Do U.S. Agricultural Antidumping and Countervailing Duties Result in Trade Diversion?

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I. Introduction

The reduction of traditional trade barriers and the recent high growth in U.S. food imports has precipitated a growing interest in antidumping (AD) and countervailing duty (CVD) laws in the United States. Originally designed to protect domestic firms against unfair trade such as price discrimination and below-cost-sales, increasingly trade remedy laws have become an issue of international disaccord (Stiglitz). While the application of these laws is in compliance with the WTO, there is often a lack of economic evidence to substantiate price discrimination. The level of protection afforded by AD and CVD laws can also be significant. This has led many developing nations to view trade remedy laws in the developed world as hidden protectionism. used predominantly to suppress import competition rather than to deal with unfair trade practices (Blonigen and Prusa). The proliferation of trade disputes and the continued frequent use of these laws undermine the trade liberalizing objectives of the World Trade Organization (WTO) and of regional trade agreements.

The literature on trade remedy law has typically focused on the manufacturing sector, not agriculture. From that literature two interesting results have emerged. First, the mere initiation of an unfair trade investigation reduces imports from the targeted country. Prusa (1992) and Staiger and Wolak refer to this as an "investigation effect". They determined that the value of manufactured imports from countries named in a suit typically falls about 20% even if no AD or CVD import tariff is imposed. This phenomenon creates an incentive for domestic firms to increase sales in their home market by initiating an AD or CVD case against a foreign competitor even if they do not anticipate winning the case. Second, the extent of protection afforded to

domestic producers by AD or CV duties is mitigated by a "trade diversion effect". Trade diversion occurs when a trade remedy action diverts imports away from a low cost exporter targeted by the AD or CVD action, toward a higher cost exporter that is not named in the trade action. Prusa studied all U.S. AD actions against manufactured products between 1980 and 1988 and found that trade diversion was a significant by-product of AD cases. Indeed, some exporting countries may have actually gained (on net) from U.S. AD duties. For example, over the time period covered in his study, Prusa (1997) estimated that both Canada and Mexico enjoyed a net gain of over $21 billion as a result of U.S. AD and CVD duties levied on other countries.

The purpose of this paper is to measure the trade diversion effects with respect to AD and CVD laws initiated by U.S. producers against agricultural imports. Agriculture is of particular interest because of the special concessions it has received, and continues to receive, in international trade negotiations. Traditional trade barriers such as quotas and tariffs are being disciplined in the WTO. This progress on trade liberalization is being undermined, however, as OECD countries have found other means of protecting their domestic farmers. The increased use of trade remedy law is one prominent example of an alternative mechanism for protection.

Unlike manufacturing, agriculture is characterized by a large number of small producers and supply is vulnerable to weather, diseases and pests. Agricultural products are, by and large, homogeneous regardless of the country in which they are produced. This feature allows numerous countries to trade agricultural commodities whose physical characteristics are identical to the consumer. Another quality of agriculture that is distinct from manufacturing is the lack of control over timing and volume of output. Substantial price volatility in agricultural markets often leads to higher AD margins, particularly when the product is highly perishable (Blonigen). Because of the unique factors that influence agricultural production and trade, an analysis of

trade diversion effects specific to this sector is worthwhile. The initiation of an AD or CVD cases against an agricultural good may not precipitate the same reaction as in the manufacturing industry. While trade theory leads us to expect a significant drop in exports by countries implicated in a trade dispute, product perishability may limit the extent named countries react to an agricultural tariff if alternative markets do not exist. The degree of trade diversion may also be muted since production decisions are controlled by the climate, resource endowments and agronomics. For many food products, non-named countries may be unable to ramp up production because the lack the necessary climate, soil conditions, etc. In developing countries, agricultural production is largely based on traditional markets, with adjustments to crop production occurring gradually. In the short run the supply elasticity is therefore low for most agricultural products. This limits how much non-named countries may redirect output from other export markets to the complainant country. Furthermore, sanitary and phytosanitary considerations often prevent non-traditional (and non-named) exporters from quickly entering new markets. For the above reasons, we might expect a markedly different trade diversion result for agriculture compared to manufacturing. A low degree of trade diversion would render trade remedy laws more effective for agriculture.

