

Antidumping, Retaliation Threats, and Export Prices

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Utilizing four-dimensional (firm-product-destination-year) Brazilian firm-level export data, we show that antidumping (AD) duties result in a significant and dramatic increase in the unit values of the products that firms export to duty-imposing countries. Furthermore, we examine the effect of potential (retaliatory) AD duties on the unit price of the firms' shipments. Our findings suggest that AD activities in Brazil lead Brazilian exporting firms to increase their unit export prices for the named industries' products to decrease the dumping margin and avoid the threat of retaliation by the target countries. JEL codes: F10, F13, O54, C23

The last two decades have witnessed rising administrative protection via anti-dumping (AD) measures. When countries negotiate lower tariffs in trade agreements, domestic industries that desire protection against imports can employ several methods to gain temporary protection. The most popular of these methods is to claim that the trade partner is dumping or selling below the "fair value." This claim is often made and often generates temporary protection, even if it is not true (Konings and Vandenbussche 2008; Aggarwal 2007). AD is an effective loophole that has been exploited by both developed and developing countries.¹ According to the records of the Global Antidumping Database of the World Bank (Bown 2010), roughly 4,500 AD petitions have been filed in the last 20 years by more than 40 countries.

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1. See Blonigen and Prusa (2003) for an extensive survey.

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This study empirically examines the pricing effect of AD duties using highly disaggregated firm-level Brazilian export data. First, we examine the effect of AD duties that are imposed on Brazilian exporters on the export prices that they charge in their trading partners' markets. Second, we investigate the effect of potential (retaliatory) AD measures on the export prices of products that Brazilian firms export to markets that may file AD petitions against the firms. When an AD petition is filed by domestic industries and exporters' flexibility to price discriminate between the home and target countries is restrained because of the threat of retaliation, we expect the exporting firms to respond by increasing the prices of their shipments to the target country to reduce the dumping margin and avoid that threat. In other words, potential AD duties can have price-increasing effects similar to imposed duties because of retaliatory incentives. Our findings clearly demonstrate such an impact.

In addition to the proliferation of AD duties, several studies have analyzed their pricing and trading effects. For instance, [Prusa \(2001\)](#) and [Ganguli \(2008\)](#) estimate the effect of AD duties on the products being imported and show that these duties have a dramatic impact on import prices and import values for the United States and India, respectively.² [Bown and Crowley \(2006\)](#) show that imposition of AD duties also affects the prices of the targeted countries' products in alternative destinations. Studies examining the pricing effect of AD duties also consider the impact of events (filing, decision, and termination) during the determination period of AD investigations into the pricing decisions of foreign firms ([Staiger and Wolak 1994](#); [Krupp and Polard 1996](#)). Moreover, [Prusa \(1992\)](#) focuses on how AD cases might lead to collusion between domestic and foreign firms. We contribute to this literature through the innovative use of four-dimensional customs data (firms, products, destinations, and years) to determine the effects of AD duties and the threat of their enforcement on export prices.

Our retaliation analysis broadly fits into the literature that investigates retaliatory incentives in AD activity. Many existing studies propose a number of political and strategic considerations to explain the proliferation of AD duties even though the ideal AD case aims to hinder unfair competition in the international market. One proposed explanation is that countries tend to retaliate against countries by which they were previously targeted in AD investigations ([Miranda et al. 1998](#); [Prusa and Skeath 2002](#); [Francois and Niels 2004](#); [Feinberg and Reynolds 2006](#)). These studies suggest that this tit-for-tat strategy in AD actions has created an "AD club," which consists of countries that have implemented and actively utilize AD law. [Blonigen and Bown \(2003\)](#), however, provide another perspective on the debate. They suggest that the worldwide spread of AD regimes may dampen AD activity because countries become able to retaliate when they begin enforcing these laws. Concentrating on AD activity in the United States, these authors show that the risk of a potential reaction

2. India and the United States are the top two AD users in the world.

from the target country decreases the probability of an AD petition from U.S. industries as well as decreasing the likelihood of an affirmative AD decision from the U.S. AD agency. Whether retaliation encourages or dampens the spread of AD activity worldwide has been widely examined, but nothing is known about domestic exporters' responses to the threat of AD retaliation. To our knowledge, this is the first paper to address this issue by documenting exporters' price adjustments due to this threat.

