Protectionist Measures in the Agriculture Sectors: Perishability and Competition.

Kathy Baylis[1], Nisha Malhotra[2] and Horatiu Rus[2]

[1]Food and Resource Economics, University of British Columbia

and Department of Agriculture and Consumer Economics, University of Illinois

[2]Department of Economics, University of British Columbia, Vancouver, BC

Abstract

In this paper we compare the use of antidumping (AD) measures in the agriculture sector by Canada and the United States, the two major users of antidumping procedures.[1] We consider both the direct and indirect effects of the AD measure, and consider what factors make an AD measure more or less successful at impeding trade, and when it is more likely to cause trade diversion. Specifically, we ask when the imposition of an antidumping duty restricts imports of the targeted commodity and when is there a deflection in the supply of imports from countries named in the petition to countries not named in the antidumping petition? We compare these results for that of the United States and draw conclusions about the determinants of such differences, like the exchange rate, GDP and distance to partner countries. We use a modified version of the gravity model, as used in the earlier literature (Prusa, 2001) for our analysis. We find that affirmative AD cases caused trade diversion from non-named countries for agricultural products in general, but that trade diversion was particularly strong for perishable products. We also find that the more concentrated the imports, the more restrictive the AD duties.

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[1] Looking at the agriculture sector US and Canada filed 35% of the total AD Cases; they also have nearly 50% of the world's agriculture AD measures in place.

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INTRODUCTION

Antidumping (AD) has long been used as a measure to give domestic producers protection from imports. Recent trade literature has noted that these bilateral measures can not only restrict imports from the named country, they can cause imports to increase from un-named exporters (Baylis and Perloff, 2007; Gulati and Malhotra, 2006; Chad Bown and xx JIE). Further, trade diversion may completely offset the intended price gains from the trade barrier, or be so small as to have no discernible effect. A regular tariff measure, such as the most favored nation tariff, restricts imports from all foreign firms, and the resultant rents generated from higher domestic prices accrue to the home producers.[2] However, contingent protection, such as AD, safeguard measures or countervailing duties, are firm specific[3]. In case all foreign firms (or countries) face antidumping duties, the rents from the higher domestic price accrue to the domestic industry. In the more common case though, a subset of countries or firms is excluded from antidumping duties, and in case these excluded ("non named") foreign entities replace the restricted exports they share the tariff-rents jointly with the domestic producers. Moreover, if trade is completely diverted to non named countries, domestic producers are excluded from sharing these rents.

However, there is still a strong demand for contingent protection, implying that, at least in some cases, the effect of the direct protection supersedes the trade diversion. Exactly what causes some AD measures to have large direct and/or indirect effects is unknown. In this paper, we analyze whether U.S. and Canadian Anti-Dumping (AD) duties in the agricultural sector are effective in restricting trade. More specifically, does the imposition of an antidumping duty restrict imports of the named commodity or is there a diversion in the supply of imports from countries named in the petition to countries not named in the antidumping petition?

A vast literature (Prusa, 1997; Prusa, 2001; Vandenbussche et al (1999), Malhotra and Rus (2008)) has sought to measure the effectiveness of antidumping legislation by aggregating over all commodities (industrial and agricultural). There are only a few papers (Malhotra et al. (2008)

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[2] Tariff revenue also accrues to the importing government. For this paper, we assume that these rents are small, and ignore their general equilibrium effect.
[3] Firm specific even within an exporting country.

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that have empirically tested the effectiveness of antidumping policy in the agriculture sector. (Malhotra et al. (2008) point out that the agriculture sector is inherently different from the manufacturing sector, in terms of seasonality and perish ability, and thus should be studied separately. Utilizing US data for the agriculture sector, they find antidumping duties to have a significant impact on agricultural imports from named countries. They do not find any evidence of trade diversion further highlighting the differences across the two sectors: previous studies, Prusa (1997), for the aggregate US data find strong evidence of trade diversion. Malhotra et al (2008), measure the trade effects of antidumping in the agriculture sector, but fail to account for the differences in the nature of the goods Our contribution is two fold. First and most importantly, we add to the above study by accounting and measuring the effect of perishability and seasonality of the goods, and concentration of the market; characteristics that sets the agriculture sector apart from the manufacturing sector.[4]   Secondly, this is one of the first papers that analyses the effect of antidumping duties on Canadian agriculture trade.