II. U.S. Trade Remedy Law

There are three distinct components of U.S. trade remedy law: AD, CVD, and safeguards, otherwise known as administered protection. The stated purpose of AD and CVD legislation respectively is to offset "unfair" trade that injures domestic producers as a result of either foreign sales that are "dumped" into the United States at less than fair value (LTFV) or that are influenced by foreign government subsidies. Sales at LTFV are considered “dumped” when the

goods are sold in the United States either below the exporting country's cost of production, or below the price of comparable goods sold in the exporter's home market or in third markets. Import relief laws, commonly known as "safeguards", do not require evidence of injury, and are intended to provide a temporary period of relief and adjustment for an industry facing import surges.[1] If foreign exporters are found guilty of dumping into the U.S. market, or if exporting countries are found to be subsidizing the production or export of the commodity in question, and if those exports are found to injure (or threaten to injure) U.S. producers, then an AD or CV duty is applied.

III. Use of Trade Remedy Laws in U.S. Agriculture

Between January 1980 and December 2003, a total of 1,329 AD and CVD cases were filed in the United States, of which 97 cases (or 7.3%)[2] involved agricultural products (USDOC). This means that U.S. agriculture's share of all U.S. trade remedy cases was greater than agriculture's share of the total value of U.S. merchandise imports over this period, which is approximately five percent (U.S. Census Bureau).

The outcomes of U.S. AD and CVD agricultural cases between 1980 and 2003 are reported in table 1. AD cases are slightly more popular than CVD cases in the United States, where 58% of the agricultural cases were AD. The total number of trade disputes is heavily influenced by cases that were both AD and CVD cases, a popular strategy aimed at improving

[1] For the remainder of this paper we do not deal with safeguards cases since they are not designed to address unfair trade and applied duties only remain in place for a fixed period, providing temporary relief.

[2] The United States assigns a case number for each of the country/commodity combinations being investigated. The case numbers also vary depending on the type of case i.e., AD or CVD. Since the trade practices of each country must be examined separately, the investigations for dumping or subsidies are distinct for each exporting country. The rulings for each of the targeted countries and each type of case may vary, so we count each case for which there is a case number. For example, the 1995 AD and CVD cases against imports of pasta from Italy and Turkey are counted as 4 cases: 2 AD and 2 CVD. This approach is consistent with the USDOC, International Trade Administration's AD/CVD Statistics (2004).

the chances of an affirmative ruling. Joint AD/CVD cases include the fresh cut flowers case, which was initiated against 7 countries, and table wine, which was initiated twice against France and Italy as both an AD and a CVD case. Even when all joint AD and CVD cases are removed from the list, however, AD suits still comprise 59% of the remaining 56 cases.[3] The agricultural AD cases resulted in duties 52% of the time, approximately equal to the world average for "successful" AD cases (Blonigen).

In the United States, CVD cases resulted in duties only about 43% of time. Since 1979, reforms to the U.S. AD legislation have increased the probability that AD duties will be imposed, perhaps explaining why AD cases are more popular. These reforms included amendments to the methods by which duties are calculated and the ability of the domestic industry to implicate several countries in one suit so that the combined effect of their imports on the domestic industry is assessed.

IV. Estimation

a. Theoretical Model

Following Bown and Crowley, we employ a theoretical model of worldwide trade in which the imposition of an import duty by one country causes distortions in world trade flows. Bown and Crowley assume three countries, indexed by i or $j \in \{A, B, C\}, i \neq j$. Each country has one firm, also indexed i or j, which produces a single good for domestic consumption and for export. A good is denoted m_{ij}, where the first index, *i*, indicates the country of production, and the second index, j, indicates the country in which the good is consumed. Output produced for domestic

[3] Joint-AD/CVD cases include lamb (1984), table wine (1984, 1985), in-shell pistachios (1985), fresh cut flowers (1986), Atlantic salmon (1990), pasta (1995), Danish butter cookies (1998), live cattle (1998, Canada), Honey (2000, Argentina), HRS Wheat (2002).

consumption is denoted $m_{ii.}$ Firms are assumed to compete in quantity, and the good produced for domestic consumption and the imported goods are strategic substitutes $\left(\pi_{m_{ii}m_{ji}} < \pi_{m_{ji}m_{-ji}} < 0\right)$.

