}_{it} = \beta^m\theta_i G_{it} + \xi^m_t G_{it} + \sum_r \sum_k \beta^m_{rk} k_{rit} + \eta_{it}(m)\,, \tag{13}$$

$$\mathrm{OUT}_{it} = \beta^o\theta_i G_{it} + \xi^o_t G_{it} + \sum_r \sum_k \beta^o_{rk} k_{rit} + \eta_{it}(o)\,, \tag{14}$$

where

$$\mathrm{IMP}_{it} = \sum_{g=1}^{G_{it}} \mathrm{IMP}_{git}, \quad \mathrm{OUT}_{it} = \sum_{g=1}^{G_{it}} \mathrm{OUT}_{git}\,,$$

$$k_{rit} = \sum_{g=1}^{G_{it}} k_{grit}, \quad \eta_{it}(l) = \sum_{g=1}^{G_{it}} e_{git}(l),$$

for $l = m, o$. This aggregation procedure implies that $\eta_{it} = (\eta_{it}(m), \eta_{it}(o))'$ is $N(0, G_{it}\Sigma)$ so that η_{it} is heteroskedastic conditional on G_{it}. Dividing equations (13) and (14) by G_{it} yields a model more amenable to estimation. This form of the model is analogous to the conventional fixed time effects, random individual effects panel-data model. The model is

$$\mathrm{IMP}_{it}/G_{it} = \mu^m_{it} + \eta_{it}(m)/G_{it}, \quad \mathrm{OUT}_{it}/G_{it} = \mu^o_{it} + \eta_{it}(o)/G_{it}, \tag{15}$$

where

$$\mu^m_{it} = \beta^m\theta_i + \xi^m_t + \sum_r \sum_k \beta^m_{rk} k_{rit}/G_{it}, \tag{16}$$

$$\mu_{it}^{o} = \beta^{o}\theta_i + \xi_t^{o} + \sum_r \sum_k \beta_{rk}^{o} k_{rit}/G_{it}.$$

The variables μ_{it}^{m} and μ_{it}^{o} are the conditional means of the normalized annual imports and output from industry i in period t. Each of the normalized count variables now can be interpreted as a measure of the intensity of suit activity. The normalized error vector η_{it}/G_{it} is still heteroskedastic because of the distribution for η_{it} given above. Consequently, we apply the appropriate weighting scheme in the construction of the likelihood function.

Using our distributional assumptions we can construct the joint density of $\text{IMP}_i^* = (\text{IMP}_{i1}/G_{i1}, \ldots, \text{IMP}_{iT}/G_{iT})'$ and $\text{OUT}_i^* = (\text{OUT}_{i1}/G_{i1}, \ldots, \text{OUT}_{iT}/G_{iT})'$ conditional on θ_i as follows. Conditional on the value of θ_i, the joint density of the two-dimensional vector $(\text{IMP}_{it}/G_{it}, \text{OUT}_{it}/G_{it})'$ is

$$\phi(\text{IMP}_{it}/G_{it}, \text{OUT}_{it}/G_{it} \mid \theta_i) = \frac{1}{2\pi} \mid G_{it}^{-1}\Sigma \mid^{-1/2} \exp\left(-1/2(\nu_{it}'(G_{it}^{-1}\Sigma)^{-1}\nu_{it})\right), \tag{17}$$

where $\nu_{it} = ((\text{IMP}_{it}/G_{it} - \mu_{it}^{m}), (\text{OUT}_{it}/G_{it} - \mu_{it}^{o}))'$. This implies that the joint density of $(\text{IMP}_i^*, \text{OUT}_i^*)'$ conditional on θ_i is

$$h(\text{IMP}_i^*, \text{OUT}_i^* \mid \theta_i) = \prod_{t=1}^{T} \phi(\text{IMP}_{it}/G_{it}, \text{OUT}_{it}/G_{it} \mid \theta_i). \tag{18}$$

Combining this joint density with the joint density of regional filings over the sample period yields the following joint density of filings against the five regions, output, and imports over our sample period conditional on θ_i:

$$g(f_i, \text{IMP}_i^*, \text{OUT}_i^* \mid \theta_i) = h(\text{IMP}_i^*, \text{OUT}_i^* \mid \theta_i)\ \text{pr}(f_i \mid \theta_i). \tag{19}$$

To complete the construction of the unconditional joint density of filings, output, and imports over our sample period for any industry we must integrate this conditional density with respect to the density of θ. We choose a discrete factor approximation to this unknown density. Recent Monte Carlo work by Mroz and Guilkey (1991) has found these discrete factor structures are able to model a wide variety of potential unobserved heterogeneity distributions. For many models involving discrete and continuous endogenous variables, the parameters of the conditional distribution of interest estimated from these models were found to dominate those obtained from the maximum likelihood estimator in terms of mean squared error loss for sample sizes considered. Integrating with respect to this discrete density of θ, (π_h, θ_h) for $h = 1, \ldots, H$, where H is the number of points of support of the discrete density and π_h the probability associated with the point of support θ_h, yields

$$p(f_i, \text{IMP}_i^*, \text{OUT}_i^*) = \sum_{h=1}^{H} \pi_h g(f_i, \text{IMP}_i^*, \text{OUT}_i^* \mid \theta_h). \tag{20}$$

In our empirical work, we found that choosing $H = 3$ was sufficient to adequately estimate $f(\theta)$. We found that for larger values of H the parameters of the conditional mean function for the five filing variables and the imports and

domestic output equations did not change appreciably.[8] Taking the logarithm of $p(f_i, \text{IMP}_i^*, \text{OUT}_i^*)$ and summing from $i = 1$ to N yields the log-likelihood function for our model.

Before presenting the estimates of the parameters of the joint density of these seven variables we must first discuss the variables entering X_{it}, the vector of observable industry characteristics shifting the conditional mean of the filing rate of industry i and time period t. Because we wish to allow for the possibility that firms pursue the outcome filing strategy against some regions and the process filing strategy against others, we include in X_{it} variables suggested by both filing strategies. Note that the absence of an r subscript on the vector X_{it} reflects the restriction that regional filing rates do not depend on the characteristics of the regions. Our lack of data at the regional level necessitated this restriction.