Empirical works using firm-level data are scarce in the AD literature. One strand of the literature focuses on the productivity effects of AD duties on domestic firms (Konings and Vandenbussche 2008; Pierce 2011). In contrast, Belderbos (1997) investigates the relationship between AD enforcement and foreign direct investment. Konings and Vandenbussche's (2009) study is the only one to focus on the effect of AD duties on export sales using firm-level data. To our knowledge, this study is the first attempt to use disaggregated firm-level data to analyze the pricing effect of AD duties.

In terms of the effects of a country's own AD activity on its domestic exports, our analysis of the pricing effects of retaliation threats most closely complements the study by Konings and Vandenbussche (2009), which examines the impact of France's AD duties on the export sales of protected firms. Using French exporters' firm-level customs data, they show that foreign export sales decreased dramatically among the protected firms. They also note that this decrease might be a consequence of the limitations of price setting in the international market, stemming from AD protection in the home market.

Like Konings and Vandenbussche's (2009) study, our AD threat analysis focuses on the effect of a country's AD activity on its export markets rather than its domestic market. However, the two works differ in two key respects. First, Konings and Vandenbussche (2009) use a difference-in-differences approach to determine the effect of AD on the exports of protected firms compared with a control group of unprotected firms. In contrast, we focus on the threat of retaliation resulting from ongoing AD investigations, regardless of their tentative outcomes, rather than the impact of AD protection in the home market. Prusa (2001) shows that exporters react to a tentative AD duty imposition immediately after an AD investigation is filed and that AD filings reduce the imports of the countries named in a filing even if the complaints are not upheld. From this point of view, beginning an investigation triggers retaliatory incentives for the target country.³ Additionally, our analysis is based on the trading effects of AD activity in a particular export destination, namely, the country targeted by the domestic industries rather than the entire international market. In this regard, the four-dimensional information on firms, products, and export destinations in the Brazilian firm-level export data fits our research question perfectly.

3. Studies on retaliation and AD also use filing behavior as the dependent variable.

In addition to its rich firm-level export data, Brazil is a suitable country for our analysis in terms of AD. Brazil implemented an AD law in 1987, and it ranks in the top 10 of all World Trade Organization (WTO) members in terms of both the number of AD petitions filed and the number of AD duties targeted against it in the post-WTO period. Brazil was the defendant country in 26 AD cases during our sample period, which corresponds to 208 unique six-digit Harmonized System (HS) products from 11 different industries.⁴ Furthermore, Brazil filed 71 AD cases for 96 six-digit HS products, which is far above the mean and median of worldwide AD activity.

As shown in table 2, Brazil named its major trading partners, which are also very active AD users. Brazil seems to be a member of the “AD club”; its major trading partners also targeted Brazil in several cases after the creation of the WTO. Therefore, the threat of AD retaliation is an important consideration for exporters, not only because of the dramatic impact of AD duties on trade flows, but also because of the target countries’ past AD activities against Brazil. In tables 3 and 4, we document the AD cases filed by and against Brazil by three-digit ISIC industry codes. In line with worldwide AD activities, the chemical and iron-steel industries dominate the filings in terms of the number of cases.⁵

The remainder of the paper is organized as follows. The second section describes the data, the third section presents the empirical methodology and results, and the fourth section concludes.

DATA

We employed detailed export data from the Brazilian customs office, SECEX (*Secretaria de Comércio Exterior*), which gathers export reports using product codes at the plant, month, and NCM (*Nomenclatura Comum do Mercosul*) levels. The NCM codes are eight-digit numbers, the first six digits of which coincide with the first six digits in the HS. The destination information is transformed from the Brazilian country codes into the international ISO system. The product codes at the six-digit level in the Brazilian data, for which no corresponding HS entries exist, were removed from the data. All export values in the SECEX data are reported in current U.S. dollars (USD), free on board (fob). We used observations on exporting plants, declared export values, export destinations and export quantities, and we aggregated monthly plant-level export information to years and firms. We focused solely on manufactured products. The main variable of interest in our analysis is the unit price of the exported good p , shipped by firm f to destination d , which is modeled as

4. See table 1 for the AD duties of importing countries.

5. Most of the AD cases are filed for multiple products. Therefore, the number of cases does not always represent the number of six-digit HS products investigated.