Bown and Crowley assume that technology is identical across countries and that the marginal cost of production is increasing. The cost function is denoted as $c(x_i)$ where $c'(x_i) > 0$ and $c''(x_i) > 0$. Firm i's total output, x_i, is the sum of domestic sales and sales in the two foreign markets, $x_i = \sum_j m_{ij}$, $j \in \{A, B, C\}$.

Inverse demand in all countries is given by $p(Q_i, Y_i)$ where Q_i is the total output sold in country i and Y_i is national income. Total output sold in i is the sum of domestic sales by domestic firm and imports from the other two countries, $Q_i = \sum m_{ji}$, $j \in \{A, B, C\}$. The objective of the firm in i is to choose a total output level and a level of sales for each market in order to maximize profits while taking into consideration any import tariffs, τ_{ij} , by country j such that,

$$\max_{m_{ij}} \pi_i = \sum_j \left[p(Q_j)m_{ij} - \tau_{ij}m_{ij}\right] - c(x_i). \tag{1}$$

The firms' first order conditions are given by the following:

$$\frac{\partial \pi_i}{\partial m_{ij}} = p(Q_j) + p'(Q_j)m_{ij} - \tau_{ij} - c'(x_i) = 0. \tag{2}$$

The solutions to the first order conditions for each $j \in \{A, B, C\}$ yield firm i's best responses to the sales decisions of the other two firms. A best response function specifies an amount to sell in each market, given the sales in the market of the firm's two rivals.

Using the above model, Bown and Crowley totally differentiate the nine first order conditions of (2) to demonstrate the effect on trade between all three countries, relative to the free-trade equilibrium, if country A imposes a tariff on the imports of country B. They conclude that the following effects are to be expected:

1. "trade destruction, a decline in country B's exports to country A $\left(\frac{dm_{ba}}{d\tau_{ba}} < 0\right)$,
2. trade creation via import source diversion, an increase in country C's exports to country A $\left(\frac{dm_{ca}}{d\tau_{ba}} > 0\right)$,
3. trade deflection, an increase in country B's exports to country C$\left(\frac{dm_{bc}}{d\tau_{ba}} > 0\right)$, and
4. trade depression, a decrease in country C's exports to country B$\left(\frac{dm_{cb}}{d\tau_{ba}} < 0\right)$" (Bown and Crowley).

b. Econometric Model

Our empirical analysis focuses on the predictions above by estimating the degree by which agricultural imports targeted in AD/CVD cases are affected by an AD or CVD import duty. At the same time we estimate how imports from third countries, not named in the AD/CVD, react to the imposition of an import duty on their competitors. It is hypothesized that the incidence of trade diversion (what Bown and Crowley termed "trade creation via import source diversion") will be low given the limited number of countries that compete in similar, or "like", agricultural products. The exporting countries named in an AD/CVD suit are typically large producers and exporters of the subject good. The extent by which smaller producers in non-named countries, if they exist, can work their way into the U.S. market pending an affirmative ruling, may be limited as we explain above.

Feasible generalized least squares is used to estimate the average effect on U.S. agricultural imports of an AD or CVD case when the final ruling is either in favor or against the domestic industry. We consider the value of imports from named and non-named countries in order to estimate the degree, if any, of trade diversion. The model is specified as:

$$\ln(imports_{i,t}) = \alpha + \beta_1 \ln(duty_{i,t}) * D_t + \beta_2 \ln(foreignag_{it}) + \beta_3 \ln(exchrate_{it}) + \beta_4 \ln(valueUS\ prod_{it}) + \beta_5 Trend_t + \varepsilon_{i,t} \quad (3)$$

The natural log of the annual value of U.S. imports is represented by $\ln(imports_{i,t})$ for the i^{th} case and year t. Real import values are normalized around t_0, where t_0 is the 12 months following the month the investigation was filed. For example, the AD/CVD cases against pasta imports from Italy and Turkey were initiated in June 1995; t_0 therefore represents the sum of imports from June 1995 to May 1996, a full year following the initiation of the case, hereafter referred to as the investigation year. The timeline extends from two years prior to the investigation year to three years after the investigation year, i.e., t = -2,…,3.

