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DISCUSSION PAPER**

**What is the Effect of U.S. Antidumping Duties on Imports?
Some Evidence from the Sunset Review Process**

by

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ABSTRACT

The voluminous literature on the U.S. antidumping laws has a curious lacuna. There is little in this literature about the effects of antidumping duties on the volume of subject imports. One reason this key question has not frequently been investigated is the lack of data. U.S. antidumping duties are firm specific, while information about U.S. imports is collected by commodity and country, but not by firm. This paper avoids this problem by examining a sample of U.S. antidumping orders for which the duties were the same for all firms from a given country, or for which there was only one foreign firm exporting the product from the foreign country in question. Using this sample, the present paper is the first study of which the author is aware that investigates the relation between antidumping duties and subject imports using accurate information about the level of antidumping duties. The paper is also unique in accurately measuring the quantity of imports affected by the antidumping duties. The study uses import quantity data reported by the USITC in its Sunset Review reports, rather than using ten-digit HTUSA categories, which sometimes do not match antidumping product definitions precisely. The price of using this unique dataset is that the current study is restricted to a sample of only 32 of the approximately 350 antidumping orders originating during the relevant years, of which about 188 are still in effect. Some evidence is presented suggesting that the sample of orders used may be representative of the larger universe. For the sample examined, the paper finds an elasticity of subject imports with respect to U.S. antidumping duties of roughly 0.9. The paper also finds some evidence that age of the antidumping order may be a factor in explaining reduction in volume of subject imports. Study of this effect may be complicated by the fact that the initial level of all U.S. antidumping duties was lower during the early 1980s than in the early 1990s; so older orders tend to have lower duties. The study finds inconclusive evidence about the effect of antidumping orders on the price received by the foreign suppliers of subject imports.

The large literature concerning the U.S. antidumping laws is surprisingly lacking in estimates of the effects of antidumping orders on the level of imports covered by the orders. One reason for the relative neglect of this important question is that U.S. antidumping duties are assessed by firm, while U.S. import statistics are collected by product and country. This paper attempts to avoid this problem by examining a sample of data about U.S. import of products for which antidumping duties were assessed, but for which the duties were the same for all firms from the country in question, or for which there was only one foreign firm exporting the product from the country. The paper uses import quantity data reported by the United States International Trade Commission in its Sunset Review reports. These data may be more accurate than the ten digit HTUSA data sometimes used in such studies, which may not match antidumping product categories precisely.

Earlier Studies

A number of recent papers have discussed the general subject of the effect of U.S. antidumping duties on import volume. Two examples are the recent study by the United States International Trade Commission (1995), and the recent study of antidumping and pass-through by Bruce Blonigen and Stephen Haynes (2002).

The USITC study is an excellent piece of work applying a common methodology to ten products that have been subject to either antidumping or countervailing duties, or both.¹ Six of the cases studied are either Countervailing Duty (subsidy) cases or mixed Antidumping/Countervailing Duty cases. Four cases in the USITC study—EPROMS, Color Television Picture Tubes, Urea, and tapered roller bearings—are exclusively antidumping matters. For each of these products, the ITC study uses a computable partial equilibrium model to estimate both the effects of the ‘unfair’ trade, and the effect of the antidumping remedy. For EPROMS, for example, the ITC study estimates that the antidumping duties would have caused imports of EPROMS from the subject country (Japan) to cease, had other factors remained constant. For color TV picture tubes, the model estimates that the *ceteris paribus* reduction in subject imports into the U.S. with the antidumping duties to have

¹Antidumping duties are used against foreign products sold in the United States below ‘fair’ or ‘normal’ value. Countervailing duties are used against foreign products that have received an illegal subsidy by a foreign government.

been about 20%.² But what level of antidumping duties account for these levels of reductions of imports? Much of the interest of such estimates lies in a (perhaps implicit) notion of the elasticity of subject import volume with respect to antidumping duty level.

Information about the level of the antidumping duties is included in the USITC Report. But it is difficult to know whether one can use this information to make any inference about the responsiveness of the subject imports to the antidumping duties.³ The reason is that for each antidumping order studied, the duties differ by firm, but the corresponding U.S. import data do not. In the case of color TV picture tubes, Urea, and tapered roller bearings, different antidumping margins are averaged across firms in different countries. (For example, for Urea, the antidumping margin was 44.8% for East Germany, 90.71% for Romania, and from 53.23% to 68.26%, depending on the firm, from the U.S.S.R.) Different firms also had different antidumping duties within particular countries in cases of color TV picture tubes, and tapered roller bearings.⁴ The EPROM antidumping duties were only against Japan, but the four Japanese firms had dumping margins ranging from 60.1% (for Toshiba) to 188% (for NEC). Since import data is available only by country and product, the USITC Study used a trade-weighted average of the firms' antidumping duties.

