ECONOMIC ANALYSIS GROUP
DISCUSSION PAPER

The Implications of 'Zeroing' on Enforcement of U.S. Antidumping Law

By

William W. Nye*

EAG 08-10 August 2008

---

* Economist, United States Department of Justice. The views expressed are not purported to reflect those of the United States Department of Justice. Ken Heyer, Richard Larm, Russell Pittman and Oliver Richard made helpful comments.

Abstract

The United States and other countries enforce their antidumping regulations in roughly the same way. There is a difference, however. The United States–but not other countries--now uses 'zeroing' in its determination of whether imports are dumped. The use of 'zeroing' will almost always increase the level of any antidumping duty, and will sometimes create a duty where none would have been imposed, had the methodology not been used.

All countries test for dumping by attempting to determine whether imports are being sold at less than 'normal' value. Other countries do this by simply comparing the average price at which the product is sold in the country of production with the average price at which the same product are sold in the importing market. If the average of the observed prices in the importing country is lower than the average price in the country of production (the 'normal' value), then the foreign firm is said to be dumping. Using zeroing, however, the U.S. treats import price observations above the 'normal' value as if they occurred at the 'normal' value (rather than at their observed level). Transactions at prices below the normal value are treated at their observed levels. The result of zeroing has been to make the U.S. antidumping laws more restrictive than they might appear, with a positive antidumping margin potentially being found if any single transaction occurs below 'normal' value, even if the average of the import prices in the U.S. is much higher than the 'normal' value.

The U.S. practice of zeroing has recently been challenged at least six times before the World Trade Organization (WTO), and has generally been found to be inconsistent with the WTO obligations of the United States..

The net impact of the zeroing methodology on the United States (compared to antidumping enforcement without zeroing) depends *inter alia* on the dispersion of the U.S. prices obtained by foreign exporters under dumping investigation. No real estimates of this dispersion exist, but the paper discusses some related evidence which may permit an inference. This evidence is itself quite dispersed, and, therefore, an estimate of the impact and cost of zeroing to the United States has a broad range of uncertainty. But it is plausible that zeroing could add perhaps 3-4 % to the typical U.S. antidumping duty with a cost to the U.S. of around $150 million per year when all existing U.S. antidumping orders were determined by zeroing.

There is a small, but growing literature on the implications of the U.S. antidumping laws for U.S. trade with other countries. (Examples are Blonigen and Park, 2004, Blonigen and Haynes, 2002, Staiger and Wolak, 1994.) U.S. antidumping law makes it illegal for foreign firms to sell their products in the United States at prices below 'normal value'.[1] The economic literature discussing U.S. antidumping generally treats both the home and export prices as single values. But, in fact, the price of most products imported into the U.S. is not homogeneous. For much economic analysis, this dispersion/discrimination in the prices of most products would be a detail of modest importance. But an interpretation of the U.S. antidumping laws, now being challenged at the World Trade Organization, has made the dispersion of U.S. prices of foreign goods a critical part of the U.S. calculation of antidumping margins, and has made the U.S. antidumping laws more protectionist than is sometimes thought. This interpretation of U.S. antidumping law is called 'zeroing'. Using 'zeroing', U.S. Department of Commerce (DOC) officials do not compare the average of price observations in the U.S. to 'normal value' to determine whether dumping has occurred. Instead, DOC officials treat all observations of sales in the U.S. at prices higher than 'normal value' as if they had occurred at normal value. The result of this truncation of the higher end of the distribution of U.S. price observations is to increase the antidumping margin significantly in the case of imported products whose prices in the U.S. are quite dispersed.

I.) Zeroing in the Calculation of U.S. Antidumping Margins

The assessment of U.S. antidumping duties is a complicated process, which will not be fully discussed here.[2] Essentially, though, assessment of an antidumping duty requires both a determination of 'material' injury to the domestic industry by imports (this is done by the U.S. International Trade Commission (USITC)), and a finding that the imports in question have been sold below 'normal' value in the U.S. (This investigation is done by the U.S. Department of Commerce.)

---

[1]U.S. antidumping penalties also require that imports cause 'material injury' to the domestic industry. The United States International Trade Commission determines whether the imports have caused material injury, and the United States Commerce Department determines whether the imports have been sold in the U.S. at less than fair value (LTFV). (Fair value is sometimes referred to as 'normal' value.)

[2]One source for general information about U.S. antidumping enforcement is the U.S. Department of Commerce Antidumping Manual, 1998.

'Normal' value is usually defined as the average of a set of observations of sales of the product in the home (non-U.S.) market.[3] Dumping investigations are done by product and country (for example, all U.S. imports of DRAMS from Japan may be investigated), but duties are specific to individual exporting firms.

After an investigation by the DOC and ITC, an antidumping duty may be imposed on a particular foreign firm. This firm will then need to post a bond equal to this duty when it imports the item into the United States. At the end of each year the duty is in effect, there is an administrative review. It is at this point that the true antidumping duty (the amount that must be paid by the foreign firm) is determined. If, during the review year, the foreign firm facing the duty has raised its export price to the U.S. so that it is no longer selling in the U.S. below 'normal' value, then its bond is fully refunded. If, on the other hand, the foreign firm has lowered its U.S. price during the review year (assuming its home price is constant) then the firm will not only forfeit its bond, but will be assessed an additional U.S. duty.

The U.S. practice of zeroing comes in two forms: 'model' zeroing which may be used in the original investigation stage, and 'simple' zeroing, which is used in annual administrative reviews.[4] Since the review is the stage at which the actual liability of the foreign firm is determined, it is the most important, and will be the subject of most of the discussion of the present paper.[5] In simple zeroing, the DOC compares individual export transactions with the weighted average of home prices

---

[3]However, if the price in the home market is deemed to be below the foreign firm's cost of production, then the U.S. Department of Commerce (USDOC) may use the (average) cost of production as the standard for 'normal' value. If there are insufficient home market sales, the USDOC may use sales in third country markets to determine 'normal' value.