TABLE 1. Antidumping Duties in Force against Brazilian Exporters (by Importing Country) (1997–2000)

Country	Number of cases
Argentina	14
European Union	4
Mexico	3
Canada	2
United States of America	1
South Africa	1

Source: Bown (2010)

TABLE 2. Defendant Countries in Brazil's Antidumping Investigations (1996–1999)

Country	Number of cases
USA	10
China	9
Germany	4
South Africa	4
France	3
India	3
Mexico	3
Spain	3
Romania	3
United Kingdom	3
Chile	2
Japan	2
Kazakhstan	2
Russia	2
Venezuela	2
Argentina	1
Australia	1
Bangladesh	1
Bulgaria	1
Cuba	1
Denmark	1
Hong Kong	1
Italy	1
Netherlands	1
New Zealand	1
Poland	1
Thailand	1
Taiwan	1
Ukraine	1
Uruguay	1

Source: Bown (2010)

TABLE 3. Brazilian Industries Facing AD Duties

	Three-digit ISIC Industry	Number of cases
311	Food products	1
313	Beverages	0
314	Tobacco	0
321	Textiles	1
322	Apparel except footwear	0
323	Leather products	0
324	Footwear except rubber or plastic	0
331	Wood products except furniture	0
332	Furniture except metal	0
341	Paper and products	2
342	Printing and publishing	0
351	Industrial chemicals	3
352	Other chemicals	0
353	Petroleum refineries	0
354	Miscellaneous petroleum and coal products	0
355	Rubber products	0
356	Plastic products	0
361	Pottery, china, earthenware	0
362	Glass and products	1
369	Other non-metallic min. products	1
371	Iron and steel	12
372	Non-ferrous metals	0
381	Fabricated metal products	1
382	Machinery except electrical	0
383	Machinery electric	3
384	Transport equipment	0
385	Professional and scientific equipment	1
390	Other manufactured products	1

Source: Bown (2010)

follows:

$$u_{fpd} = \frac{\text{Export value}_{fpd}}{\text{Quantity}_{fpd}}.$$

Our sample covered the years from 1997 to 2000 because export quantities were only available for this period. We also removed all observations for which the export value was zero, and there was no information on the quantity of shipments.

The Brazilian firms' employment data were obtained from the RAIS (*Relacao Anual de Informacoes Sociais*), a collection of annual reports with individual information on workers and employees. Similarly, we aggregated the monthly worker-plant information to years and firms.⁶

6. See Molina and Muendler (2009) and Hirakawa, Muendler and Rauch (2010) for more information about SECEX and RAIS data.

TABLE 4. Brazil's Antidumping Filings by Industry (1996–1999)

	Three-digit ISIC industry	Number of cases
311	Food products	5
313	Beverages	0
314	Tobacco	0
321	Textiles	3
322	Apparel except footwear	0
323	Leather products	0
324	Footwear except rubber or plastic	0
331	Wood products except furniture	0
332	Furniture except metal	0
341	Paper and products	0
342	Printing and publishing	0
351	Industrial chemicals	27
352	Other chemicals	3
353	Petroleum refineries	0
354	Miscellaneous petroleum and coal products	0
355	Rubber products	6
356	Plastic products	0
361	Pottery, china, earthenware	0
362	Glass and products	1
369	Other non-metallic min. products	4
371	Iron and steel	15
372	Non-ferrous metals	0
381	Fabricated metal products	2
382	Machinery except electrical	1
383	Machinery electric	0
384	Transport equipment	0
385	Professional and scientific equipment	2
390	Other manufactured products	1

Source: Bown (2010)

The data on AD activity were obtained from the Global Antidumping Database of the World Bank.⁷ This database provides detailed case-level information on AD filings and outcomes, such as the dates of the filing and the decision, the target country, the final decision of the AD authority, and the HS codes of the products subject to filings. To match the six-digit HS product codes with three-digit ISIC codes, we used the concordances in the World Bank's Trade Production and Protection Database. Finally, for the product-level import data, we used the UN COMTRADE database.