Our main objective in selecting outcome filer variables for inclusion in X_{it} follows from the logic that if a variable is used to determine injury in an antidumping suit proceeding and industries are aware of this, then these variables should be predictors of future dumping suit activity (under the outcome filing strategy). Although the domestic industry must concern itself with the establishment of injury, a LTFV determination is also necessary for dumping to be found. Moreover, the margin by which the Commerce Department finds that final sales to the domestic market are made at less than fair value determines the magnitude of the antidumping duties that the petitioning industry can expect. Nevertheless, the Commerce Department's final LTFV margin is extremely unpredictable, and there are biases inherent in the process used to determine its level which favor finding a positive margin.[9] For these reasons, we hypothesize that firms pursuing the outcome filing strategy file primarily based on the observable industry characteristics that determine injury and allow for a sufficiently rich stochastic structure for our model to account for unobservable differences in filing behavior across industries.

A major indicator of injury to the petitioning firms is the import penetration ratio $\text{IMPEN}_{it} = \text{IMP}_{it}/(\text{IMP}_{it} + \text{OUT}_{it})$. A large value of IMPEN is indicative of a large foreign presence in the domestic market, which may be injurious to the domestic firms. A second variable which is used to assess injury is the domestic firm's capacity utilization rate, which we represent at the industry level by $\text{CAPU}_{it} = \text{OUT}_{it}/\text{CAP}_{it}$ (where OUT_{it} is real shipments and CAP_{it} is real capital stock). We compute OUT_{it} as the nominal value of annual ship-

8. This result is consistent with the Monte Carlo evidence in Mroz and Guilkey (1991), who found small values of H were sufficient to adequately capture variability due to θ.

9. This uncertainty is due in part to the different methodologies, sometimes for a single suit, that can be used to determine this margin. Boltuck and Litan (1991) contains several papers which discuss the large amount of uncertainty inherent in the dumping margin determination process. In addition, a conclusion which is fairly consistent throughout most of the papers in this volume is that there are strong biases in the process toward finding a positive dumping margin. The papers by Francois, by Palmeter, by Anspacher, and by Boltuck, Francois, and Kaplan in the Boltuck and Litan (1991) volume are particularly persuasive in this regard.

ments divided by the industry-specific shipments price index. All real magnitudes are in 1972 dollars. We include $IMPEN_{i,t-1}$ and $CAPU_{i,t-1}$ in X_{it} because they are both predetermined as of the beginning of year t. We also include time fixed effects in X_{it} to account for any trends in filing activity not accounted for by changes in observable or unobservable industry characteristics.

We also include several additional variables to account for the fact that the magnitude of IMPEN and CAPU necessary to find harmful dumping may vary with the size and the structure of the domestic industry. We measure the size of an industry by EMP_{it}, aggregate employment for industry i in period t, and expect that a given level of IMPEN and CAPU is more likely to be associated with a finding of injury the larger the size of the industry. We attempt to proxy for the (vertical) structure of an industry by value added per dollar of output in the industry, $VADD_{it}/OUT_{it}$, and expect that a given level of IMPEN and CAPU is more likely to be associated with a finding of injury to the domestic industry the lower is VADD/OUT, that is, the farther downstream the domestic industry is located and thus the smaller the share of primary factor payments in total industry cost and the more sensitive those factor payments will be to industry price changes. The final control variable we include is the percentage of all workers in the industry that are unionized, UNION. We hypothesize that this variable captures the ability of the industry to organize and file antidumping petitions against foreign competitors. Because these variables are predetermined at the beginning of year t, lagged values of VADD/OUT, EMP, and UNION (their values for period $t - 1$) are included in X_{it}.

As we have noted above, under the process filing strategy we would expect filing to be related to CAPU and little else and, in particular, not to be related to other measures important for the final determination of dumping (IMPEN, EMP, and VADD/OUT). As with outcome filing, we also hypothesize that UNION captures the ability of the industry to organize and file antidumping petitions against foreign competitors under the process filing strategy.

Table 8.1 contains the sample means and standard errors for all of the variables used in our analysis. The most striking aspect of the table is the large standard deviation of all filing and suit resolution process variables. In addition, the sample skewness of these variables is also very large and positive. These properties are indicative of the extreme rare event nature of antidumping suit activity and underscore the importance of specifying a statistical model which accounts for these characteristics of the economic environment. As mentioned above, all dollar magnitudes are in real 1972 dollars.

8.3.4 Results

Tables 8.2–8.6 present estimates of the parameters of the filing rate equation for our five importing regions. We first will discuss these results and then turn to a discussion of our import and output equations.

To interpret the results in tables 8.2–8.6, recall that under our assumptions

Table 8.1 **Means and Standard Errors of Variables: 2040 Year-Industry Observations ($i = 1, \ldots, N = 338$ industries and $t = 1, \ldots, T = 6$ years)**