Since the relation of interest is the effect of antidumping duties on subject imports [i.e. subject imports = $f(\text{Antidumping duty})$], the use of a weighted average antidumping duty (as occurs in all cases in the ITC study, either because there are several firms from a given country with different margins, or because information from several different countries is being combined, or

² For urea, the ITC study found that subject imports into the U.S. would have ceased with the antidumping duties, and for tapered roller bearings, the reduction in subject imports would have been about 57%.

³ If one were to simply divided the percent change in subject import volume by the asserted antidumping duty, the ITC estimates would not be unreasonable. In the cases of EPROMS and urea, asserted antidumping duties of 93% and 64.5% are associated with cessation of subject imports; for color TV picture tubes, an asserted duty of 7.6% is associated with a decline of subject imports of about 20% (an implied elasticity of about 2.6); for tapered roller bearings, an antidumping margin of about 63% is associated with a decline in subject imports of about 57% (an implied elasticity of about 0.88).

⁴ When announcing antidumping margins, the Department of Commerce announces margins for specific firms and also often announces an 'all other' margin for smaller producers. The Commerce Department determines this 'all other' margin by taking a trade-weighted average of firm specific antidumping duties.

both), creates an error in the right-hand side variable in the desired relation. Such errors cause estimates of coefficients that are biased, and possibly inconsistent.

The very interesting paper by Blonigen and Haynes (2002) faces similar problems. The paper studies the effect of U.S. antidumping duties on two varieties of steel imported from Canada: cut-to-length plate, and corrosion resistant steel. The difficulty is that all three Canadian exporters of cut-to-length plate were assigned different antidumping margins, and the four Canadian exporters of corrosion-resistant steel were assigned three different margins. Blonigen and Haynes dealt with this problem in the same way used by the authors of the ITC study discussed above. They used the antidumping duty assigned to ‘all other’ exporters (a trade-weighted average for each product) as the relevant duty. This approach has the same limitations discussed above.

The Blonigen and Haynes paper also used ten-digit HTUSA data to measure the effects of the antidumping duties on steel. Ten-digit HTUSA categories sometimes do not coincide with the categories on which antidumping duties are assessed. (This issue is discussed below.) While it is not known whether the boundaries of the HTUSA categories used by Blonigen and Haynes coincide with the boundaries of the products which the USITC identified for ‘cut-to-length plate’ and ‘corrosion resistant steel’, there are risks that they do not.

In addition to these two papers, there are a number of other papers dealing with related aspects of the question addressed in the present paper. Blonigen and Prussa (2003) point out that the costs to the United States of U.S. antidumping actions may be higher than one might suspect if one (incorrectly) views antidumping duties as tariffs. There are two reasons for this: the prospect of U.S. antidumping duties may cause foreign firms to take evasive action,⁵ and the Administrative Review Process associated with antidumping orders may cause foreign producers to capture much of the rent from the duties. An interesting paper by Staiger and Wolak (1994) also raises the point that the mere process of filing an antidumping petition can reduce target imports, even if no formal affirmative finding of dumping is made. Staiger and Wolak studied the effects of antidumping investigations by examining a broad sample of products with import data at the seven digit HTUSA level. One limitation of the Staiger and Wolak study may be its use of seven digit HTUSA data for

⁵ See (Nye, 2005) for evidence that foreign firms have restricted their exports to the U.S. to avoid Critical Circumstances penalties under the U.S. antidumping law.

import volume. As discussed below, even ten-digit HTUSA data may not fit antidumping categories precisely.