[4] 'Model' zeroing is sometimes referred to as an'average-to-average' comparisons. (These 'averages' are the home and U.S. prices.) The 'simple' zeroing of the administrative review process is sometimes referred to as an 'average-to-transaction' comparison. (The average is of foreign price observations.) A third possibility, normally used only for custom-made products, is 'transaction-to-transaction' comparisons. (U.S. Antidumping Manual, Chapter 6, III A.)

[5]In 'model' zeroing, which may be used in the calculation of initial antidumping margins, the DOC divides the product under investigation into a number of 'models'. The initial antidumping margin for the product under investigation is determined by averaging only the difference between export and home prices for models for which the export price average is below the home price average. [First Written Submission before the World Trade Organization "United States-Measures Relating to Zeroing and Sunset Reviews" WT/DS322, May 9, 2005.] The DOC defines a 'model' as a group of products that is virtually identical in all physical characteristics.

for the exporting firm. In such a calculation, the DOC uses three steps: 1.) The weighted average home price determines the foreign firm's 'normal' value, 2.) All sales in the U.S. (export transactions) at below the 'normal' value are weighted according to their dollar value, and 3.) All U.S. (export) sales transactions at prices above 'normal' value are weighted according to their value, *and treated as if they occurred at 'normal' value*. With this methodology, a single export transaction at a price below normal value will result in a finding at administrative review that the firm is liable for a positive antidumping duty.

Clearly, zeroing will result in antidumping duties that are at least as high as the duties that would obtain if the weighted average home price were simply compared to the weighted average U.S. price. It is also clear that, *ceteris paribus*, the larger the dispersion of the exporting firm's transactions prices in the U.S., the more the antidumping margin with zeroing will exceed what the margin would have been had zeroing not been used (because more transactions will occur above 'normal' value, and be counted as having occurred at the 'normal' value.[6]

II.) Current State of the Dispute Over Zeroing at the World Trade Organization

As noted above, the use of zeroing by the United States when calculating antidumping margins has provoked complaints by U.S. trading partners who claim that it is not consistent with World Trade Organization (WTO) rules for antidumping regimes.[7] The United States has apparently been using some form of zeroing on all antidumping cases for some time. The U.S. has been challenged at the World Trade Organization at least six times with regard to its use of zeroing in antidumping investigations. The Table below shows these seven WTO challenges to U.S. zeroing.

---

[6]Tirole, 1989, notes (p. 133) that "It is hard to come up with a satisfactory definition of price discrimination." Among the reasons for this is the fact that no two transactions are ever fully identical in all respects. Partly for this reason, and partly because the phrase 'price discrimination' has acquired a penumbra of connotations which I do not intend, I sometimes use the looser term 'price dispersion' to mean charging different prices to distinct, but roughly-similarly-situated customers.

[7] The EU appears to have flirted briefly with zeroing in the 1990s. In 1998, India requested that the WTO determine that the EU had acted contrary to its WTO obligations in the case of an antidumping order against cotton-type bed linens from India. After the complaint, the EU recalculated the antidumping margin in this case without the use of zeroing. (This matter is WTO DS141.)

Recent WTO Challenges to the U.S. Use of Zeroing in Antidumping Investigations

Complaining Country	**Product**	**WTO Dispute Resolution Number**
Canada	Softwood Lumber	DS 264
Japan	Ball Bearings	DS 322
EU	U.S. Use of Zeroing in 21 Antidumping Matters	DS 294
Ecuador	Frozen Warmwater Shrimp	DS 335
Thailand	Shrimp	DS 343
Mexico	Stainless Steel	DS 344

The Japanese Ball Bearing matter and the Mexican Stainless Steel matter will be discussed in a bit more detail below. These are probably the most important challenges to the U.S. practice of zeroing among the six listed in the Table, and the Japanese Ball Bearing matter offers interesting data explored below.

II A.) The Japanese Complaint Concerning Ball Barings

On November 24, 2004, Japan sought consultations under the procedures of the World Trade Organization about the zeroing issue and several other matters. Japan complained about zeroing at each stage of a U.S. antidumping investigation–original investigation, periodic review, new shipper review, changed circumstance review, and sunset review. In December, 2004, India, Norway, Argentina, China Taipei, the EU and Mexico joined Japan in the request for consultations. In February, 2005, Japan asked for the establishment of a WTO panel on the matter.[8] On September, 2006, the WTO panel upheld Japan's claim that U.S. zeroing in the original investigation was not

[8]In the World Trade Organization process, a 'panel' is a group selected to adjudicate a dispute. If a party to a dispute disagrees with a panel, it may appeal to the WTO Appellate Body.

consistent with WTO rules, but rejected Japan's claims that zeroing was inconsistent with WTO rules at other stages of the other stages of the U.S. antidumping process listed above–periodic review, new shipper review, changed circumstances review, and sunset review. But on January, 9, 2007, the WTO Appellate Body found that both the U.S. practice of 'model' zeroing at initial investigation level, as well as the U.S. practice of 'simple' zeroing' at the Administrative Review stage were contrary to U.S. WTO obligations.

IIB.) The Mexican Complaint Concerning Stainless Steel

Shortly after Japan's complaint about U.S. antidumping in the ball baring matter, the Mexican complaint about U.S. zeroing in the Mexican Stainless Steel case muddied the legal waters somewhat. In this matter, the WTO panel hearing Mexico's complaint departed from the previous decisions of the WTO Appellate Body (for the most part declaring zeroing to be contrary to WTO rules concerning antidumping), and ruled that, at least in the case of stainless steel from Mexico, the U.S. was not violating its WTO obligations by the use of zeroing.[9] The WTO panel ruled that WTO panels "...are not, strictly speaking, bound by previous Appellate Body or panel decisions that have addressed the same issue." In May, 2008, the WTO Appellate Body reversed the WTO panel with regard to the issue of U.S. zeroing in the Mexican stainless steel case.