Variable	Definition	Mean	Standard Error
f_{it}^{Japan}	Total filings from Japan and NICs	0.231	2.454
f_{it}^{Europe}	Total filings from Europe	0.249	4.021
f_{it}^{Planned}	Total filings from planned economies	0.078	1.694
f_{it}^{CANMEX}	Total filings from Canada or Mexico	0.062	1.455
f_{it}^{Other}	Total filings from other countries	0.280	6.157
G_{it}	Total TSUS codes	33.63	131.86
IMP_{it}	Real imports in 10^6 1972 dollars	289.55	1147.98
OUT_{it}	Real output in 10^6 1972 dollars	2174.03	4152.99
$\text{EMP}_{i,t-1}$	Industry-level employment $\times 10^3$	41.97	62.37
$\text{VADD}_{i,t-1}/\text{OUT}_{i,t-1}$	Value added per dollar of real output	0.483	0.133
$\text{CAPU}_{i,t-1}$	Capacity utilization rate	2.856	1.929
$\text{IMPEN}_{i,t-1}$	Import penetration ratio	0.109	0.140
$\text{UNION}_{i,t-1}$	Percentage of workers unionized	12.25	28.98
$\text{OGP}_{it}^{\text{Japan}}$	Ongoing antidumping petition against Japan and NICs	0.164	1.649
$\text{OGPLFV}_{it}^{\text{Japan}}$	Ongoing preliminary LTFV determination against Japan and NICs	0.055	0.603
$\text{OGSUS}_{it}^{\text{Japan}}$	Ongoing suspension against Japan and NICs	0.00[a]	0.00[a]
$\text{OGWD}_{it}^{\text{Japan}}$	Ongoing withdrawal against Japan NICs	0.020	0.595
$\text{OGD}_{it}^{\text{Japan}}$	Ongoing duties against Japan and NICs	0.170	2.231
$\text{OGP}_{it}^{\text{Europe}}$	Ongoing antidumping petition against Europe	0.131	2.238
$\text{OGPLFV}_{it}^{\text{Europe}}$	Ongoing preliminary LTFV determination against Europe	0.033	0.871
$\text{OGSUS}_{it}^{\text{Europe}}$	Ongoing suspension against Europe	0.065	1.488
$\text{OGWD}_{it}^{\text{Europe}}$	Ongoing withdrawal against Europe	0.354	6.971

(continued)

Table 8.1 (continued)

Variable	Definition	Mean	Standard Error
OGD_{it}^{Europe}	Ongoing duties against Europe	0.065	1.347
$OGP_{it}^{Planned}$	Ongoing antidumping petition against planned economies	0.043	1.074
$OGPLFV_{it}^{Planned}$	Ongoing preliminary LTFV determination against planned economies	0.014	0.269
$OGSUS_{it}^{Planned}$	Ongoing suspension against planned economies	0.027	0.495
$OGWD_{it}^{Planned}$	Ongoing withdrawal against planned economies	0.017	0.773
$OGD_{it}^{Planned}$	Ongoing duties against planned economies	0.002	0.044
OGP_{it}^{CANMEX}	Ongoing antidumping petition against Canada or Mexico	0.038	0.997
$OGPLFV_{it}^{CANMEX}$	Ongoing preliminary LTFV determination against Canada or Mexico	0.012	0.412
$OGSUS_{it}^{CANMEX}$	Ongoing suspension against Canada or Mexico	0.003	0.077
$OGWD_{it}^{CANMEX}$	Ongoing withdrawal against Canada or Mexico	0.013	0.581
OGD_{it}^{CANMEX}	Ongoing duties against Canada or Mexico	0.008	0.277
OGP_{it}^{Other}	Ongoing antidumping petition against other	0.165	3.563
$OGPLFV_{it}^{Other}$	Ongoing preliminary LTFV determination against other	0.045	1.146
$OGSUS_{it}^{Other}$	Ongoing suspension against other	0.080	1.810
$OGWD_{it}^{Other}$	Ongoing withdrawal against other	0.149	4.178
OGD_{it}^{Other}	Ongoing duties against other	0.052	0.951

[a]No suspension agreements with Japan or the NICs were made during our sample time period.

Table 8.2 **Filing Rate Equation Estimates for Japan and NICs (N = 338 industries for T = 6 years)**

Variable	Coefficient Estimate	Standard Error
Constant	−2.807	1.153
$IMPEN_{i,t-1}$	5.523	1.580
$CAPU_{i,t-1}$	−0.188	0.121
$EMP_{i,t-1}$	0.0079	0.0024
$VADD_{i,t-1}/OUT_{i,t-1}$	1.165	2.335
$UNION_{i,t-1}$	0.061	0.018
$\sigma \times 10^4$	4.970	0.858
YEAR81	1.036	0.821
YEAR82	1.136	0.851
YEAR83	2.039	0.813
YEAR84	1.359	0.824
YEAR85	1.671	0.749

Note: NICs = Taiwan, Singapore, South Korea, and Hong Kong.

Table 8.3 **Filing Rate Equation Estimates for Western Europe (N = 338 industries for T = 6 years)**

Variable	Coefficient Estimate	Standard Error
Constant	−5.386	1.871
$IMPEN_{i,t-1}$	3.939	1.963
$CAPU_{i,t-1}$	−0.298	0.121
$EMP_{i,t-1}$	0.0028	0.0032
$VADD_{i,t-1}/OUT_{i,t-1}$	3.859	2.528
$UNION_{i,t-1}$	0.119	0.023
$\sigma \times 10^4$	6.023	1.185
YEAR81	−1.897	1.192
YEAR82	−0.819	0.937
YEAR83	2.229	0.796
YEAR84	0.431	0.815
YEAR85	1.759	0.786

Table 8.4 **Filing Rate Equation Estimates for Planned Economies of Eastern Europe (N = 338 industries for T = 6 years)**

Variable	Coefficient Estimate	Standard Error
Constant	−8.948	3.915
$IMPEN_{i,t-1}$	−5.572	5.948
$CAPU_{i,t-1}$	−0.280	0.345
$EMP_{i,t-1}$	0.0041	0.0072
$VADD_{i,t-1}/OUT_{i,t-1}$	4.515	5.406
$UNION_{i,t-1}$	0.203	0.060
$\sigma \times 10^4$	3.705	1.383
YEAR81	−1.993	1.705
YEAR82	−1.512	2.406
YEAR83	−2.998	2.700
YEAR84	0.387	1.856
YEAR85	2.447	1.716

Table 8.5 **Filing Rate Equation Estimates for Canada or Mexico (N = 338 industries for T = 6 years)**