Approach of The Current Paper

The fundamental problem is that antidumping duties are assigned by firm, while U.S. import data are collected by product and country. The current study attempts to deal with this problem by selecting a sample of antidumping orders in which there is either only one foreign firm in a country facing antidumping duty on a given product, or in which all firms in the country affected are assessed the same duty. The data on import quantity were gathered from the information published in the Sunset Reviews of U.S. antidumping orders. The Sunset Review process was added to the U.S. antidumping law in 1995 as a result of the Uruguay Round Agreement, which created the World Trade Organization. (Antidumping and Countervailing Duty Handbook, 2002) According to provisions of the 1995 Act, the U.S. began reviewing each new antidumping order after five years, with an eye to determining whether it should be revoked. The Department of Commerce and USITC also began reviewing the hundreds of outstanding old orders. By February 2003, 359 U.S. antidumping orders had faced Sunset Review. 188 of these had been continued, and 171 had been revoked. (Department of Commerce International Trade Association website) For the large majority of these Sunset Reviews for which the Antidumping order was continued, the USITC report of the matter contains information about the volume of subject imports at the time of the Sunset Review. The USITC Reviews often also compare the information about current import levels of subject goods to the level that existed at the time of the original antidumping order. These data provide the basis for this paper.

Antidumping Product Categories Versus Ten Digit HTUSA Categories

Each of the thousands of Federal Register notices concerning the many outstanding antidumping order contains, after a verbal description of the product, and a list of relevant HTUSA numbers, language similar to the following: “The HTUSA item numbers are provided for convenience and customs purposes. The written product description remains dispositive.” The reader is left to wonder about the extent to which the HTUSA data accurately reflect true import

volumes of covered products. One virtue of the present study is that by using quantity data presented in the USITC Sunset Reports, it is believed that this problem can be avoided.⁶

How important is the present paper’s use of import volume data from USITC Sunset Reports, rather than reliance on import data about the relevant USITC categories? Perhaps quite important. Table 1 shows the difference in the two sets of data for one product used in this study: Helical Spring Lock Washers from Taiwan. The Sunset Review for this product occurred in June 2003.

Table 1 shows that the warnings by the USITC and Department of Commerce are worth heeding: the boundaries of the category ‘Helical Spring Washers’ are very different from the boundaries of the relevant ten-digit HTUSA category. In this case, the affected U.S. imports in 1990 were only a 20% subset of the imports of the entire ten-digit HTUSA category. From 1991 to 1992,

Table 1: Comparison of Import Volume Data from USTIC Sunset Reports Versus Ten-Digit HTUSA Categories: The Case of Helical Spring Lock Washers From Taiwan

	1990	1991	1992
U. S. Imports from Taiwan, thousands of lbs., Sunset Report data ⁷	388,000	1,056,000	735,000
U.S. Imports from Taiwan, thousands of lbs. HTUSA 7318210000 (‘Spring washers and other lock washers)	1,888,560	1,515,246	1,720,506

⁶ The USITC, Commerce Department, and Customs Service need to know the exact product boundaries of each antidumping order so that duties can be assessed on the correct products. But Sunset Reviews are the only place of which the author is aware in which the associated import volume information is publicly presented.

⁷ ‘Helical Spring Lock Washers From China and Taiwan’, investigation 731-TA-624-625 (Review), USITC Publication 3384, January, 2001.

imports of products covered by the duty fell by 30%, while imports of the associated (larger) ten-digit HTUSA categories increased by about 13%.⁸ The extent of the differences between antidumping product categories and ten-digit HTUSA categories is not known. But the issue may be serious. The present paper attempts to avoid these difficulties by using import volume data from the Sunset Review publications, which are believed to match the antidumping categories.

A Very Simple Theoretical Approach to the Relation Between Antidumping Duties and Volume of Subject Imports