The monthly import values were collected according to the Tariff Schedules of the United States (TSUS) and Harmonized Tariff Schedule (HTS) line codes as presented in the U.S. Federal Register case notices. Concordance between TSUSA and HTS line codes was made using tables provided by the Centre for International Data (University of California, Davis).

We considered cases that were initiated between 1980 and 2000. For joint AD/CVD cases where there was an affirmative ruling for both cases, the import data are used only once thereby reducing the number of cases from 40 to 32. In such a circumstance, the higher of either the AD or CV duty is used in the regression since it will precipitate the greatest response.

The variable $ln(duty_{i,t})$ denotes the size of the weighted average final margin, in percent, as specified in the U.S. Federal Register case notices. Prior to t_0, AD and CV duty rates are zero.[4] The dummy variable D_t is a cumulative time dummy that allows us to measure the effect of the duty in each period compared to the previous period. For example, in period t_0, the parameter on duty would indicate the effect on imports compared to imports in period t-1. Duties are only

[4] While the AD and CV duties are zero prior to the investigation year, some of the commodities had a small MFN duty in place prior to the investigation. These duties are not included in the model.

applied from time t_0 onwards. Final duty rates are used in our analysis, starting in $\underline{t_0}$. Preliminary rates are not used because they differed from final rates in 19 of the 40 cases with affirmative final rulings and that difference was only 12% on average.

Following Bown and Crowley, three control variables are included to check for sensitivity of results. The value of foreign agriculture $ln(foreign\ ag_{it})$ is used as a proxy for growth in the agricultural sector of the named country (export-supply shifter). It is expected that as this value increases, so too will exports of the named commodity to the United States. The change in the exchange rate between the currency of the named country relative to the U.S. dollar is captured by $ln(exchrate_{it})$. As the foreign currency depreciates, U.S. imports of commodity *i* would be expected to increase. The third control variable is the value of U.S. agricultural production of commodity *i* (an import-demand shifter). As U.S. production of *i* increases, imports would be expected to fall. For processed products such as canned pineapple or canned mushroom, the value of the primary product is considered. A trend variable is also included to account for any macroeconomic changes occurring over the 25 year period (1978-2003).

The model was estimated using feasible generalized least squares. Independence across cases, *i*, is assumed. Panel robust standard errors are used to correct for heteroskedasticty across cases and panel-specific AR1 autocorrelation structure is employed to correct for serial correlation within the time series of each case. A principal assumption behind our model is that the estimated parameters are identical across panels. This assumption may not seem reasonable given the diversity of commodities involved, but it allows us to estimate the average effect of the duty. Estimation of each individual case would not yield robust results, given the limited number of data points for each commodity.

c. Econometric Results

c.i Named Countries

Two specifications of the model are used to estimate the degree to which US imports from named countries are affected by an AD or CV duty. The first specification follows equation (3) while the second considers the average impact of the duty over the years t_0 to $t+3$ when duties are in the upper or lower quartile. In the first specification the value of U.S. imports from the named countries is negatively affected by the size of the AD or CV duty. Given the log-log specification on most exogenous variables, the estimated parameters on $ln(duty_{i,t})*D_t$ may be interpreted as an elasticity. In table 2 results are reported for seven different scenarios. Column 1 reports the baseline scenario where no control variables are included in the regression. Columns 2-7 include different combinations of the control variables. The estimates on the control variables are significant for the exchange rate and the value of U.S. production in column 7. The range of these estimates is narrow across the scenarios when they are statistically significant. The exchange rate has the expected negative sign. Thus, as the foreign currency depreciates by 10% relative to the U.S. dollar, imports from the named country would increase between 15.3% and 19.8%. A 10% increase in the value of US production of the like-good results in a 23% to 26%. This result has the opposite sign than expected. One might hypothesize that as U.S. production expands, U.S. consumers become more accustomed to having that commodity available and demand therefore increases. This would be a situation of supply-driven demand. The value of foreign agriculture has no statistically significant effect on US imports.