EMPIRICAL ANALYSIS

As discussed above, we are primarily interested in the variations in Brazilian firms' unit export values within products across the export destinations. To

7. <http://econ.worldbank.org/ttbd/gad>.

quantify the effect of AD duties and the retaliation threats on the prices of exports being shipped, we begin by estimating the following baseline equation:

$$\log(u_{fpt}) = \gamma_0 + \gamma_1(ADduty)_{pdt} + \gamma_2(Threat)_{kd,t-1} + \varepsilon_{fpt},$$

where f denotes the firm, p denotes the six-digit HS product code, and d denotes the export destination. As noted earlier, the variable u_{fpt} denotes the unit values of the exported products; $(ADduty)_{pdt}$ is a binary indicator and is unity if there is an AD duty in force in year t by country d against Brazil for product p . $(Threat)_{kd,t-1}$ is a binary indicator that takes a value of one if Brazil filed an AD investigation against country d in the three-digit ISIC industry category k in the previous year. We consider it plausible that firms in the same industry may be connected via unions, trade associations, and other business organizations. Thus, retaliation may be reflected at the industry level, although AD filings target a narrow product line.^{8,9} In addition, this variable is zero for countries that have not implemented an AD law because they have no capacity to retaliate. We treat the European Union countries as a single country because AD is a European Union-wide policy.¹⁰

Other Considerations

We include firm-product-destination fixed effects in our specifications to control for firm-level unobservables, such as managerial ability, to account for the heterogeneity in the quantities' units of measurement, which are used to create the unit export values and to control for time-invariant, country-specific factors, such as distance.¹¹ Moreover, we use the total export revenues of the firm, which measure not only the size but also the market power in the international market.¹²

In addition, as stated in Verhoogen (2008) and Hallak and Sivadasan (2008), larger and more productive firms pay higher wages and employ better inputs, resulting in higher quality in exports, which are sold for higher prices. Although we do not have information on domestic sales, we use the "number of workers" obtained from the linked employment data to represent the size of the firm.¹³

8. See Feinberg and Reynolds (2006).

9. Given the large costs associated with initiating AD investigations, firms often come together via lobbies to file petitions and share the cost of filing.

10. Our results are insensitive to treating each European Union country as a different market and to removing European Union countries from the sample.

11. The linked employment data also report the wage bill paid by the firm. However, the availability of this variable is so limited in our sample that it is unusable.

12. Although we do not report the results here, the alternative measure of the use of total revenue that a firm earns from the same product in the destination does not alter our findings.

13. The linked employment data also report the wage bill paid by the firm. However, the availability of this variable is limited in our sample, which does not allow us to utilize the data.

Recent literature (including, but not limited to, Hallak 2006, Kneller and Yu 2008, Harrigan and Deng 2008, Manova and Zhang 2009, Bastos and Silva 2010), on the other hand, has documented that the unit value of shipments increases with distance, size and the income of the destination country. Therefore, part of the variation in unit export values can be explained by these country-specific covariates. In this regard, we use country-year dummies to control for all time-varying destination market aggregates, such as GDP and exchange rate. Further, Manova and Zhang (2009) demonstrated a positive relationship between the revenue exporters earn and the prices that they charge in the export market. For this consideration, we also include the total revenue that the firm earns in the export destination.¹⁴

Another concern in estimating (2) is that export revenues and quantities may suffer from measurement error. To remedy this concern, we removed outliers, firm-product-destination combinations with export values below the 1st percentile or above the 99th percentile of the distribution, to reduce the bias associated with measurement error. The extensive fixed effects in our specifications also attenuate measurement error concerns.¹⁵