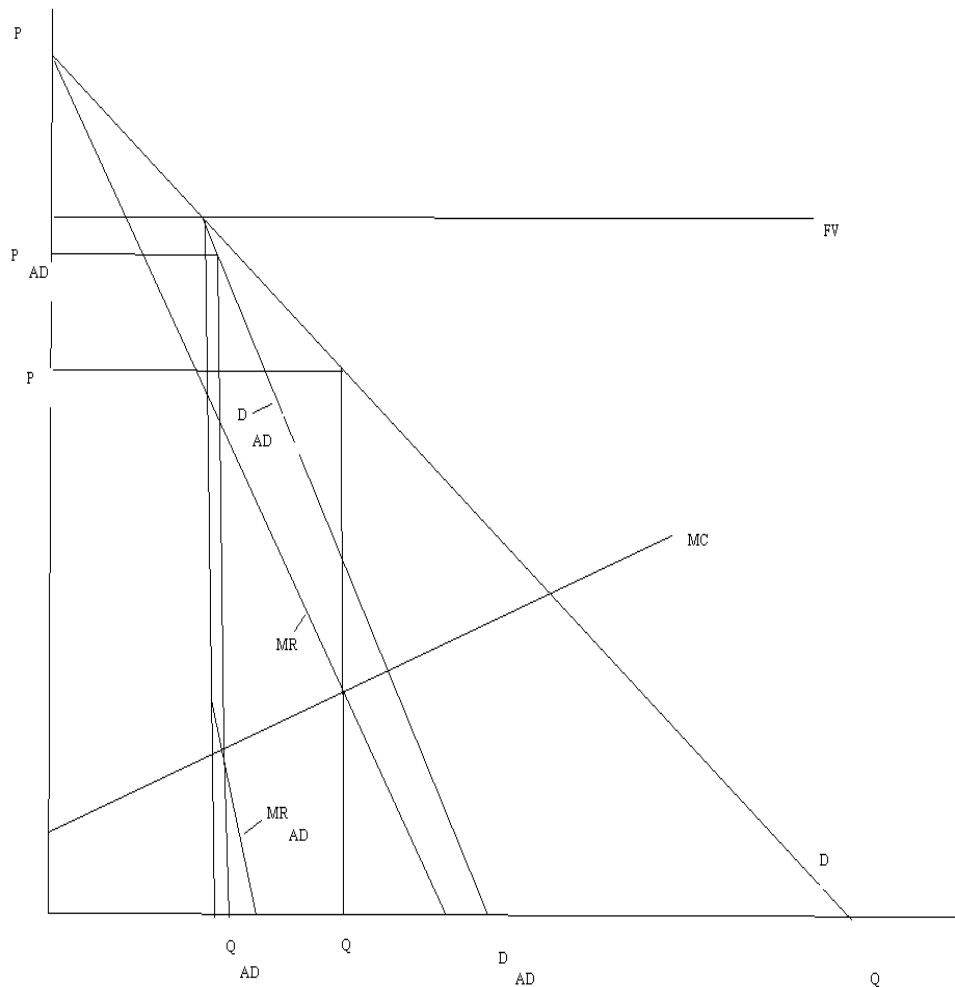
Diagram 1 presents a very simple demonstration of the relation between antidumping duties and import volume that is under study in the present paper.

Before the antidumping duty, the exporting firm sells in the United States at a price and quantity determined by the intersection of its marginal cost schedule, MC, and the marginal revenue schedule associated with the demand curve, D, that it sees for its products in the U.S.⁹ The antidumping order amounts to the determination of a 'Fair' or 'Normal' value for the foreign product.¹⁰ (The antidumping duty will be expressed in percentage terms as the amount by which the import price must increase to reach Fair Value. But Fair Value is the important notion to keep in mind when considering the importing firm's choice of output.) Fair Value is shown by FV in the Diagram. When the antidumping order is in place, the foreign firms see a demand schedule, D_{AD} , that has a kink at the intersection of FV and D. When the antidumping duty is in place, the marginal revenue schedule seen by the foreign firm has a break at the export level at which FV intersects D.

⁸ The current HTUSA listing includes a ten digit HTUSA category, 7318210030, ('Helical Spring Lock Washers'), which might seem to fit the antidumping order product definition more closely than 7318210000 (the category listed in the antidumping order), but for which zero imports are reported from Taiwan during the years shown in Table 1. I suspect the HTUSA category 7328210030 was created after 1993. Alternatively, 'Helical spring washers' may be a more heterogeneous commodity than a layman expects.

⁹ In the simple model presented in the paper, the effects of competing foreign and U.S. goods are collapsed into the demand schedule seen by the foreign firm under discussion.

¹⁰ 'Fair' or 'Normal' value is determined by the larger of A.) The price for which the good is sold in its home market, B.) The price at which the good is sold in non-U.S. export markets, or C.) The average cost of production.



As a result of the antidumping duty, the foreign firm in the Diagram decides to reduce its sales in the U.S. to Q_{AD} .

From the Diagram, it is apparent that the shift in marginal revenue schedule caused by the antidumping duty will cause the foreign firm to reduce the volume that it sells in the U.S. The Diagram suggests that the effect of the antidumping duty on the price received by the foreign firm may be less clear.¹¹ In the example illustrated, the price received by the foreign firm goes up. But it is apparent that with small changes in demand or cost schedules, the price could decline.

¹¹ Of course, the price paid by the consumer in the U.S. will be higher than the price received by the foreign firm because of the antidumping duty.

A simple algebraic version of the diagram above, with linear demand for the foreign product subject to the antidumping order, and linear marginal cost is presented below.