On December 20, 2007, the United States Trade Representative hailed the decision of the WTO panel in the stainless matter, and said that it demonstrated "...that WTO rules do not prohibit 'zeroing'."[10] USTR also said that as of February, 2007, the U.S. Department of Commerce had no longer been using zeroing "...in investigations where weighted average calculations are preformed." (i.e, in determinations of preliminary antidumping margins.) Because, as noted above, the Administrative Review stage is where the final liability of importing firm is determined, the significance of this announcement is open to question. The statement by the United States

[9] WT/DS344/R, December, 20, 2007. In the case of the U.S. antidumping order on stainless steel from Mexico, the WTO panel was ruling on the issue of simple zeroing (in the context of Administrative Review.)

[10] United States Trade Representative Web site posting "United States Wins WTO 'Zeroing' Dispute with Mexico", December 20, 2007.

Department of Commerce on December 20, 2007, that "...the issue of 'zeroing' remains very fluid..." seems accurate.

III.) Some Simple Examples of the Consequences of Zeroing in U.S. Antidumping Enforcement

III A.) A Simple Example of the Use of Zeroing

A very simple example may help to clarify the slippery procedure of zeroing in U.S. antidumping enforcement.

Suppose a foreign product is being sold in the U.S. by a foreign firm whose home price is $2. Further suppose that there are three observations of sales by this firm in the U.S., each for one unit of the product, one at $1, one at $2 and one at $3. Consider the calculation of the antidumping margins with and without zeroing.

Case A: No Zeroing

Normal Value: $2

U.S. sales observations: One unit each at $1, $2 and $3.

Average U.S. price: $2 [$2 = ($1 + $2 + $3)/3]

Margin of Dumping: Zero (because the average U.S. price equals the normal value.)

Case B: Zeroing

Normal Value: $2

U.S. sales observations: One unit each at $1, $2 and $3

Average U.S. price with zeroing: $1.66 [$1.66 = ($1 + $2 + $2)/3] (The third U.S. sales price observation, at $3, is adjusted to the normal value of $2, since the U.S. sales price observation exceeds the normal value.)

Margin of Dumping: 19.8% [19.8% = ($2 - $1.66)/$1.66]

III B.) A Simple Algebraic Expression of the Difference Between the Antidumping Duty With and Without Zeroing

Suppose that a foreign firm has been assessed an initial U.S. antidumping duty, that the foreign firm's weighted average price in its home market (normal value) is μ_H, and that its weighted average price in the U.S. is μ_F . Then the U.S. antidumping duty without zeroing is:

(1) $AD_{NZ} = (\mu_H - \mu_F)/\mu_F$

If the firm's U.S. antidumping duty is determined with simple zeroing, it can be viewed as:

(2) $AD_Z = (\mu_H - \mu_F^Z)/\mu_F^Z$

The term μ_F^Z , a construction of the author's, represents the average export (U.S.) price as it is computed with the zeroing methodology. This term–really an intermediate step in the computation of the term of real interest, the antidumping duty with simple zeroing–is useful because it offers intuition for the relation between the dumping calculation with and without zeroing. It is clear that μ_F^Z depends, *inter alia*, on how the transactions price observations in the U.S. are distributed.[11]

III C.) Simple Numerical Illustration of the Average U.S. Price Computed With and Without

[11] For example, if transactions prices in the U.S. market are uniformly distributed, and the difference between the highest and lowest price observation is D, then the weighted average U.S. price with zeroing is: $\mu_F^Z = \mu_H \{1/D[(\mu_F + D/2) - \mu_H]\} + \{(\mu_F - D/2) + [\mu_H - (\mu_F - D/2)\}/2\}\{1/D[\mu_H - (\mu_F - D/2)]\}]$

Zeroing and the Antidumping Duty With and Without Zeroing

Charts 2 illustrates the relation between the antidumping duty with and without zeroing as the mean U.S. price changes for the simple case where normal value is 1.0, and U.S. price observations are uniformly distributed with a range of one. Chart 1 shows the relation between the mean U.S. price and the 'mean U.S. price with zeroing' under the same assumptions.[12]

With normal value of one, and U.S. price observations distributed uniformly with a range of one about a mean U.S. price of 0.5, all observations of U.S. price are below Normal Value (which is one). In this case, Chart 1 shows that the average U.S. price with or without zeroing is 0.5. Zeroing makes no difference, in this case, because all U.S. price observations are below normal value. Chart 2 shows that in this case, the antidumping duty with or without zeroing is 0.5 (50%).

Suppose the normal value is again one, and the U.S. price observations are again distributed uniformly with range one, but this time about a mean U.S. price of one. In this case, zeroing does make a difference. Since the mean U.S. price is the same as the normal value (one), there is no dumping if zeroing is not used. Chart 1 shows that in this case, when the mean U.S. price is one without zeroing, the average or the U.S. price observations with zeroing is 0.875. This is because half the U.S. price observations (all the ones over one) are treated as if they were one. The other half of U.S. price observations, uniformly distributed from 0.5 to 1.0 have an average of 0.75. Chart 2 shows that in this case, the antidumping margin without zeroing is zero, and with zeroing is 0.125 (because normal value is 1.0 and the average of the U.S. price observations with zeroing is 0.875.)

The observations on the right hand side of Chart 2, representing larger antidumping duties without zeroing, show the antidumping duties under the two approaches becoming almost equal for large antidumping duties. (The graph asymptotically approaches an a 45 degree ray from the origin.) This occurs because higher antidumping duties without zeroing imply that the mean U.S. price is declining relative to the mean foreign price (the normal value.) As this occurs, the antidumping duties with and without zeroing resemble each other more closely, since (with a given dispersion of U.S. price observations) more of the U.S. price observations will be shifted into the dumped range

[12]As noted above, the 'mean U.S. price with zeroing' is a construction useful in understanding the zeroing procedure.