RESULTS

After removing all observations lacking quantity or export value information, roughly 450,000 observations remain.¹⁶ All of the regression results are derived from a panel-data fixed effect estimation in which the panel is a firm-product-destination triplet. All of the specifications include country-year dummies to control for aggregate variation in the export market. Table 5 contains the main results derived from estimating equation (2). In column (1), we report our estimates without controls. We include our controls in the remaining specifications. The variable $\log(\text{exportrevenue})_{fdt}$ denotes the total revenue that firm f earns in market d , $\log(\text{exportrevenue})_{ft}$ denotes the total export revenue of the firm, $\log(m)_{pdt}$ is the average unit import value of the six-digit HS product p in a particular destination, and $\log(\text{employment})_{ft}$ is the number of workers that firm f employs. The availability of employment data determines the sample size in the last specification.

Table 5 lists the regression estimates. First, regarding the effect of the imposed AD duties, we see that the coefficient of the AD duty variable in the first three columns suggests a large and significant pricing effect. AD duties lead to a 23 percent increase in the price charged by Brazilian exporting firms in the duty-imposing country for the products named in an AD filing.¹⁷

14. While we do not report the results here, the use of total revenue that the firm earns from the same product in the destination as an alternative measure does not alter our findings.

15. See Manova and Zhang (2009) for the same argument.

16. Individual exporting activities are unit observations where there is no firm code.

17. We use the formula in Kennedy (1981) to convert the coefficient of the dummy variable to its true marginal effect.

TABLE 5. Estimation Results Dependent Variable: $\log(u_{fpt})$

	1	2	3	4	5
$(ADduty)_{pdt}$	0.236 (0.07)***	0.232 (0.07)***	0.228 (0.06)***	0.196 (0.08)***	
$(ADduty)_{pdt} \times \text{Chemical/Steel}$					0.278 (0.05)***
$(ADduty)_{pdt} \times \text{Non Chemical/Steel}$					0.178 (0.08)**
$(ADduty)_{pdt,t-1}$				0.199 (0.09)**	
$(ADduty)_{pdt,t-2}$				0.206 (0.10)**	
$(Threat)_{kd,t-1}$	0.102 (0.04)**	0.102 (0.04)**	0.098 (0.05)*	0.088 (0.02)**	
$(Threat)_{kd,t-1} \times \text{Chemical/Steel}$					0.145 (0.03)***
$(Threat)_{kd,t-1} \times \text{Non Chemical/Steel}$					0.079 (0.04)*
$(Threat)_{kd,t-2}$				0.061 (0.02)**	
$(Threat)_{kd,t-3}$				0.016 (0.00)*	
$\log(m_{pdt})$		0.045 (0.02)**	0.056 (0.02)**	0.054 (0.02)*	0.054 (0.02)*
$\log(\text{revenue})_{fdt}$		0.028 (0.00)***	0.021 (0.00)***	0.020 (0.00)***	0.020 (0.00)***
$\log(\text{revenue})_{ft}$		0.108 (0.00)***	0.096 (0.00)***	0.114 (0.05)***	0.114 (0.05)***
$\log(\text{employment})_{ft}$			0.035 (0.01)***	0.039 (0.01)***	0.039 (0.00)**
Country-year dummies	Yes	Yes	Yes	Yes	Yes
Firm-product-destination fixed effects	Yes	Yes	Yes	Yes	Yes
R ²	0.17	0.23	0.29	0.29	0.29
Observations	443253	443253	343252	343252	343252

Source: Authors' analysis based on data described in the text.

Notes: p denotes six-digit HS product, k denotes three-digit ISIC industry, f denotes firm, d denotes destination, and t denotes time in years. Standard errors are in parentheses (clustered by firm-product combinations). ***, **, and * indicate the level of significance at 1%, 5% and 10%, respectively. All specifications include a constant term that is suppressed.