The demand curve seen by the foreign firm for sales in the U.S. is:

$$(1) Q_D = \beta_0 + \beta_1 P$$

Q_D is the quantity demanded in the U.S. P is the price received by the foreign firm for selling in the U.S.

$$(2) Q_S = \alpha_0 + \alpha_1 P$$

Equation (2) represents the supply schedule of the firm exporting to the U.S.

Before the antidumping duty, the sales level to the U.S. and the price are set where the firm's marginal revenue from its U.S. sales equals the marginal cost of sales. This occurs at (P_0, Q_0) .

$$(3) P_0 = [\alpha_0 - \beta_0/\beta_1]/[2 - \alpha_1] \text{ and}$$

$$(4) Q_0 = \beta_0 + [\beta_1 \alpha_0 - \beta_0]/[2 - \alpha_1]$$

Imposition of an antidumping duty means determination of a Fair Value, FV. Given the pre-dumping price P_0 ,

$$(5) FV = (1 + AD) (P_0)$$

As shown in the Diagram, imposition of the antidumping duty causes a kink in the U.S. demand schedule (at $P = FV$) seen by the foreign firm. The Diagram also shows a jump in the marginal revenue curve seen by the foreign firm at this output level. If the foreign firm's supply schedule intersects the post-duty marginal revenue curve in its lower segment, as shown in the Diagram, then the U.S. sales level with the antidumping duty is:

$$(6) Q_{AD} = [\alpha_1\beta_0 - (\alpha_1\beta_1)(FV)(AD) + \beta_1(1 + AD)]/[2\alpha_1 - \beta_1(1 + AD)]$$

$$(7) P_{AD} = [\alpha_1\beta_0 - \alpha_1\beta_1(FV)(AD) + \beta_1(1 + AD) - (\beta_0 - \beta_1(FV)(AD))(2\alpha_1 - \beta_1(1 + AD))]/[\beta_1(1 + AD)(2\alpha_1 - \beta_1(1 + AD))]$$

The Sunset Review Data

As noted above, the United States changed its antidumping enforcement policy in 1995, in response to the Uruguay Round of trade negotiations, to include a Sunset Review process according to which all U.S. antidumping duties would be reviewed after five years. The large outstanding stock of existing antidumping orders—many of which had in place for more than ten years—were also to be reviewed in orderly fashion. As of February 1, 2003, 359 antidumping orders had been reviewed under the Sunset process. 188 of these orders had been continued and 171 had been revoked.

Few Antidumping Orders are Revoked Through Administrative Reviews

There has long been a provision in the U.S. antidumping regulations for Administrative Reviews of Antidumping Orders. These Reviews are distinct from Sunset Reviews, were occurring before Sunset Reviews began in 1995, and are still taking place. Administrative Reviews are frequently undertaken, but only in response to request by the affected foreign firm(s) or by domestic rivals. Administrative Reviews are important, because they offer foreign firms a chance to have the level of their antidumping duty changed and to receive a refund on the deposit it was compelled to post, if the firm has changed its U.S. price in the past year.¹²

¹² If the Administrative Review determines that the foreign firm has **increased** its level of dumping (i.e. lowered its U.S. price in relation to Fair Value) beyond the level found at the time of the order, then the foreign firm may be required to pay additional duty above and beyond the original amount.

According to the NBER data set assembled by Bruce Blonigen and his associates, there were 321 antidumping orders put in place between 1980 and 1995. This is quite close to the number of antidumping orders reviewed at Sunset by February 2003 (359). The similarity of these numbers strongly suggests that few antidumping orders were revoked under the Administrative Review process. Almost all revocations occurred under the Sunset Reviews.

Continued Orders Compared to All Orders (1) : The Standards for Revocation at Sunset Review

The data used in the present study are derived from a sample of antidumping orders that were continued after Sunset Review. So it is important to know how these Continued antidumping orders compare to the universe of all orders.

The standards for revocation or continuation of an antidumping order upon Sunset Review are interesting. According to the Sunset Policy Bulletin, an Antidumping Order must be continued if: “...revocation...is likely to lead to continuation or recurrence of dumping...” The standard for determination that revocation will lead to continuation or recurrence of dumping is that “...(a) dumping continued at any level above *de minimis* after the issuance of an order, (b) imports of the subject merchandise ceased after the issuance of the order, or (c) dumping was eliminated after the issuance of the order and import volumes for the subject merchandise declined significantly.”