Including different combinations of the control variables allows for a complete assessment of the effect of the duty in isolation of other factors. Over the seven scenarios, (1) to (7), we see that imports fall relative to the preceding year in periods t_0 and $t+2$. In the

investigation year, for every 10% increase in the duty imports decline between 10.0% and 13.7%. In period *t+1*, imports are most affected by the imposition of the duty: every 10% increase in the duty results in a further decline in U.S. imports in the range of 23.2% and 28.7%. It is in this period that foreign producers have typically increased their exports by adjusting their marketing decisions in response to the duty. In *t+2* there is only a slight drop in US imports from named countries compared to *t+1* but this drop is only significantly different from zero in columns 1, 3 and 5. By period *t+3*, the effect on imports is no longer significantly different from the preceding period.

Given the large range of duties imposed, a second specification of the model is used that calculates the effect on US import values when duties are either in the upper or lower quartile of the range of duties: those greater than 60% or lower than 4.5% respectively (table 3).[5] The same control variables as in the previous specification are maintained. The coefficients on high and low duty are intercept dummies that, when converted, indicate the average change in imports over all four time periods, t_0 to *t+3*, relative to goods subject medium duties (second and third quartile, i.e., between 4.5% and 60%). The estimates on *HighDuty* reveal that the imports of commodities subject to high duties are, on average, between 73% and 81% lower than what they would have been with the medium duty. This is not surprising given that the majority of the duties in the top quartile are greater than 150%. The estimates on *LowDuty* are all positive and highly significant, indicating that when goods are subject to duties less than 4.5%, named countries will continue to increase exports to the complainant country between 62% and 127%. Low duties therefore have very little effect on retarding trade from the named country,

[5] While the average duty for affirmative cases is 58%, the median is 12.4% due to the number of cases with duties over 100%. The third specification of the model therefore separates the analysis for the upper and lower quartiles of the duty rates. The upper quartile includes those cases subject to duties greater than 60% and the lower quartile includes cases with duties less than 4.5%.

supporting Prusa's (1997) claim that low import duties are more likely to lead to beneficial coordination between the country initiating the case and the implicated country. Low AD duties need not be paid if the named country increases its export price to the U.S. by the full amount of the duty while holding prices in the home market constant. Such an agreement can precipitate an increase in import values after the investigation, benefiting both the named country and U.S. producers. Two of the three control variables are statistically significant in each of the specifications of this model, value of foreign agriculture and value of U.S. production. As the value of foreign agriculture increases by 10%, imports increase between 20% and 29%. As the value of U.S. production increases, imports are estimated to increase between 17.1% and 17.9%, again an example of supply-driven demand.

c.ii Non-Named Countries

Equation 3 is used to estimate the effect on U.S. imports from non-named countries when a duty is imposed on a named country. If the theory of trade diversion holds for agricultural products, then we would expect to see an increase in imports from non-named countries in at least one of the periods following the initiation of a case. As is shown in table 4, this is not the case. In each of the periods t_0 to $t+3$, imports from non named countries decrease.[6] Column 3 indicates that the average decrease in U.S. imports from non-named countries over the four periods is 7.1% for every 10% increase in the duty. The control variable on the value U.S. production is statistically insignificant.