Regarding the effect of potential AD duties, the positive coefficient of the retaliation threat variable suggests that Brazilian firms react to potential AD investigations resulting from Brazil's AD activity by increasing the prices of their shipments. In terms of economic magnitude, when Brazil files an AD complaint against the importers in an industry from a particular country, Brazilian exporters increase the price of their exported products within the same industry to the countries named in the complaint by 10 percent because of the risk of retaliation. Although this effect is not comparable to the actual effect of an imposed AD duty, it is commensurate with the pricing effect of the firms' total export sales. In addition, complementing previous studies, the coefficient estimates of the size and revenue variables suggest that larger firms and those that generate more revenue in a destination charge higher prices for product varieties in the same destination. We also find a positive and significant effect of the average product import prices at the export destinations (compared with the rest of the world) on the unit value of Brazilian firms' exports.

In the fourth column of table 5, we report results for the estimates in which we used two additional lags for our policy variables.¹⁸ In terms of the AD duty, the pricing effect is slightly higher for the first and second years after an affirmative AD decision. In contrast, the pricing effect of the potential AD risk decreases in the years after the AD activity, indicating that exporters expect retaliation shortly after their own country's AD activity and decrease the dumping margin more in the first year compared with the following years.

Some readers may question whether our results are driven by the products of the steel and chemical industries because they constitute a majority of the AD cases. To address this concern, we interact our policy variables with steel/chemical and non-steel/chemical dummies. The last column in table 5 reports the estimates for the regressions that include these interaction terms. All of the interaction terms are significant. This result confirms that our results are not driven by particular industry categories. Interestingly, firms in the steel and chemical industries are more reactive to retaliation threats because of the political sensitivity of these industries in worldwide AD activity.

FURTHER DISCUSSION ON RETALIATION

The Role of Export Share

In the previous section, we showed that retaliation threats affect the unit price of the products exported by firms to countries that are subject to AD investigation in the firm's home country. In this section, we will address the argument that potential AD claims in an export destination are not equally important for all firms. Exporting firms for which products in a particular industry in the

18. Instead of using the AD duty in force, which is one until the duty is revoked, the AD variables are now defined as follows: AD duties for one year or two years after the affirmative AD decision.

target country constitute a significant share of exports are more responsive to the risk of retaliation. Therefore, to reduce exposure to retaliation, these firms would be expected to decrease the dumping margin more than firms with smaller export shares for the same product group in the target country. To test this hypothesis, we first create a variable to measure the export share, which is calculated as the ratio of the firm's (f) export sales of products within the particular three-digit ISIC industry (k) in a particular country (d) to the firm's (f) total export sales. Second, we include an interaction term between the dummy variable that denotes the risk of retaliation and the measure of the export share in our specifications.

As shown in the first column of table 6, we obtain a significant estimate for the interaction term. The retaliation threat variable also remains significant. This result suggests that the pricing effect of the retaliation threats is significantly increasing in the share of the exports of the named industries' products in the target country. To gauge the economic significance, consider a one standard deviation increase from the mean in the export share of the firms' products that are exposed to retaliation. Such an increase would be associated with a 3% increase in the unit price of the exported products to the same country.

Exporters Serving Richer Countries

Do firms that export to developed countries have more exposure to retaliation? The abstract in Hansen and Nielsen (2009) notes:

The GATT/WTO rules allow for antidumping measures if domestic producers, exposed to price discrimination, also demonstrate injury where price-undercutting is an important indicator of the latter. The paper shows that the procedure for calculating injury is flawed due to negligence of quality differences in the calculation of the margin price-undercutting. This gives countries with high quality producers an option to practice protectionism. This asymmetry between countries in ability to implement antidumping measures predominantly favors the developed countries which are specialized in producing high quality products.

This critical view of AD investigations has important implications for our research question. Firms that export to developed countries experience stronger competition in these markets because firms there produce higher-quality products. Because quality differentials are often ignored in the calculation of "fair value," the risk of being subject to an AD investigation is higher in these countries when exporters price discriminate to survive.¹⁹ Following this line of argument, when there is a focus on the threat of retaliation, exporters that serve countries that are richer than Brazil will bear more of the risk of retaliation compared with their counterparts that serve the less-developed world. Consequently, we expect a greater increase in the unit price of exports for firms serving developed markets as a result of retaliation threats.