(less than normal value).

IIIC.) Calculating Antidumping Margins With and Without Zeroing: The Case of Given Normal Value and Different Variances of U.S. Price Observations about a Given Mean U.S. Price

Diagrams A and B illustrate two cases in which normal value is one and the mean of U.S. price observations is also one. For this reason, the antidumping duty without zeroing is zero in both cases. The antidumping duties calculated with zeroing are quite different, however, because the variances of the U.S. price observations are much larger in Diagram B than in Diagram A. With zeroing, all U.S. price observations above the normal value are counted as if they occurred at the normal value, but the observations below normal value are treated as they occur. Clearly, the use of zeroing will produce a lower constructed average U.S. price, and, therefore, a larger dumping duty.

Chart 3 makes this same point by ploting the Antidumping duty computed with zeroing against variance of U.S. price observations, with the U.S. price observations uniformly distributed. Chart 3 illustrates the important point that the antidumping duty with zeroing increases, *certeris paribus*, with the variance of the observations of U.S. price observations. This is because : A.) It the mean U.S. price is above normal value (no dumping without zeroing), a higher variance of U.S. price observations means a higher share of U.S. price observations below normal value, and B.) If the mean U.S. price is below normal value (dumping without zeroing), higher variance of U.S. prices means a larger share of U.S. price observations above normal value (and, therefore, a share of the U.S. price distribution truncated–and the average with zeroing reduced.)[13]

IV.) U.S. Antidumping Duties on Ball Bearings from Japan Computed With and Without Zeroing

As noted in Section II above, the United States and Japan were recently engaged in a dispute,

[13] The fact that the antidumping duties in Chart 3 approach an asymptote of 1/3 (=33% antidumping duty) occurs because of the uniform distribution of US. prices and the restriction that no U.S. price observation can be less than zero.

under the auspices of the WTO, concerning the use of zeroing by the U.S. in an antidumping proceeding involving the import of 22 types of ball bearings from Japan. The Government of Japan, acting for the Japanese machine tool builders, submitted information about 21 of these 22 varieties that shows the antidumping margins found by the United States Department of Commerce (using zeroing), as well as a calculation of what the Japanese manufacturers believe the duties would have been, had zeroing not been used.[14] In Chart 4, the values of the antidumping duties with zeroing, and their purported values without zeroing are plotted against each other. The data plotted in Chart 4 combines observations on four varieties of bearings–ball bearings, tapered roller bearing, cylindrical roller bearings, and spherical plain bearings–from four firms.

Chart 4 shows that in 19 of 21 cases, the Japanese Government claims that the U.S. antidumping would have been negative (i.e. no duty would have been imposed) had zeroing not been used. (In the other two cases, the report claims the duties would have been positive, but lower, had zeroing not been used.) It is striking that the relation, shown in Chart 4, between the antidumping duties (with zeroing) for Japanese ball bearings plotted against the asserted values of what the duties would have been had zeroing not been used, resemble the expected pattern shown in Chart 2.

A linear regression of the duties on the 21 varieties of bearings for which data are available with and without zeroing (according to the methodology of the Japanese complaint) has the following result:

(Antidumping Duty with Zeroing) = 12.5 + 0.33(Antidumping Duty without zeroing)

t = 5.85

$R^2 = 0.62$

This regression exercise is, for a number of reasons, only suggestive. As noted, the data combine information about duties on what are really several distinct products made by four different firms. And the relationship between the antidumping duty with and without zeroing is probably not linear. It is interesting that in both Chart 4--showing the relation between the antidumping duties

[14]WT/DS322/1, G/L/720, G/ADP/D58/1 29 November, 2004, (04-5181) I am not aware of how the Japanese estimates of the duties without zeroing were computed.

with and without zeroing in the Japanese ball bearing case--and Chart 2–showing antidumping duties with and without zeroing for a hypothetical case of uniform distribution of U.S. price observations--the y-intercept of each graph (of the antidumping duty with zeroing on the duty without it) is about 0.12 (12%). The similarities between the historical evidence in Chart 4 and the hypothetical example shown in Chart 2 suggest that the description of the effect of zeroing sketched above may not be far from the mark.

V.) Evidence of the Extent of Price Discrimination or Price Dispersion in U.S. Imports

Section III above suggests why the level of U.S. antidumping duties with zeroing depends crucially on the extent of price dispersion in U.S. import prices of the relevant products. There is a surprising lack of empirical literature about the extent of price discrimination/dispersion generally, and a near total lack of empirical work about price discrimination in the context of U.S. import prices. The WTO complaint of the Japanese Machine Tool builders may be the best source in this regard, but several other studies are cited below.

V A.) The Extent of Dispersion of U.S. Import Prices Implied by the Data in the WTO Complaint by the Japanese Machine Tool Builders

As discussed above, Chart 4 shows calculations by the Japanese Machine Tool Builders for 21 types of ball bearings of both the historical U.S. antidumping duty (using zeroing), as well as an estimate of what the U.S. antidumping duty would have been, had the U.S. zeroing methodology not been used. Clearly, the difference between the estimates in each of these twenty one pairs (the historical estimate in which zeroing was used and the counterfactual estimate in which it was not) was largely due to the dispersion of price observations for sales in the U.S.[15] Using these twenty one pairs of estimates, it is possible to make a rough inference about the extent of dispersion in the prices at which these Japanese bearings were sold in the U.S.

[15]If all sales of a given type of bearing in the U.S. had been made at the same U.S. price, then the U.S. antidumping duty with zeroing would have been the same as the duty without zeroing.

I decided to make the simplest possible assumption about the distribution of U.S. prices charged by the Japanese exporter that would generate each pair of observations (antidumping duty with and without zeroing) for each product. I assumed that each pair of observations (a dumping duty with and without zeroing) were generated by only two distinct sales of the product in the United States, and that these sales were of equal dollar value. In addition, I assumed that these two observations were drawn from a probability density function characterized by a uniform distribution. Using these assumptions, an estimate for the coefficient of variation of each observation was generated (using the antidumping duty without zeroing as the mean). Finally, the arithmetic average of the 21 coefficients of variation computed in this way was determined.[16] The average of these 21 coefficients of variation was 0.18.