Variable	Coefficient Estimate	Standard Error
Constant	−3.508	2.051
$IMPEN_{i,t-1}$	0.176	0.652
$CAPU_{i,t-1}$	−0.487	0.145
$EMP_{i,t-1}$	−0.0047	0.0032
$VADD_{i,t-1}/OUT_{i,t-1}$	1.824	2.510
$UNION_{i,t-1}$	0.142	0.029
$\sigma \times 10^4$	3.492	1.254
YEAR81	−3.335	0.643
YEAR82	−1.067	0.652
YEAR83	2.012	1.112
YEAR84	−1.028	0.580
YEAR85	−0.839	0.652

Table 8.6 **Filing Rate Equation Estimates for All Other Countries (N = 338 industries for T = 6 years)**

Variable	Coefficient Estimate	Standard Error
Constant	−1.991	2.216
$IMPEN_{i,t-1}$	−9.127	4.650
$CAPU_{i,t-1}$	−0.456	0.178
$EMP_{i,t-1}$	−0.0068	0.0052
$VADD_{i,t-1}/OUT_{i,t-1}$	−2.283	3.206
$UNION_{i,t-1}$	0.074	0.022
$\sigma \times 10^4$	5.132	1.324
YEAR81	−0.022	1.717
YEAR82	4.860	1.371
YEAR83	2.121	1.325
YEAR84	2.875	1.324
YEAR85	4.229	1.293

the mean of the filing rate against region r in industry i for period t is $E(f_{rit}) = \exp(X'_{it}\gamma_r + \delta_r\theta_i)\sigma_r$. Taking the natural logarithm of both sides of $E(f_{rit})$ yields

$$\ln[E(f_{rit})] = X'_{it}\gamma_r + \delta_r\theta_i + \ln(\sigma_r).$$

Consequently, each element of γ_r can be interpreted as the percentage increase in the mean number of filings against region r as a result of a one-unit change in the associated element of X_{it}. This result allows us to make unitless comparisons of elements of γ_r across regions.

Before discussing differences across the tables in parameter estimates we describe our test of whether these differences are statistically significant. We tested whether all of the elements of γ_r (besides the constant term and time dummies) were equal across the five regions. This involves imposing 20 equality constraints in moving from the null model with five coefficients on

(IMPEN, CAPU, EMP, VADD/OUT, and UNION) to 25 coefficients (five variables and five regions) in the unrestricted model. Under both the null and alternative hypotheses we allow the σ_r and time dummies and constant terms to differ across regions. The value of the likelihood ratio statistic for this test is 124.19, which is significantly larger than the 0.01 critical value from a χ^2_{20} random variable of 37.57. Hence there is strong evidence of significant differences in filing behavior across the five regions.

The general conclusion to emerge from a comparison of results across these tables is that for filing behavior against the European region and the Japan/NICs region, the outcome filing strategy seems the most plausible, while filing behavior against the Canada/Mexico region yields results most consistent with the use of a process filing strategy. For filings against Europe and Japan and the NICs, the coefficient on IMPEN is precisely estimated and of the expected sign, something not shared by the estimation results for any other regional grouping. In addition, the estimated coefficients on CAPU for the European region and on EMP for the Japan/NICs region, additional variables which are important to the ITC's final injury determination, are also estimated with precision and of the expected sign. This is consistent with our outcome filer hypothesis. In contrast, for filings against the Canada/Mexico region, only CAPU is a strong predictor of filing activity, both in terms of its relative magnitude and statistical precision. The other variables important for the ITC's final injury determination lack predictive power for filing behavior against this region. This is consistent with our process filer view. For the planned economies and for our residual other region, it is difficult to argue if the data is at all informative as to which of the two strategies is more likely.

Perhaps the most strikingly uniform result across all of the regions is the dramatic predictive power of UNION. For all importing regions, a higher percentage of unionized workers in an industry predicts a significantly higher number of filings against that region. This presumably reflects the general importance of overcoming the free-rider problem associated with bearing the cost of bringing an antidumping petition forward.

Comparing the Japan/NICs results to the Europe results yields several conclusions. First, CAPU appears to be both an economically and statistically more important predictor of filing activity against Europe than against Japan/NICs. Second, the opposite conclusion holds for IMPEN when comparing the two regions.

Tables 8.7 and 8.8 present our import and domestic output equation results which yield estimates of the parameters of the conditional mean functions given in equation (16) which are used to assess the impact of the investigation process itself and of the outcome of the investigation on the flow of both imports and domestic output.

We make a number of observations. First, the investigation effects implied by the coefficient estimates for $\beta^m_{r,OGP}$ and $\beta^m_{r,OGPLFV}$ in table 8.7 and for $\beta^o_{r,OGP}$ and $\beta^o_{r,OGPLFV}$ in table 8.8 are consistent with our findings regarding the filing

Table 8.7 **Import Equation Estimates (N = 338 industries for T = 6 years)**

Variable	Coefficient Estimate	Standard Error
OGP_{it}^{Japan}/G_{it}	41.95	30.52
$OGPLFV_{it}^{Japan}/G_{it}$	−80.11	35.83
$OGSUS_{it}^{Japan}/G_{it}$	0.0	0.0
$OGWD_{it}^{Japan}/G_{it}$	−33.79	55.02
OGD_{it}^{Japan}/G_{it}	−39.19	18.47
OGP_{it}^{Europe}/G_{it}	11.70	12.28
$OGPLFV_{it}^{Europe}/G_{it}$	−51.37	24.48
$OGSUS_{it}^{Europe}/G_{it}$	−36.59	19.28
$OGWD_{it}^{Europe}/G_{it}$	−7.48	16.62
OGD_{it}^{Europe}/G_{it}	−13.65	6.38
$OGP_{it}^{Planned}/G_{it}$	−59.22	60.51
$OGPLFV_{it}^{Planned}/G_{it}$	77.88	103.45
$OGSUS_{it}^{Planned}/G_{it}$	49.31	22.43
$OGWD_{it}^{Planned}/G_{it}$	−45.91	60.38
$OGD_{it}^{Planned}/G_{it}$	−11.10	3.14
OGP_{it}^{CANMEX}/G_{it}	−42.05	20.11
$OGPLFV_{it}^{CANMEX}/G_{it}$	−69.59	119.63
$OGSUS_{it}^{CANMEX}/G_{it}$	−156.73	186.89
$OGWD_{it}^{CANMEX}/G_{it}$	18.41	35.54
OGD_{it}^{CANMEX}/G_{it}	−25.56	11.34
OGP_{it}^{Other}/G_{it}	−77.86	100.34
$OGPLFV_{it}^{Other}/G_{it}$	87.88	98.13
$OGSUS_{it}^{Other}/G_{it}$	−3.80	14.50
$OGWD_{it}^{Other}/G_{it}$	−8.12	22.17
OGD_{it}^{Other}/G_{it}	−18.02	11.24
Constant	11.64	1.45
YEAR81	−0.74	2.03
YEAR82	0.50	2.23
YEAR83	2.05	2.40
YEAR84	6.12	2.96
YEAR85	7.97	3.26