It could be argued that since exporting countries not-named in an AD/CVD case do not have to pay the preliminary or final import duties, they are not sensitive to marginal changes in the duty so much as they would be to the overall magnitude of the duty, i.e. whether it is a low

[6] Due to collinearity, the ln(Value of Foreign Agriculture) and ln(Exchange Rate) are omitted from the model. Consequently only three columns of results are appropriate.

duty or a high duty. A high duty has a strong detrimental effect on imports from named countries leaving a large gap in the market that non-named countries could fill. Furthermore, Staiger and Wolak (1994) argue that the mere initiation of a case, regardless of its final outcome, is sufficient to prompt non-named countries to increase their exports to the complainant country, a phenomenon they call the "investigation effect". A third specification of the GLS model that omits the duty is therefore used for non-named countries. Dummy variables for each of the time periods, $t_0,...,t+3$, and each of the possible outcomes (i.e., negative or affirmative) are used to measure how non-named countries respond to AD/CVD cases against competing exporters. It is hypothesized that exports from non-named countries would be positively affected by an affirmative ruling on named countries. This would be evidence of trade diversion. When a ruling is negative, non-named countries would be expected to benefit from increased exports for a year or two, while the targeted countries are subject to preliminary duties. This would be possible if the non-named countries could adjust agricultural production and marketing decisions swiftly enough to take advantage of the gap in the home country market. Lastly, cases that are suspended or terminated generally reach that conclusion within a year of initiation, giving little time for non-named countries to respond. It is hypothesized that there will be little evidence of trade diversion when cases are terminated or suspended.

Table 5 presents the results of the regression analysis of imports from non-named countries. Columns 1 and 2 report results from an analysis of the complete set of targeted commodities in each period i.e., all cases regardless of the final ruling. Columns 3 and 4 examine the effect on imports from non-named countries when the duties imposed in affirmative rulings were greater than 60% or less than 4.5%. The hypothesis is that a high duty will sharply depress imports from named countries leaving a significant gap in the home country market which non-

named countries will attempt to fill. When the three control variables are included in the model, the value of agriculture in the named country and exchange rate are rejected from the regression due to collinearity; only the control variable of US production value is kept in the specification.

The most evident result from the first two columns is that in only once instance is there a statistically significant indication of trade diversion i.e., where the effect on U.S. imports is positive. This occurs in period t_0 when the case is ultimately terminated or suspended. Such a result suggests that while a country targeted in a trade dispute may have been accused of selling at below normal value, there may actually have been a more general trend by many countries of increased U.S. imports of the named commodity. Only the countries most responsible for the greatest share of that increase would be targeted, but unjustly so given the final result. Non-named countries do not feel deterred by the actions of the U.S. industry towards their competitors, and maintain their sales to the U.S. market.

When the case rulings are affirmative, imports from countries not named in the case do not change in any significant way from the base period for the first three periods. The relatively short time frame may be insufficient to allow exporters to change production patterns and increase exports to the U.S. agricultural imports from non-named countries do not change when there is a negative ruling.

Columns 3 and 4 indicate that when imposed duties are less than 4.5%, imports from non-named countries increase 51% (column 4). When duties are greater than 60%, imports from non-named countries are 61%-66% less than goods subject to medium duties. This is a surprising result because exactly the opposite was expected. It suggests that rather than responding to the gap in the market and increasing exports to the United States, non-named countries may be

intimidated by the size of the duty imposed on their competitors and therefore hold back their shipments in order not to draw attention to themselves.

The value of U.S. production has a statistically significant result only in both specifications. As predicted, demand for imports falls as the value of US production increases.

V. Conclusion

There is econometric evidence in the literature about the lasting effect of AD cases on imports from the named country starting in the investigation year. For manufactured products, previous research has shown that the protection offered by AD and CV duties to the domestic industry can be largely offset by trade diversion, mitigating the protective effect of the duties. The results for the agricultural sector do not support this result. We have shown that in agriculture, the relative importance of trade diversion is far less compared to manufacturing. The AD and CV duties successfully reduce foreign competition in the domestic market. The most likely explanations for this result includes the seasonality of production and the consequent lack of flexibility of non-named countries to quickly adjust output and exports. In addition, for many commodities such a livestock or fish, there may be few, if any, alternative suppliers to the U.S. market. There is also the food safety aspect. Agricultural exports to the United States must meet stringent food safety and pest guidelines. As a result, third country exporters may face an institutional restriction inhibiting their ability to quickly fill the gap left in the U.S. market. In order for non-named exporters to expand production of the affected commodity and meet U.S. import quality standards would require assurance that the impact on the named country was permanent and that there was a real opportunity in the U.S. market. There is also the risk that named countries have the option of adjusting their prices to lower AD or CV duties, allowing

them to re-capture the U.S. market. Because of this risk, non-named countries do not typically replace the named country as the principal supplier of the agricultural good. Thus in U.S. agriculture, the benefits from an affirmative ruling provides a clear incentive for U.S. producers to take the costly gamble of initiating an AD or CVD case.