V B.) The Extent of Dispersion of U.S. Import Prices Implied by A Recent Study of Price Discrimination in German Exports

The price-to-market international trade literature may also shed indirect light on the extent to which individual foreign firms price discriminate in the sale of a given products sold to the U.S. The price-to-market literature generally investigates the extent to which exporters discriminate in price with regard to export sales to different countries. One goal of these investigations is to learn about the effect of exchange rate movements on export prices. But the literature also has implications for the extent of international price discrimination. Of course, this literature is not perfectly aligned with the present goal, since it examines, for example, the export price (in marks) of cars that are made in Germany and sold in the United States versus the same cars made in Germany and sold in Australia. But the implications of this literature may still be of some interest from the current perspective. Examples are Knetter, 1989, Gagnon and Knetter, 1992, and Knetter, 1993.

The first of the three papers cited is a very interesting study by Michael Knetter of price discrimination by U.S. and German exporters across export markets. [Knetter, 1989] Ten German export products are studied, and estimates of the effect of exchange rate changes in a number of

[16]Since the import volume of each product was not available, taking a simple average–rather than weighting by volume of commerce--makes a virtue of necessity. But if the duty for each product is viewed as a single experiment in a larger process, it is not clear that such weighting is even desirable.

destination markets on the price (in marks) of these exports are made.[17] Using Knetter's estimates, it is possible to infer the extent of price discrimination for these products across destination country markets. As noted, this is not precisely the sort of price discrimination under study in the present paper. Knetter's results examine price discrimination across countries, rather than across individual customers in a given country, which is the goal here.

For six of the ten German export products studied by Knetter–fan belts, titanium dioxide pigment, small cars, beer, white wine, and sparkling wine–I computed the coefficient of variation of the exports, treating each country destination as an equal-volume single export transaction.[18] Using this rough approach on these data results in a average coefficient of variation of German export price for these products of 1.15. The fact that this coefficient of variation is much larger than the coefficient reported in the case of the Japanese Machine Tool Builders case is not surprising. Price dispersion within a single country, as in the machine tool case, will almost always be substantially less than dispersion across countries, where arbitrage is difficult, and where different exchange rates can play a role.

V C.) The Extent of Dispersion of U.S. Import Prices Suggested by a Study of of Price Dispersion In Homogeneous Retail Products In Israel: The Lach Study

The most unlikely environment for finding an example of price dispersion would be the price of a homogeneous product in a single geographic region. If significant price dispersion can exist under these circumstances, then one might suspect such dispersion could be quite high in settings such as the price of imported goods subject to antidumping duties. Theorists have pointed out that if the price of a homogeneous product is to remain dispersed over time, it must be because consumers cannot easily learn which store is selling the good for the lowest price. [For example, see Varian, 1980]. But how often does this occur? In one of the very few available studies, Lach examined the

[17]Data in the Knetter study covers German exports of each of the ten products to between five and eight destination markets.

[18]I omitted four of the ten German export products in the Knetter study because the relevant mean of the export prices would have been so small that the interpretation of the coefficient of variation would have been difficult.

price dispersion of four homogeneous products–refrigerators, chickens, coffee, and flour–in stores in Israel.[19] Lach found the following coefficients of variation for monthly prices of these products[20]:

Dispersion of Prices for Selected Products in Israel

Product	Mean Price[21] (standard deviation)	Coefficient of Variation of price
Refrigerator	3170 (153.9)	.0485
Chicken (size 1)	9.69 (1.10)	.1155
Chicken (size 2)	9.92(1.18)	.1189
Coffee	11.85 (2.33)	.1966
Flour	1.55 (0.21)	.1335

Because the Lach study examined homogeneous products within a fairly narrow geographic market, it probably sets a lower bound for the variation of transactions prices that may be expected for import prices.

VI.) How Much Does Zeroing Increase U.S. Antidumping Duties?

VI A.) The Historical Dispersion of U.S. Import Prices

The arithmetical exercise presented in Section III above and illustrated in Charts 1 and 2 shows that the use of zeroing by the U.S. can be expected to increase calculated antidumping margins

[19]The refrigerator, the coffee and the flour were exactly the same in terms of physical attributes in this study.

[20] Lach found that the position of individual stores in the rankings of relative prices changed enough over the months reported that it was plausible that customers could not readily determine where to get the lowest price.

[21]Prices are in NIS

above what the margins would have been, had zeroing not been used. The exercise also shows that the extent of the increase in calculated antidumping margin caused by the use of zeroing depends importantly on the extent to which the prices of sales in the U. S. by the foreign firm are dispersed. A larger dispersion of prices implies (other things equal) a larger difference between the duty computed with and without zeroing.

In Section V above, a rough inference of the relevant price dispersion is attempted using the complaint of the Japanese machine tool builders, as well as the price-to-market literature, such as the Knetter study, and the Lach paper. The complaint of the Japanese machine tool builders suggest a coefficient of variation of U.S. prices by the Japanese ball bearing producers in the range of 0.18. The average coefficient of variation of the five products in Lach''s sample is 0.121. On the other hand, the coefficient of variation of prices (across destination countries) in the Knetter study of pricing-to-market is in the neighborhood of 1.15.

VI B.) The Frequency, Level and Cost of U.S. Antidumping Duties

In 2003, there were 359 outstanding U.S. antidumping orders. Between 1980 and 1995, about 21 new U.S. antidumping orders were put in place each year.[22] From 1995-1999, an average of 26 new antidumping investigations were initiated, and about 16 new antidumping orders put in place each year. According to a CBO study, the U.S. had 267 antidumping orders in effect in 1999, with an average duty being 47.6%. The average duration of a U.S. antidumping order imposed after the U.S. adoption of the 1995 Uruguay Round Agreements was about 8 years.[23]

Several justifications of antidumping laws have been offered–protection from foreign predation, and exploitation of optimal tariff opportunities chief among them. But many observers

[22]Both of these figures are from the NBER data set on U.S. antidumping duties assembled by Bruce Blonigen and his associates.