These standards are puzzling, to say the least. Apparently, if a foreign firm confronted with an antidumping order raises its (U.S.) price so that it can sell above Fair Value in the U.S., and this price hike causes its sales in the U.S. to cease, this could be grounds for continuation of the antidumping order. (The logic of the regulations seems to be that the order caused the cessation of (dumped) imports, and dumping would resume in the absence of the order.) Conversely, if the foreign firm does **not** raise its U.S. price when confronted with the antidumping order, this could also be grounds for continuation.

Fortunately, the **de facto** practice for continuation of antidumping orders seems somewhat more comprehensible. An examination of the Federal Register Notices announcing revocation of antidumping duties under the Sunset Review process shows that, for all revoked orders examined, the stated reason was that “...no domestic interested party responded to the Sunset Review Notice...”

Given the information above, it is not completely clear how one would expect the subset of

continued orders to differ from the full universe of orders. One might suspect that the 188 orders continued after Sunset Review might differ from the universe of 359, because orders which U.S. rivals did not bother to seek to extend might be orders for which imports were very responsive to antidumping duties (orders for which imports declined greatly, or ceased). But, according to the official Sunset Policy, complete cessation of subject imports should make revocation of the order **less** likely compared to substantial reduction of import level, accompanied by substantial price hike. And the 188 continued orders include many cases in which imports ceased after the order.¹³ Clearly, the regulations alone will not fully resolve the interesting questions about how continued antidumping orders compare to the universe of all orders.

Continued Orders Compared to All Orders (2) : Older Antidumping Orders are More Likely to be Revoked Under Sunset Review

Older antidumping orders are much more likely to be revoked under Sunset Review than are more recent antidumping orders. Chart 1 shows the share of antidumping orders still in effect in February 2003 as a share of all antidumping orders that originated in a given year. (As noted, a small number of antidumping orders were revoked after Administrative Reviews. But the very large majority of revoked orders were revoked at Sunset.) For example, Chart 1 shows that about 10% of all the antidumping orders that began in 1985 were still in effect in 2003, while more than 90% of the antidumping orders put in place in 1992 were still in place in 2003. The data in Chart 1 show a clear and very interesting trend. Older antidumping orders fail to survive Sunset Review much more frequently than more recent orders.

There are several possible explanations: 1.) One hypothesis is that the effect of an antidumping order on subject imports increases over time. (Perhaps U.S. customers temporarily stick with the product of the foreign firm under the order, hoping that a price hike will be reversed.) If this were true, then older orders might be more likely fully to exclude import competition and thereby make domestic rivals confident that dumping will not resume. 2.) An alternative hypothesis

¹³ My small sample of 32 orders, discussed below, includes 6 cases in which imports ceased altogether.

is that antidumping orders have their exclusionary effect quickly, but that it takes several years after such reduction of imports for domestic rivals to stop worrying about a possible revival of import competition. Only after such anxiety has ended (according to this hypothesis) will the domestic rivals fail to respond to the Federal Register notice of an opportunity to seek continuation of an antidumping order. 3.) A number of outstanding antidumping orders are 30 years old. A third hypothesis might be that for older antidumping orders, the industries or products might have changed enough over time to reduce the concerns of domestic rivals. 4.) A fourth possibility is that antidumping duty levels in the early 1980s might have been different from more recent duties. If, for example, antidumping duties were lower in early 1980 than they have been recently, then perhaps domestic rivals would have less incentive to expend the effort and expense to seek a continuation of these lower duties.¹⁴

Evidence presented below offers some support for Hypotheses 1 and 4. (Hypotheses 2 and 3 might be true, but the available evidence did not allow for an inference.) But the smaller sample of 32 orders that is used to study the relation between duty level and change in import volume is correlated with the universe of antidumping orders in ways (discussed below) that may reduce possible bias problems associated with the selection of the sample.

Continued Orders Compared to All Orders (3): The Level of All U.S. Antidumping Duties Increased Over Time, As Did the Duty Levels for the 32 Orders in the Small Sample

To examine hypothesis 4 first, we can consult Chart 2. Chart 2 shows the initial levels of some antidumping orders put in place each year from 1981 through 1996.¹⁵ The leftmost (blue) bar for each year shows the average of the initial antidumping duties of all dumping orders of the year

¹⁴ The effect could cut the other way. If antidumping duties were, on average, higher in the early 1980s than in recent years, then these higher duties might have effectively extinguished the affected imports from these years, and thereby (in spite of the legal standard cited above) caused a lack of concern among domestic rivals.