Given that traditional trade barriers remain relatively high for many U.S. agricultural products there remains a significant transition period ahead for this industry. U.S. farmers will have to more openly compete with foreign suppliers in the coming years. Pressure for freer markets will come from both domestic and foreign sources. Based on our findings, we conclude that the past success of AD and CVD actions protecting U.S. agriculture will lead to more frequent use of AD and CVD laws by U.S. farmers.

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Table 1. Outcome of U.S. Agricultural AD/CVD Cases Filed 1980 to 2003

	AD	CVD	Total
Affirmative	29	18	47
Negative	20	15	35
Suspended or Terminated	7	8	15
Total agricultural AD/CVD cases filed	56	41	97

Source: Collected from U.S. Department of Commerce, (www.ia.ita.doc.gov/stats/

Table 2. Estimated effect on US Agricultural Imports from Named Countries Given an Affirmative Ruling

	(1) Baseline	(2) Control: Ag value	(3) Control: Exch rate	(4) Control: US Prod'n value	(5) Control: Ag Value & Exch Rate	(6) Control: Ag Value & US Prod'n value	(7) Control: Exch rate & US Prod'n value
Constant	9.103	8.799	9.130	6.459	9.230	6.262	6.199
	(0.235)***	(0.304)***	(0.229)***	(0.440)***	(0.202)***	(0.498)***	(0.567)***
Ln(Duty) x D0	-0.117	-0.125	-0.132	-0.103	-0.137	-0.103	-0.113
	(0.038)***	(0.038)***	(0.037)***	(0.038)***	(0.037)***	(0.038)***	(0.038)***
Ln(Duty) x D1	-0.268	-0.263	-0.280	-0.244	-0.287	-0.232	-0.253
	(0.038)***	(0.038)***	(0.037)***	(0.038)***	(0.037)***	(0.038)***	(0.038)***
Ln(Duty) x D2	-0.067	-0.053	-0.085	-0.048	-0.090	-0.034	-0.062
	(0.038)*	(0.038)	(0.037)**	(0.038)	(0.038)**	(0.038)	(0.038)
Ln(Duty) x D3	-0.051	-0.037	-0.051	-0.033	-0.058	-0.019	-0.033
	(0.039)	(0.039)	(0.038)	(0.039)	(0.038)	(0.039)	(0.039)
Control variables:							
Ln(Value of Foreign Ag)		0.151			-0.073	0.097	
		(0.113)			(0.088)	(0.077)	
Ln(Exchange Rate)			-0.198		-0.197		-0.153
			(0.041)***		(0.041)***		(0.043)***
Ln(Value of US Prod'n)				0.233		0.258	0.261
				(0.034)***		(0.037)***	(0.043)***
Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chi-squared	66.90	72.52	103.89	114.43	111.64	123.51	123.40
Observations	224	224	224	224	224	224	224
Number of Commodities	32	32	32	32	32	32	32

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3. Estimated Effect on U.S. Agricultural Imports from Named Countries Given High or Low Duties