[23]CBO Study, Table 2. If an average of 16.4 new antidumping orders are put in place each year, and if each order lasts, on average, 8.2 years (the mean lifetime of post Uruguay Round orders, according to the CBO study), then there would be only about half as many outstanding dumping orders as in fact exist. (134, rather than 267) Clearly, the older antidumping orders are proving more durable than the more recent orders.

remain convinced that these duties should be viewed as simple import protection.[24] A study by Gallaway, Blonigen and Flynn indicates that in 1999, U.S. antidumping or countervailing duties covered around $24.2 billion of U.S. imports, and imposed a welfare cost to the U.S. of around $3.95 billion.[25] [Gallaway, Blonigen and Flynn, 1999] If antidumping duties were half of all these duties and were the same average size as countervailing duties, then antidumping duties covered U.S. imports of around $12 billion with a welfare cost of almost $ 2 billion.[26]

VI C.) The Cost of Zeroing

VI C I.) The Lower Bound of the Cost of Zeroing to the U.S.

As noted, the Lach study cited above seems to establish a probable lower bound for the likely dispersion of the U.S. prices of products subject to antidumping orders. If the prices of U.S. imports subject to antidumping duties are dispersed as in the Lach study–with a coefficient of variation of 0.121, and if these U.S. price observations are uniformly distributed, then the use of zeroing might account for about 2.5 percentage points of the total 47.6% average U.S. antidumping duty. If the Gallaway, Blonigen and Flynn estimates of the costs of U.S. antidumping regulations are correct, then this 2.5 percentage point share might amount to an annual welfare cost to the U.S. in the range of $105 million. If, on the other hand, the prices of U.S. imports subject to antidumping duty have

[24] Although predation is a possibility, many observers have doubts about its frequency–see, for example, Kobayashi (forthcoming.) And even if foreign predation were a significant threat, regulations such as the antidumping laws might be a very expensive way to combat it, because duties might be imposed in cases where no predation was occurring. The optimal tariff argument is that a large country such as the U.S. should take advantage of any monopsony power it has in the purchase of imports. Again, it is unclear that antidumping regulations are a sensible way of exploiting any such power.

[25] Studies such as those of Galloway, Blonigen and Flynn take the gains of U.S. firms benefitting from import protection into account. But these studies generally find the losses to U.S. consumers to be larger than the gains.

[26]U.S. antidumping duties are far more numerous than U.S. countervailing duties, so I believe it is very likely that antidumping duties account for far more than half the totals cited in the study by Gallaway, Blonigen and Flynn. But data summarizing the volume of imports covered by antidumping duties could not easily be located.

a coefficient of variation of 0.121, as in the Lach study, but the import prices are normally distributed, then the use of zeroing might account for only about 0.7 percentage points of the typical U.S. antidumping duty with a much smaller cost–in the range of $30 million/year.[27]

VI C ii.) The More Likely Cost of Zeroing to the U.S.

The Japanese machine tool builders complaint is the only estimates of the dispersion of U.S. import prices that is actually derived from a set of such prices. As such, it may be the most accurate of the three estimates. Price dispersion in the Japanese machine tool builders case–obtained above on the assumption that the distribution of the import prices is uniform–had a coefficient of variation of 0.18. This is larger than the estimate from the Lach study, but, as expected, much smaller than the cross-country estimate from the price-to-market studies. The coefficient of variation discussed above from the ball bearing case–0.18–suggests that zeroing might account for about 3.7 percentage points of the average U.S. dumping duty of about 47.6%. If this is accurate, then the annual welfare cost of zeroing to the U.S. might be a bit above $150 million/year in this case. And, or course, if the dispersion of import prices approaches the range in the price-to-market studies, then the cost of zeroing could be far higher.

[27]Observations in a normal distribution are concentrated more closely around the mean than is the case of a uniform distribution with the same mean and standard deviation. And larger dispersion around the mean implies a greater impact of zeroing.

References

Blonigen, Bruce, and Haynes, Stephen, "Antidumping Investigations and the Pass-Through of Antidumping Duties and Exchange Rates", *American Economic Review*, Volume 92, No. 4, September, 2002, pp. 1044-1061.

Blonigen, Bruce, and Park, Jee-Hyeong, "Dynamic Pricing in the Presence of Antidumping Policy: Theory and Evidence" *American Economic Review*, Vol. 94, No. 1, March, 2004, pp.134-154.

Business Alert-U.S., "Democrats Urge Administration to Take Measures to Reduce Trade Deficit", Issue 05 March 1, 2007.

Gagnon, Joseph, and Knetter, Michael, "Markup Adjustment and Exchange Rate Fluctuations: Evidence from Panel Data on Automobile Exports", NBER Working Paper No. 4123, July, 1992.

Kobayashi, Bruce, "George Mason University Law and Economics Research Paper, 08-41", forthcoming in *Antitrust Law and Economics*, Edward Elgar Publishing, Keith Hylton, ed.

Knetter, Michael, "Price Discrimination by U.S. and German Exporters", *American Economic Review*, Vol. 79, No. 1, March, 1989, pp. 198-210.

Knetter, Michael, "International Comparisons of Pricing-to-Market Behavior", *American Economic Review*, Vol. 83, No. 3, June, 1993, pp. 473-486.

Lach, Saul, "Evidence and Persistence of Price Dispersion: An Empirical Analysis". NBER Working Paper, No. 8737, January, 2002.

Staiger, Robert, and Wolak, Frank, "Measuring Industry-Specific Protection: Antidumping in the United States", *Brookings Papers on Economic Activity, Microeconomics*, 1004, pp. 51-118.