strategies across regions noted above. In particular, the filing of a petition against firms in Europe or the Japan/NICs region leads to a rise in the rate of imports up until an affirmative preliminary LTFV determination, at which point the rate of imports falls precipitously and remains low until the conclusion of the investigation. These investigation effects are consistent with the outcome filer hypothesis. In contrast, the filing of a petition against firms in the Mexico/Canada region leads to an immediate fall in the rate of imports, which remains low until the conclusion of the investigation. These investigation effects are consistent with the process filer hypothesis. As was true with the filing equation results, the investigation effects implied by the planned

Table 8.8 **Output Equation Estimates (N = 338 industries for T = 6 years)**

Variable	Coefficient Estimate	Standard Error
OGP_{it}^{Japan}/G_{it}	29.92	50.49
$OGPLFV_{it}^{Japan}/G_{it}$	25.24	16.81
$OGSUS_{it}^{Japan}/G_{it}$	0.0	0.0
$OGWD_{it}^{Japan}/G_{it}$	8.58	8.51
OGD_{it}^{Japan}/G_{it}	9.47	21.24
OGP_{it}^{Europe}/G_{it}	−27.10	39.61
$OGPLFV_{it}^{Europe}/G_{it}$	25.54	16.48
$OGSUS_{it}^{Europe}/G_{it}$	−99.83	176.60
$OGWD_{it}^{Europe}/G_{it}$	−20.59	50.81
OGD_{it}^{Europe}/G_{it}	27.05	12.11
$OGP_{it}^{Planned}/G_{it}$	17.92	22.89
$OGPLFV_{it}^{Planned}/G_{it}$	68.81	125.40
$OGSUS_{it}^{Planned}/G_{it}$	51.48	24.18
$OGWD_{it}^{Planned}/G_{it}$	−44.48	51.28
$OGD_{it}^{Planned}/G_{it}$	8.14	4.01
OGP_{it}^{CANMEX}/G_{it}	38.17	21.17
$OGPLFV_{it}^{CANMEX}/G_{it}$	−85.01	190.89
$OGSUS_{it}^{CANMEX}/G_{it}$	−44.50	76.83
$OGWD_{it}^{CANMEX}/G_{it}$	24.48	57.01
OGD_{it}^{CANMEX}/G_{it}	12.19	10.31
OGP_{it}^{Other}/G_{it}	29.07	45.06
$OGPLFV_{it}^{Other}/G_{it}$	−69.70	172.29
$OGSUS_{it}^{Other}/G_{it}$	71.53	145.04
$OGWD_{it}^{Other}/G_{it}$	−98.43	194.73
OGD_{it}^{Other}/G_{it}	15.41	17.92
Constant	285.49	10.31
YEAR81	−8.59	18.39
YEAR82	−16.17	18.45
YEAR83	−14.33	18.43
YEAR84	4.05	18.41
YEAR85	4.45	18.53

economy and the residual other regions are inconclusive with regard to the implied filing strategy. The results from the output equation estimation reinforce these conclusions, although the parameters are estimated less precisely.

As for the differing effects of investigation outcomes on postinvestigation imports and domestic output, our parameter estimates imply that the imposition of antidumping duties against any region strongly reduces imports of the products involved, while the response of domestic import-competing output is positive but less precisely estimated. Petitions against a region which are subsequently withdrawn appear to have no lasting effects on imports or domestic output, confirming our earlier findings (Staiger and Wolak 1994a). Finally,

the paucity of suspension agreements in our sample makes it difficult to assess regional differences (the Japan/NICs region, e.g., did not negotiate any suspension agreements with the United States during our sample period), but to the extent that the estimates are informative they suggest that only suspension agreements with Europe are successful in restricting imports of the products involved. This, of course, does not necessarily imply that suspension agreements with other regions do not reduce bilateral imports from those regions, but only that such agreements are not effective in reducing the overall imports of the relevant product into the U.S. market.

8.4 Conclusion

Our cross-country analysis of the determinants and impacts of antidumping suits has revealed a substantial amount of heterogeneity between the different trading regions. At the most basic level these results show that although there is a large stochastic component, antidumping suit filings are predictable events using observable industry magnitudes. Against Western Europe and Japan and the NICs, the use of antidumping law appears to be consistent with the view that firms file in expectation of obtaining relief via antidumping duties or suspension agreements—outcome filers in our nomenclature. This is suggested by the pattern of filing against these regions, which appears to reflect a concern for meeting the injury requirements necessary to secure a finding of dumping, as well as by the import and domestic output responses to filing and the various phases of the suit resolution process. But we have also argued that a distinctive filing strategy against Canada and Mexico would be expected on *a priori* grounds and, in particular, that Canada and Mexico are the most likely targets of process filing by U.S. firms over our sample period because their export production is predominantly destined for the U.S. market and accounts for a relatively high and stable U.S. market share. In line with these a priori views, we find evidence in the use of antidumping law against Mexico and Canada that is consistent with our process filer logic, where firms file primarily to obtain the protection afforded during the investigation process itself. This is supported by the pattern of filing against these countries, which appears to be driven primarily by the level of capacity utilization but unrelated to other observable measures of injury, as well as by the import and domestic output responses to filing and the various phases of the suit resolution process.