¹⁵ Of course, the initial levels can be changed by the administrative review process. But the initial antidumping duty still contains information about how the affected foreign firm(s) must adjust, either through increased U.S. price, or through payment of duty.

in question.¹⁶ The other bars show the initial level of orders that were used in the small sample of 32 observations discussed above and used in the later part of the present paper (i.e. dumping orders with either a single firm or for which all affected firms have the same duty, and for which import data was available in the ITC reports).¹⁷

Chart 2 shows an uneven trend toward increasing levels of antidumping duties over the period 1981-96. The trend is hardly uniform, but the last five years shown in the Chart (1992-1996) contain the five highest average initial antidumping duties (for all antidumping orders) for the period shown. Conversely, the four lowest average initial duties (again, for all dumping orders) were for the first four years of the sample (1981-84). The correlation of the duties included in the smaller sample with the average duty in the full sample for the corresponding years is 0.57—not perfect, but showing an apparent relation.

The reasons for the apparent increase in the level of antidumping duties in the period shown could be the subject of another study. Possible explanations might include movements in the U.S. exchange rate, and changes in the enforcement policy of the U.S. government.

Chart 2 is consistent with Hypothesis 4 discussed above. It is possible that older antidumping orders may be revoked at Sunset Review more often than newer orders because the initial duty levels were lower. But the substantial positive correlation between the duty levels for a given year in the smaller sample used in the study, and the average duty levels for all orders of the given year, reduce concern about possible bias that might arise from use of the smaller sample.

The Sample of Antidumping Orders with One Foreign Firm or All Firms Having the Same Duty

As noted, the 188 antidumping orders that had been continued after Sunset Review by February 2003, include 32 orders with either a single firm, or the same margin for all firms, and with usable import data in the USITC Sunset reports.¹⁸ (For 16 of these 32 cases, information about the

¹⁶ This average was taken from the NBER study assembled by Bruce Blonigen and his associates.

¹⁷ The small sample of 32 orders does not include orders that originated in every year, and the missing years (1988 and 1989) are omitted from Chart 2.

¹⁸ In my sample of 32 observations, I included one case for which information about import volume was available from the Sunset Review reports, and for which Administrative or Sunset Review resulted in a

customs value of the imports--one measure of the price received by the foreign supplier--is also available both before the antidumping order and at the time of the sunset review.) While this sample of 32 orders is a small subset of the continued orders, there is no obvious reason why antidumping orders on products for which all affected producers in the relevant country have the same margin (or for which there was only one exporter) should be different from the universe of continued orders.

Effect of Antidumping Duties on Quantities of Subject Imports

Chart 3 shows one way of looking at these data in the small sample of 32 observations. In Chart 3, the percentage decrease in volume of covered imports is shown as a function of the antidumping duty. The data are striking in showing that, for the most part, the antidumping duties extinguish, or nearly extinguish, the affected imports. As noted, for six of the 32 antidumping orders in the sample, imports ceased completely.¹⁹ In 19 of the 32 antidumping orders for which data are shown, the duty caused imports to decline by at least 94%.²⁰ The average interval between imposition of the antidumping order and measurement of the import volume at sunset review for this sample of 32 orders was 7.8 years.²¹

Older Antidumping Orders May Reduce Volume of Subject Imports More than Recent Orders

Chart 4 shows the same data as Chart 3, with two outliers omitted to make the Chart easier to read. As in Chart 3, the relation between the antidumping duties and change in subject import

reduction in the existing level of antidumping duty.

¹⁹ The fact that these six orders were continued is consistent with the regulations cited above. Presumably there was at least a facially plausible argument that subject imports--and dumping--might resume if the orders were revoked. The de facto standard that orders are revoked if rivals no longer care does not mean that orders are revoked if imports have ceased.

²⁰ Chart 3 shows one case--petroleum wax candles from China-- in which an antidumping duty of 54% was associated with an increase in reported imports of 240%. Perhaps there was a major shift in the U.S. demand for this product.

²¹ The percentage change in imports shown in Chart 3 is, therefore, on average a change over about 8 years.

volume for the sample are shown. In addition, Chart 4 labels each point (representing one order) with the number of years between the order and the sunset review. Chart 4 suggests that not only do high antidumping duties tend to cause large drops in import volume, but age of the antidumping order may also be related to decline in import level. The Chart shows that there were 12 cases in the sample of 32 orders for which the subject import volume dropped by at least 98% between the dumping order and the sunset review. The average age of these 12 orders was 10.6 years, compared to an average age of 7.8 years for the whole sample.