Tirole, Jean, *The Theory of Industrial Organization*, The MIT Press, Cambridge, Massachusetts, 1989.

United States Department of Commerce Antidumping Manual, 1998.

Varian, Hal, "A Model of Sales", *American Economic Review*, Vol. 70, 1980, pp. 651-659.

WTO.org (World Trade Organization Web Site), for Disputes DS322 (U.S./Japan, Ball Bearings), DS344 (U.S./Mexico, stainless Steel)

Chart1

Average Price in U.S. With Zeroing [U(Fz)] as a Function of Average U.S. Price Without Zeroing [U(F)] with Uniform Distribution of U.S. Price Observations Over Range of One

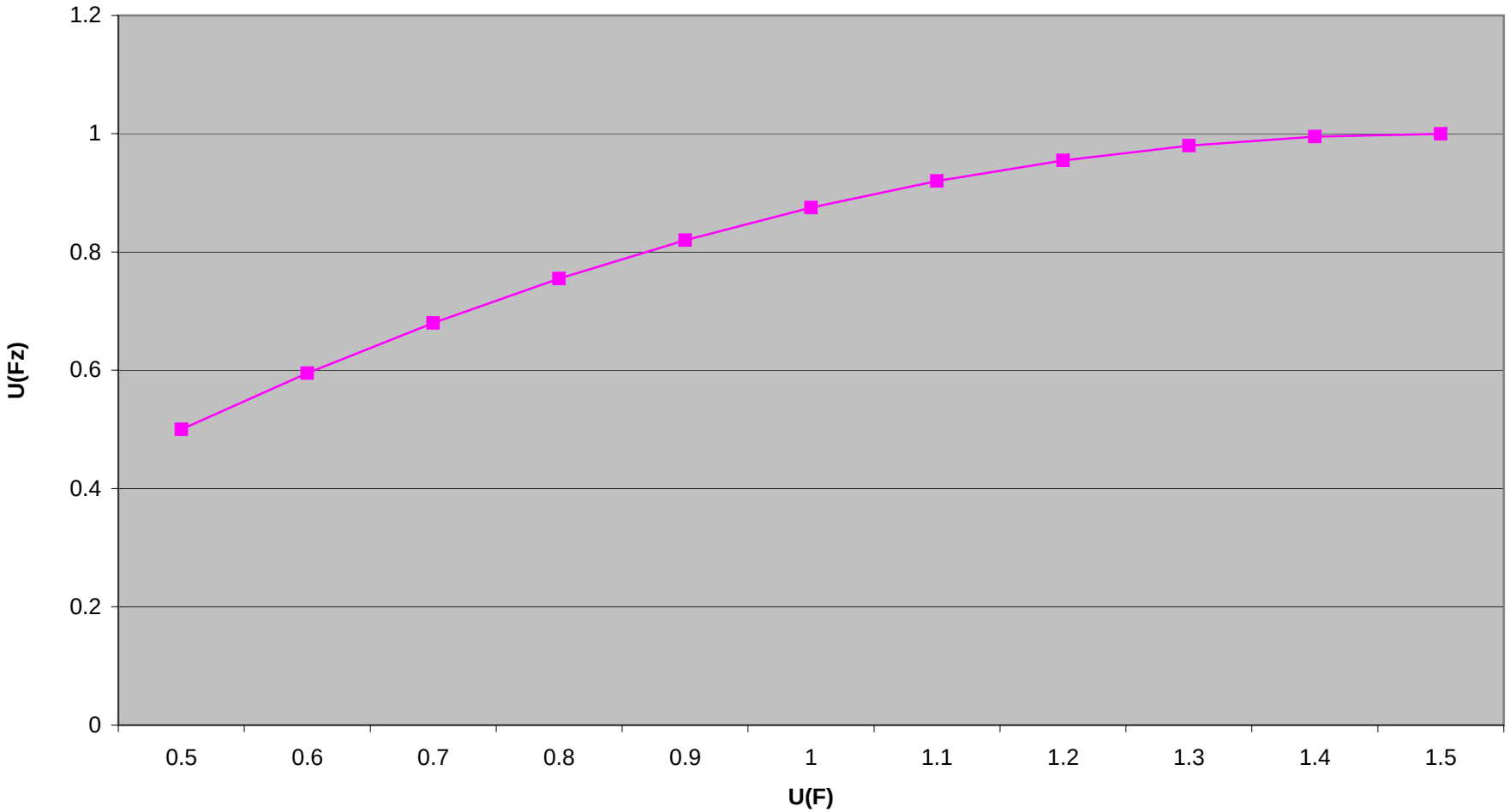


Chart 2

Anti-Dumping Duty with Zeroing [AD(Zeroing)] as a Function of Anti-Dumping without Zeroing [AD(No Zeroing)] with Uniform Distribution of U.S. Price Observations with Range of One [AD=0.2 indicates an antidumping duty of 20%]