Finally, we can use our coefficient estimates in table 8.7 to provide a rough idea of the magnitudes of all the trade-distorting effects, by region and by type of effect, that are associated with the use of antidumping law during our sample period. We compute the total sample distortions to U.S. imports from the investigation process associated with petitions against region r as follows:

$$D^m_{\mathrm{INV}r} = \sum_i \sum_t \beta^m_{1r}\mathrm{OGP}_{rit} + \beta^m_{2r}\mathrm{OGPLFV}_{rit}.$$

The total sample distortions to U.S. imports from the postinvestigation effects due to petitions against region r are computed as follows:

$$D^m_{\text{END}r} = \sum_i \sum_t \beta^m_{3r}\, \text{OGSUS}_{rit} + \beta^m_{5r}\, \text{OGD}_{rit}.$$

We exclude the effects of withdrawn petitions because the coefficients associated with OGWD_{rit} in the import equation are never statistically different from zero. We then compute IMPTOT, defined as the sum of multilateral imports over all industries and years in our sample, and express $D^m_{\text{INV}r}$ and $D^m_{\text{END}r}$ as a percentage of IMPTOT.

For our sample of industries and for the six years of available data, the total amount of U.S. import reductions from all investigation effects against Western Europe amounts to approximately −0.05 percent of total U.S. imports over the sample period, while the total distortion attributable to postinvestigation effects against Western Europe is −1.14 percent of total imports over the sample period. For Japan and the NICs, the distortions to U.S. imports from investigation and postinvestigation effects from petitions against this region amount to 0.87 and −2.31 percent, respectively, of total U.S. imports.[10] For both these regions, the major import distortions associated with the use of antidumping law are attributable to postinvestigation effects. For Mexico and Canada, on the other hand, the relative importance of investigation and postinvestigation effects is reversed: the distortions to U.S. imports associated with investigation and postinvestigation effects of petitions against Mexico and Canada are −0.84 and −0.25 percent, respectively, of total U.S. imports. This conforms to our findings that U.S. firms appear to be outcome filers against Europe and Japan and the NICs, and hence the main import restrictions come with the explicit remedies provided by the law (duties or suspension agreements), while U.S. firms appear to be process filers against Mexico and Canada, and hence the main import restrictions come from the investigation effects.

A final implication of our process filer/outcome filer distinction is that the frequency with which outcome filers ought to secure duties should be substantially higher than for process filers. To investigate this hypothesis we computed the sum of OGD_{rit} in Mexico and Canada for all industries and all six years in our sample, and then divided this sum by the sum of f_{rit} for all industries and all six years for the same region. This ratio gives the per-suit level of duty activity against Mexico and Canada, the region against which U.S. firms appear to be process filers. We then repeated this calculation for Europe and Japan and the NICs, treating this as the aggregate region against which U.S. firms appear to be outcome filers. Dividing the "outcome filer ratio" by the

10. The positive boost to U.S. imports associated with investigation effects of petitions against Japan and the NICs reflects the fact that the effect of filing on imports is positive and relatively large and the effect of an affirmative preliminary LTFV determination, while negative, does not persist long enough to reverse this cumulative positive effect.

"process filer ratio" yields 3.73, suggesting that in our sample, a product-level antidumping petition is 3.73 times more likely to end in duties when it is filed against firms in Europe, Japan, or a NIC versus firms from Canada or Mexico. This result is consistent with the view that suits against Canada and Mexico are filed less for the eventual protection provided by duties than are suits against Europe and Japan and the NICs.

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Comment

Kala Krishna

This is a really nice paper, both for the interesting econometric methodology used, as well as for the questions asked. In previous work, Staiger and Wolak empirically examined the determinants of suit filing and the trade impacts of U.S. antidumping law. Here, they build on that work to try and see whether there are differences in "the uses and effects of U.S. antidumping law on imports and domestic output across the major regions exporting to the United States." The overall topic is of considerable importance for policy as previous work has shown that filing itself, as well as settlement, and not just winning the case, has effects on prices and imports in the market. This suggests that antidumping petitions may actually be used to support tacit collusion as argued by Prusa (1991, 1992).

My comments are divided into three parts. In the first part, I argue that there seems to be a problem in one of the key features of this paper, namely, an attempt to distinguish between what the authors call "outcome" and "process" filers. In the second, I make some suggestions for extensions which may or may not be feasible. And in the third, I make some suggestions for organization and presentation. I shall say little about the econometrics: it is always easy to point out that the specification rules out interactive effects of a particular kind, and I leave these criticisms to the reader. Rather, I shall try and focus on what might be conceptual or organizational issues and possible extensions.

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One of the key features of this paper, in contrast to its precursors, is that it attempts to show that suits are filed for different reasons on different groups of importers. The five groups are (1) Canada and Mexico, (2) Europe, (3) Japan and the NICs, (4) planned economies, and (5) other countries. At the heart of their analysis is a distinction between what they call "outcome filers" (firms for which the prospect of an antidumping duty is an important ingredient in the decision to file) and "process filers" (firms for which filing is driven largely by a desire to secure the trade restricting effects of the investigation process itself). There is, however, a bit of a problem with this aspect of the paper.

First, trying to infer the motivation of filers—what is going on in their heads—from the outcome is always difficult. The reasons for filing could easily be the same, but the outcome different, if the countries themselves differ. U.S. law provides for an assessment of "critical circumstances" under which duties can be retroactively imposed to the date of filing if filing brings with it a surge of imports. Given this, it could be that one country or group of countries behaves differently because its importers are risk averse and cannot afford to take the chance of retroactive duties, and not because of a difference in the kinds of suits filed. However, in all fairness I should also point out that there are other pieces of the puzzle which the authors also consider in their arguments.