19. See Vandenbussche and Wauthy (2001) for the same argument.

TABLE 6. Further Information on Retaliation (The Effect of Retaliation Threats on the Unit Price of Exported Products)

Dependent variable: $\log(u_{fpt})$			
	The role of export share	The role of richer countries	The role of heavy AD users
$(ADduty)_{pdt}$	0.182 (0.05)***	0.183 (0.05)***	0.183 (0.05)***
$(Threat)_{kd,t-1}$	0.071 (0.03)**	0.078 (0.03)**	0.093 (0.04)**
$(Threat)_{kd,t-1} \times \text{Export share}$	0.079 (0.04)*		
$(Threat)_{kd,t-1} \times \text{Rich}$		0.059 (0.00)***	
$(Threat)_{kd,t-1} \times \text{Heavy user}$			0.036 (0.01)**
Country-year dummies	Yes	Yes	Yes
Firm-product-destination fixed effects	Yes	Yes	Yes
R^2	0.33	0.31	0.29
Observations	343252	343252	343252

Source: Authors' analysis based on data described in the text.

Notes: To save space, control variables are not reported. p denotes six-digit HS product, k denotes three-digit ISIC industry, f denotes firm, d denotes destination, and t denotes time in years. Standard errors are in parentheses (clustered by firm-product combinations). ***, **, and * indicate the level of significance at 1%, 5% and 10%, respectively. All specifications include a constant term that is suppressed.

To examine this issue, we include an interaction term between our policy variable and a binary indicator, “Rich,” which takes a value of one if the destination country is classified by the World Bank as a “developed country.” The coefficient estimates for this specification are reported in the second column of table 6. Both the interaction term and the variable of interest are statistically significant. This result demonstrates a greater reaction to a threat of retaliation from exporters that serve developed countries.

In terms of the magnitude of the effect, there is a 14 percent increase in the unit price of firms’ exported products to rich countries because of the threat of retaliation within an industry that is subject to AD filing in Brazil.

Exporters Serving Heavy AD Users

Although AD policy is a global phenomenon, some countries’ AD activity levels are significantly higher than others. For instance, Japan, which filed the first AD investigation in 1982, only filed six AD petitions before 2000. Conversely, India, one of the most recent adopters of AD law, has become the heaviest AD user in the world. Obviously, the likelihood of retaliation is higher for firms serving heavy AD users. Given this higher risk, firms might be more responsive to the threat of retaliation in these countries.

To investigate whether the destination country’s AD activity affects the export prices of the products of firms that are exposed to retaliation, we interact our variable of interest with another dummy variable, “Heavy,” which takes a value of one if the destination country’s total number of AD filings is higher than the world average over the previous five years. The regression estimates obtained using this variable are reported in the last column of table 6. Similar to the earlier estimates, both the retaliation-threat variable and the interaction term are statistically significant. This result suggests that the increase in the unit price of products from exporting firms that are susceptible to retaliation is higher in export destinations that are heavy AD users. In terms of economic significance, there is a 13 percent increase in the price of products that firms export to heavy AD users when these countries are defendants in Brazil’s AD investigations within the same industry.

CONCLUSION

AD has become the most frequently implemented nontariff trade barrier. After the inception of the WTO in 1995 and the dramatic tariff cuts that countries experienced, the importance of AD duties increased for firms that seek alternative instruments of protection. Because AD duties are very large compared with most favored nation tariffs, they have a dramatic impact on both dumped imported varieties and domestic production. In this study, we analyze one dimension of this impact and contribute to the literature by investigating the pricing effect of AD duties in two ways. First, using rich, four-dimensional trade data, we show that AD duties imposed on Brazilian exporters significantly

increase the unit value of firms' exported products. Second, we document a significant price increase for the exported products stemming from potential AD duties. This finding demonstrates that exporters are willing to avoid the threat of retaliation by decreasing their dumping margins in a particular country with importers that are named in AD petitions in the exporters' home country. We also show that the pricing effect of retaliation threats is increasing in firms' shares of each industry's product in their total exports. This price increase is higher for exporters serving the developed world and heavy AD users.

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