The data discussed in Chart 2 suggest that, for the universe of all antidumping orders, there may have been a trend toward higher duties during the period 1981-96. So the apparent implication of Chart 4—that age of order may be positively associated with decline in import level—is especially interesting. Apparently, in some cases, the ‘age’ effect may be able to trump the ‘level of duty’ effect. Clearly there will be difficulty in disentangling these two influences on import volume.

Results of a Regression Exercise: Age of Order and Level of Duty as Correlated Determinants of Import Levels

The evidence discussed above suggests level of antidumping duty and age of antidumping order as (positively) correlated factors that may account for the decline in import volume following an antidumping order. An ordinary least squares linear regression was employed to attempt to further study the evidence. In the reported regression, the percentage decrease in subject imports is regressed on the level of antidumping duty and on the age of the antidumping order (number of years between the order and the import volume measurement at sunset):

$$\text{(Percentage Decrease in subject imports)} = -0.264 + 0.880 \text{ (AD duty)} + 0.04 \text{ (age of order)}$$

(Standard errors)	(0.428)	(0.041)
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(t- statistics)	(2.05)	(1.41)
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$$R^2 = 0.148$$

These results are interesting, although the modest R² value is a cause for some concern. The result that the elasticity of import volume with respect to Antidumping duty level is about 0.9 is

roughly consistent with the results of both the USITC study (1995), and with work of Blonigen and Haynes (2002). The regression exercise is also consistent with the impression given by Chart 4. The antidumping duties in the sample have had a large impact on import volume—in many cases extinguishing the subject imports entirely. There may also be a (weak) association between age of the antidumping order and percentage decline in import volume. The correlation, discussed above, between the age of the order and the level of the duty make it difficult to definitively disentangle the effects of order age and duty level.

Effects of Antidumping Duties on Prices Received by Suppliers of Subject Imports

Charts 5 and 6 show the available evidence about the effects of the antidumping orders on the price received by the foreign exporters covered by the antidumping orders. As noted, the sample of Sunset Reviews for which both import volume and import price data are available is a subset of the already small sample—only 16 observations. Chart 5 shows these data on prices (customs value) received by the foreign firms plotted against the corresponding antidumping duties. (Chart 6 shows the same data, leaving out two outliers to make the data easier to read.)

The discussion above leads one to expect that the relation between antidumping duties and the price received by the foreign producer is not unambiguous. These data seem consistent with that expectation. In twelve cases of the 16 cases, the price received by the foreign producer was at least 14% higher at sunset than before the antidumping order. But a regression of percentage change in customs value (price) on duty level yielded inconclusive results.

One might wonder whether there is any relation between the changes in import volume between dumping order and sunset review and the change in price received by the exporter. The Diagram shows that imposition of the antidumping duty causes a break in the effective marginal revenue schedule and an effective shift in the demand schedule seen by the foreign firm. So, the relation between quantity and effective price does not trace out a standard demand schedule. Chart 7 shows that for the 16 cases for which both price and import volume data are available, there may

be a weak negative relation between change in import volume after a dumping order and change in price received by the foreign supplier.²²

Conclusion

The large literature on the U.S. antidumping regulations is surprisingly lacking in simple estimates of the effects of these duties on the volume of subject imports. One important reason for this scarcity has been the fact that antidumping duties are firm specific while U.S. import data are reported by country of origin and product, and not by firm. The present study assembles a data set of U.S. antidumping orders for which there was either a single foreign firm or for which all firms from the subject country were assessed the same duty. The sample of antidumping orders for which such data exist is not large—only 32 of about 350 orders put in place during the relevant years. There are a number of questions about the extent to which the antidumping orders in the sample accurately represent the universe of antidumping orders from which the sample is drawn. One concern is that during the period 1981-96, when most of the sample antidumping orders were put in place, there may have been a trend toward increasing level of antidumping duties. The duties of the observations in the sample reflect this trend, however, and the duties in the sample are positively correlated with the average duties of all orders in corresponding years. For the sample, the study found a moderately strong relation between the level of antidumping duty and the percentage decrease in volume of subject imports. The elasticity of import volume with respect to antidumping duty may be on the order of 0.9. The interval between the antidumping order and the Sunset Review at which post duty output volume was measured may also be positively associated with a decline in import volume.

²² A simple linear regression of this relation suggests a possible negative relation between import volume and price received by exporters, but the t-statistic is only about 1.2, suggesting little reason for confidence in the estimate. The small size of the sample may be a factor here.

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