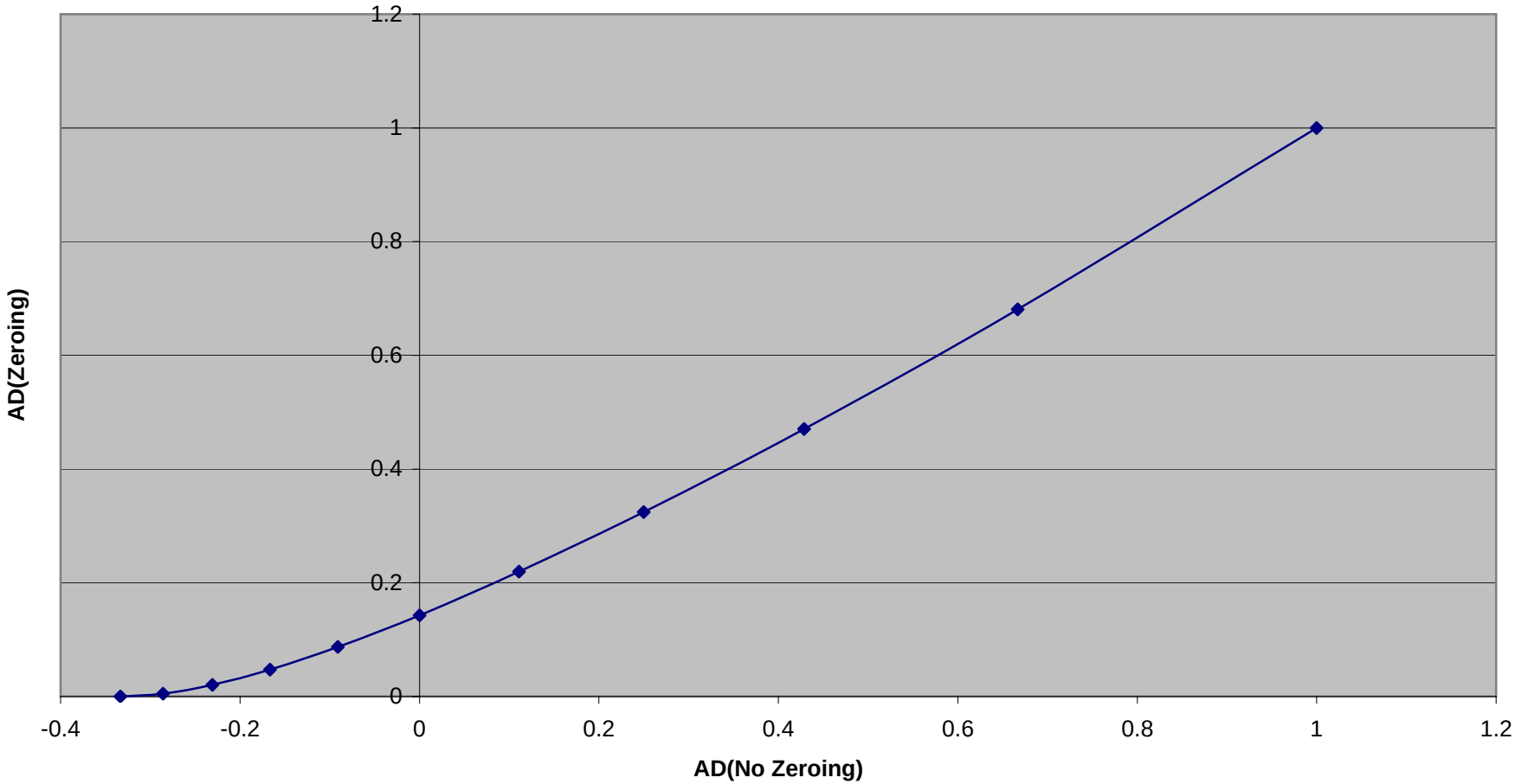
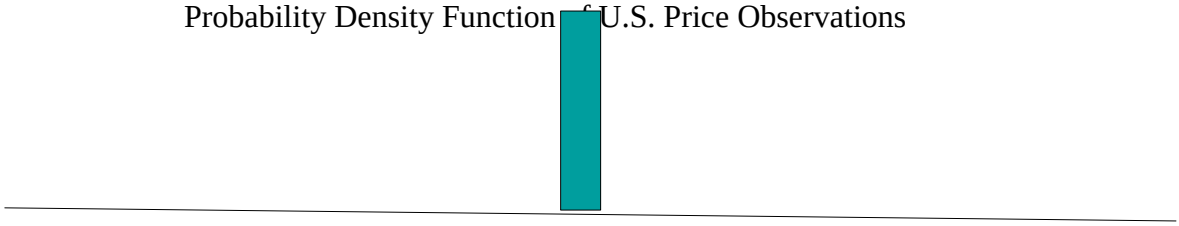


Diagram A

Probability Density Function of U.S. Price Observations



0 1

(Normal Value = 1.)

Diagram B

Probability Density Function of U.S. Price Observations

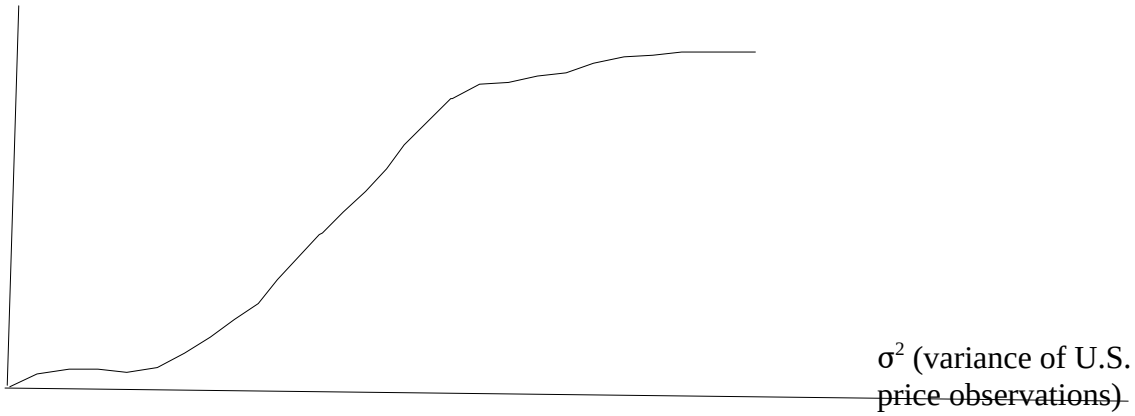
0 1 U.S. Price

(Normal Value = μ_H)

Chart 3

$AD_Z = 1/3$

AD_Z



σ^2 (variance of U.S. price observations)

Chart 4

U.S. Antidumping Duties with Zeroing on 22 Varieties of Ball Bearings from Japan as a Function of what the Antidumping Duties on the same products would have been without Zeroing