	(1) Baseline	(2) Control: Ag value	(3) Control: Exch Rate depreciation	(4) Control: US Prod'n value	(5) Control: Ag Value and Exch Rate Depreciation	(6) Control: Ag value & US Prodn	(7) Control: Exch rate & US Prodn
Constant	9.068	8.363	9.133	7.089	8.471	6.874	7.204
	(0.110)***	(0.196)***	(0.119)***	(0.268)***	(0.210)***	(0.223)***	(0.259)***
Low Duty (<4.5%)	0.569	0.822	0.530	0.568	0.786	0.483	0.565
	(0.171)***	(0.165)***	(0.187)***	(0.267)**	(0.165)***	(0.258)*	(0.266)**
High Duty (>60%)	-1.347	-1.639	-1.387	-1.345	-1.596	-1.667	-1.316
	(0.278)***	(0.340)***	(0.253)***	(0.317)***	(0.336)***	(0.247)***	(0.301)***
Control Variables:							
Ln(Value of Foreign Ag)		0.293			0.251	0.204	
		(0.066)***			(0.071)***	(0.051)***	
Ln(Exchange Rate)			0.013		-0.034		-0.036
			(0.035)		(0.028)		(0.020)*
Ln(Value of US Prod'n)				0.179		0.171	0.175
				(0.026)***		(0.021)***	(0.025)***
Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chi-squared	36.53	55.80	42.67	92.13	58.35	148.37	100.23
Observations	452	451	452	452	451	451	452
Number of Commodities	67	67	67	67	67	67	67

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4. Estimate effect on US Agricultural Imports from Non -Named Countries Given an Affirmative Ruling only

	(1) Baseline	(2) Control: US Prod'n value	(3) Average duty
Constant	6.978	7.091	7.808
	(0.190)***	(0.672)***	(0.635)***
Ln(Duty)			-0.071
			(0.029)**
Ln(Duty) x D0	-0.059	-0.056	
	(0.025)**	(0.028)**	
Ln(Duty) x D1	-0.006	0.007	
	(0.025)	(0.028)	
Ln(Duty) x D2	-0.042	-0.058	
	(0.025)*	(0.028)**	
Ln(Duty) x D3	-0.073	-0.086	
	(0.026)***	(0.028)***	
Control variable:			
Ln(Value of US Prod'n)		-0.011	-0.059
		(0.051)	(0.048)
Trend variable	Yes	Yes	Yes
Chi-squared	134.05	134.50	122.91
Observations	146	146	146
Number of Commodities	21	21	21

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

[+] Ln(Value of US Production) and Ln(Exchange Rate) were dropped due to collinearity

Table 5: Effect on U.S. Agricultural Imports from Non-Named Countries Contingent on Ruling and Relative Size of Duty

	(1)	(2)	(3)	(4)
	Baseline	Control: US Prod'n value	High/Low Duties	High/Low Duties Control: US Prod'n value
Constant	7.299	7.299	7.385	7.831
	(0.162)***	(0.162)***	(0.148)***	(0.220)***
Low Duty (<4.5%)			0.148	0.414
			(0.157)	(0.146)***
High Duty (>60%)			-1.081	-0.949
			(0.136)***	(0.131)***
Affirmative x D0	0.013	-0.022		
	(0.072)	(0.079)		
Affirmative x D1	0.062	0.047		
	(0.072)	(0.079)		
Affirmative x D2	-0.034	-0.042		
	(0.072)	(0.080)		
Affirmative x D3	-0.132	-0.158		
	(0.073)*	(0.082)*		
Negative x D0	0.119	0.133		
	(0.125)	(0.130)		
Negative x D1	-0.076	-0.078		
	(0.127)	(0.131)		
Negative x D2	-0.053	-0.062		
	(0.129)	(0.132)		
Negative x D3	-0.150	-0.150		
	(0.130)	(0.133)		
Terminated x D0	0.190	0.223		
	(0.097)*	(0.099)**		
Terminated x D1	0.107	0.091		
	(0.099)	(0.101)		
Terminated x D2	-0.085	-0.092		
	(0.100)	(0.102)		
Terminated x D3	-0.219	-0.201		
	(0.102)**	(0.104)*		
Control Variables:				
Ln(Value of US Prod'n)		-0.030		-0.067
		(0.014)**		(0.012)***
Trend variable	Yes	Yes	Yes	Yes
Chi-squared	142.77	211.28	240.96	320.64
Observations	329	329	329	329
Number of Commodities	47	47	47	47

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%