Second, there are likely to be mixed motives in any filing, and a priori, I for one would not expect to be able to separate them based on the kind of data that is likely to be available. Case studies and interviews might help here, but I can see very little else that might.

Third, it is commonly understood that antidumping suits filed in steel were of a very different form than those elsewhere. The attempt to flood the system with petitions by this industry commonly hypothesized might suggest taking steel cases out of the data and looking at them separately.

Fourth, if Europe and Japan attract outcome filers as suggested, then these suits should be stronger intrinsically than those against the other countries. Is this reflected in the settlement and determination data? A by-product should also be that for stronger suits, as the probability of antidumping duties is higher, imports should fall more after a preliminary positive finding than for weaker suits. However, in the import equations, the coefficient on the OGPLFV variable is negative in all but the planned economies case, though it is not significant for the other country group.

Moving on to the second part of my comments, possible suggestions for extensions, a different cut at the data might be to look at what happens in the cases where there is a negative preliminary finding. Are there any such cases? Do the different groups of countries look different?

Another question that might be worth pursuing is whether there has been a change in recent years in the way that antidumping suits have been used. There is a perception that in recent years such suits have been increasingly used to implicitly restrict imports and that nuisance suits are on the increase. Is there any evidence of such a change in regime?

Finally, some simple presentation changes could help improve the readability of the paper. First, it is always nice to see some rough data cuts which, without any sophisticated econometrics, might help motivate the main thrust of the paper: that suits against Europe and Japan look different than those on other countries. Are the settlement rates higher? Are the positive finding rates higher? Are the dumping margins evaluated higher?

Second, the regressions could be better presented. To make it easier to compare against countries, the results on the same variable across countries could be put on one row, with the level of significance given for ease of comparison.

Third, the model itself should be relegated to an appendix and a quick summary left in the text. It is hard to plough through it to get to the results.

To conclude, the paper has many things to recommend it. The questions it asks are important and thought provoking, as well as cleanly analyzed. I look forward to seeing more on this important issue in the future.

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Comment

Anne E. Brunsdale and Keith B. Anderson

The most interesting contribution of this paper and of an earlier one by the same authors (Staiger and Wolak 1994) is their estimates of the effects antidumping investigations and orders have on the quantity of imports. The authors examine not only the effect of antidumping orders—the end result of a "successful" petition—but also how imports are affected at various stages in the investigational process. They find that imports are significantly reduced once the Department of Commerce finds that the price of the subject imports is too low. (In the jargon of antidumping law, the subject imports are found to be sold at less than fair value (LTFV).) In some cases the decline in imports comes even sooner—as soon as the investigational process is triggered by the filing of a petition. Completion of the investigation and the entry of a final antidumping order generally leads to no additional decline in imports.[1]

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1. The authors also look at the effect of the suspension of an investigation as the result of an agreement being reached with the foreign producers and the effect of the withdrawal of a petition prior to final action. The authors also examine the effects of antidumping orders and investigations

These results should not be surprising to those who are familiar with the arcane and convoluted process involved in establishing antidumping duties. However, it is useful to have empirical evidence to support our intuition. Under the statutory scheme, once the Commerce Department finds that imports are being sold at an unfairly low price, importers must begin posting bonds equal to the estimated dumping margin. (The importer's ultimate liability is determined by an *ex post* comparison of the price actually paid and what the Commerce Department determines to be the fair value of those imports.)[2] Provided the U.S. International Trade Commission (USITC or ITC) finds material injury, nothing really changes when the final order goes into place. Bonds covering estimated dumping margins are still required, and the importer's ultimate liability remains indeterminate until an *ex post* review is conducted.[3] Therefore, it is not surprising that the effects prior to the final order are similar to those afterward.[4]

While these findings are useful and consistent with our expectations, we are concerned that Staiger and Wolak seem to have assumed that every dumping investigation has the same effect on the dollar value of imports and domestic production.[5] The effect of a dumping case is assumed to be independent of the size of the industry, the unfair imports' share of the total sales in the industry, and the degree to which the prices charged are below fair levels—the size of the dumping margin. Simple economic theory suggests that these assumptions cannot be correct. Effects should be greater in larger industries and in industries where the unfair imports account for a larger percentage of total sales. Similarly, the effect should be greater where the difference between the actual price of the imports and their "fair" level is relatively high.[6]

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on domestic production. In general, the estimates of these effects are much less robust than the effect on imports.

2. In general, fair value is the price charged in the country where the imported product is produced, the price in some third country, or the total cost of producing the product, including statutorily mandated minimum levels for profits and overhead expenses. (For a general discussion of the details of U.S. antidumping practice, see Horlick [1989].)

3. In fact, reviews are not always conducted. If no interested party requests a review covering imports during a period of time, the importer's final liability is simply set equal to the estimated dumping duty.

There is one minor difference between the importer's ultimate liability before a final dumping order is entered and its liability after the order is entered. Prior to the publication of the final dumping order, the importer's maximum liability is the level of the bond paid. After the order is in place, this is no longer true. If the Commerce Department ultimately determines that the margin of dumping is greater than the bond that has been posted, the importer is required to make up the difference. During either period, if the ultimate margin is less than the bond, the difference is refunded.

4. Similarly, an investigation can only be stopped by means of a suspension agreement if the foreign producers agree to raise their prices to completely eliminate their unfairly low prices. Thus, it is not surprising that Staiger and Wolak find that a suspension agreement has the same effect as a final order.

5. Technically, the assumption is that the effect per tariff classification covered by the investigation is a constant.

6. In addition, the effect will depend on the degree to which the imports and the domestic product are substitutes, the elasticity of demand for the product, and the elasticity of domestic supply.

That the effects of antidumping cases on imports and domestic shipments differ substantially from case to case can be seen by looking at the eight cases examined by Anderson (1993b) in a study of the welfare effects of antidumping actions. In these cases, we estimate that the antidumping process on average caused imports to decline by approximately $31 million per year and domestic production to increase by about $28 million per year.[7] However, there were very large differences from case to case. In chrome-plated lug nuts from the People's Republic of China, the antidumping investigation and order decreased imports by only an estimated $200,000 per year and increased the value of domestic shipments by only about $100,000. At the other extreme, the antidumping investigation and order involving portland cement and cement clinker from Mexico decreased imports by approximately $145 million and increased the value of domestic shipments by approximately $165 million.[8]

In addition to estimating the effects of dumping investigations, Staiger and Wolak seek to test two alternative models of why antidumping petitions are filed. In the first model, the petitioner—an "outcome filer"—is hypothesized to be truly interested in the long-term reduction in imports that will result from a final antidumping order. The second model hypothesizes that some petitioners—"process filers"—merely want to obtain the temporary benefits that will arise while the investigation is underway. These petitioners supposedly do not care much whether they get an affirmative final injury determination, just that they get an affirmative preliminary injury determination and an affirmative LTFV determination so that duties will be collected for a few months. They only care about temporary benefits because they and foreign producers have, at least tacitly, a market-sharing agreement which is threatened by a temporary downturn in demand and resulting excess capacity. The filing of a dumping petition will, the authors hypothesize, persuade the foreign producers to keep to the agreement and not engage in active price competition.

While the notion that firms may use the antidumping process to limit competition has a certain appeal and is not new,[9] Staiger and Wolak's model suffers from a misunderstanding of exactly how the administrative process works at the ITC. One area of misunderstanding is the authors' belief that the commission's preliminary determinations are based on the information contained in the petition and that the commission does not have information on a number of factors, such as employment and import penetration, that will be considered in

7. These estimates are based on standard partial equilibrium analysis using the elasticities and other parameter values discussed in Anderson (1993b). The domestic production change figures are based on the midpoints of the estimated ranges of values for the individual cases reported there. The level of imports after the antidumping process has had its effect, and therefore the change in imports resulting from the process, is estimated from the reported tariff revenue effects and knowledge of the size of the antidumping duty and of any existing regular duty.

8. We note that these estimates are for the entire case, while Staiger and Wolak examine the effects per included tariff classification. This however does not alter our point. Since there were three harmonized tariff categories affected by cement and one in the case of chrome-plated lug nuts, the effects per import category are several hundred times greater in the case of cement than in lug nuts.

9. The same argument has been made in Messerlin (1990).

a final investigation. This is not correct. Prior to a preliminary determination, the ITC staff conducts its own investigation of the subject imports and the condition of the domestic industry. In addition, the staff holds a public hearing where both petitioners and respondents have an opportunity to make arguments and provide information, and both parties have the opportunity to submit briefs arguing their case. While the information available at the time of a preliminary determination is not as complete as is available at the time of a final determination, the same types of data are available and are the result of an independent investigation by ITC staff, not a simple reliance on the information contained in the petition.

A second misunderstanding relates to the use of data on industry performance during the period between the filing of a petition and the time of the final ITC injury determination. Staiger and Wolak hypothesize that foreign producers will not compete aggressively during the pendency of an antidumping investigation since a less aggressive stance during this period should reduce the likelihood that the domestic industry will be found to be materially injured. While the logic of this argument is impeccable, it has not gone unnoticed by ITC commissioners. As a result, the commission is very reluctant to place much weight on evidence relating to the period after a petition is filed. Indeed, the reluctance is sometimes carried too far. In a 1991 case involving fresh Atlantic salmon from Norway, the majority of the commission found injury even though salmon imports from Norway had declined precipitously since the filing of the petition as a result of changes in exchange rates, not as a result of any action taken by the Norwegian producers.[10]

If the process-filer theory has shortcomings, how does one explain the difference in results found between cases involving Western European and major Asian countries and those involving other countries? Why does the level of imports increase when a petition is filed against imports from Western Europe or Japan and the Asian NICs but decline when a petition is filed against imports from other countries? Staiger and Wolak see this as evidence that their outcome-filer model explains cases filed against Europe and Japan and the NICs, while the process-filer model explains cases against the developing countries. However, it seems to us that the result may have more to do with the ability to control the timing of shipments than with the strategy behind the filing. If an imported good is coming from one of the major developed countries, controlling when the shipment is received is likely to be easier than when the good is being produced in a country with less-developed manufacturing, communications, and transportation systems. (While this may be becoming less true today, recall that the authors' data covers the period from 1980 to 1985.) As a result, importers may be hesitant to place orders for shipments

10. Cf. the dissenting views of Acting Chairman Anne E. Brunsdale (USITC 1991, 33–35) with the views of the commission (USITC 1991, 17). ("We have given less weight to the recent decline in imports in 1990 because it appears to be largely the result of the filing of the petition and/or the imposition of provisional antidumping and countervailing duties.")

from such countries after a petition is filed for fear that the order will not arrive until after the preliminary decision and that they will therefore be liable for dumping duties of an unknown magnitude.[11]

In conclusion, in spite of some methodological concerns, the most interesting finding of the two papers by Staiger and Wolak is the empirical confirmation that the effect of an antidumping order occurs no later than the Commerce Department's preliminary LTFV determination. There is no additional effect from the entry of an antidumping order at the end of the investigational process. There appear to be more significant problems with the authors' attempt to model and test the reasons firms choose to seek antidumping orders.

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11. The authors, of course, also find differences in the determinants of petition filing depending on the country from which the product is coming. In terms of that equation, the support for the process-filer model appears to turn on the absence of a significant relationship between filings and import penetration for countries other than the major developed countries. Import penetration is included in the filing equation because it is presumably an important determinant of ITC decision making. However, both our understanding of the analysis employed by most ITC commissioners during the late 1980s and early 1990s and available empirical evidence suggest that this is not the case. (For a discussion of the analytic methods used by different ITC commissioners, see Kaplan [1991]. An empirical indication that import penetration is not an important determinant of commission decisions is found in Anderson [1993a].)

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