We consider imports at the 10-digit level, we are able to better control for homogeneity of products. Since agricultural products are seen to be relatively homogenous, and farming is usually assumed to have low barriers to entry, we might expect to see greater trade diversion effects in agriculture. The effect of seasonality (and perishability) is unknown. Seasonality may limit non-named countries' ability to increase exports outside of their marketing window. On the other hand, perishability also means that the importing country cannot arbitrage over time, and therefore may have inelastic demand for the product at any point in time. By contrast, industrial commodities may be stored and shipped at any time of the year without being susceptible to perishability, implying trade diversion effects of AD in manufactured goods possible over both time and space, making these spillovers more difficult to identify.[5]

Fresh agricultural products may have the advantage of an outlet in the event that an antidumping petition is allowed to proceed. For the manufacturing sector, sizing conventions (metric v. standard), voltage differences as well as other product characteristics add complications for finding alternate markets to the United States, and thus a foreign firm is likely to bear the burden of higher duties and still serve the U.S markets. Import restriction would probably be observed

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[5] An obvious exception is electronic and computer components which are upgraded and enhanced frequently.

once the AD duties have had an impact on the production of the good, if any. Fresh agricultural products, on the other hand, have the option of alternate markets (barring health or sanitary regulations) and where none exist, the processing sector may accommodate the removal of the surplus product. This characteristic of the agriculture goods makes it more likely for the foreign firms to bypass the U.S market and look for alternate processing sectors. Thus, if the antidumping duties are restrictive we are likely to observe an impact on imports earlier for the agriculture sector than for the manufacturing sector.

We find that antidumping duties have had a significant impact on the imports of agricultural commodities from countries named on the petition. However, our results also indicate that there was little trade diversion towards countries not named within the antidumping petition. Trade diversion appears more prevalent with perishable products. **We want to make our contributions clear here** Unlike previous literature, we also consider the number of countries exporting the good, and percent of imports that are affected, and find that the more concentrated the imports, the greater the effect of an AD case on the named imports.

Literature Review

There has been a fairly significant literature, both theoretical and empirical, devoted to the effectiveness and ramifications of antidumping investigations upon trading patterns for an importing country, including Prusa (1997), Prusa (2001), Staiger and Wolack (1994), Anderson (1993). We follow the methodology set forth in Prusa (1997) and Vandenbussche et al (2001). Prusa (1997) presents evidence on the effectiveness of antidumping actions in the United States, while Vandenbussche et al determined the effects of European antidumping measures on import flows so as to contrast their results with the ones drawn for US antidumping. Utilizing US data, Prusa (1997) concludes that (i) antidumping duties substantially restrict the volume of trade from countries named on the petition and particularly for those cases where ``high'' duties were imposed and (ii) substantial trade diversion exists from named to non named countries with the diversion being larger the greater the duty. Accordingly, for the US cases, it seems that antidumping laws have the peculiar side effect of benefiting countries and firms that were not named in the investigation, through substantial price and volume increases. In contrast,

Vandenbussche et al (2001) find that little or no trade diversion attributable to the antidumping regime is apparent in the European Union data. They suggest this result may be due to (i) differences in industry concentration levels, (ii) the ``prospective'' nature of antidumping legislation, as well as the differences in the calculation of penalties and (iii) the lack of transparency and the larger extent of uncertainty with respect to protection offered in Europe, which prevent non-named firms or countries from filling the ``gap'' created in the export market by the trade restriction effect of antidumping.

BACKGROUND ON ANTI-DUMPING

United States

Under article VI of the General Agreement of Tariffs and Trade countries may impose duties on imports from a particular country or set of countries to protect domestic industries if it is deemed that these imports are being dumped. Dumping is defined as selling a product in the United States at a price lower than cost, or lower than the price for which it is sold in the home market. In case there are no comparable home market sales, sales in a surrogate ``third country'' may be used. In the absence of sufficient home market and third country sales a ``constructed value'', which uses a cost-plus-profit approach to arrive at normal value is used. An interested party[6] may file an antidumping petition with the International Trade Administration (ITA) and the International Trade Commission (ITC) alleging that the domestic industry has been materially injured or threatened with material injury by dumped imports. The ITA determines whether and to what extent dumping has occurred while the ITC determines whether the domestic industry has suffered material injury as a result of dumped imports. In the event that the petition is accepted by both the ITC and ITA, an antidumping investigation is initiated.

The petitioner must file on behalf of the entire industry and the ITA subsequently forwards a questionnaire to the non petitioning producers to determine the extent of support for the petition. If both the ITA and the ITC make affirmative findings of dumping and injury, an anti dumping duty equivalent to the dumping margin is imposed on imports of that product from the country of

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[6] Interested parties include: (i)a manufacturer, producer, or wholesaler in the US of the product; (ii) a certified union or group of workers that is representative of the industry; (iii) a coalition of firms, unions, or trade associations that represent the industry

the accused. The duties remain in effect until an administrative review is held and the exporter is found to have ceased dumping.

Canada

The legislation governing antidumping, together with the countervailing and safeguard regimes, is the Special Import Measures Act (SIMA), which replaced the previous Antidumping Act (ADA) in 1984. The Canadian legislation was adapted to conform to the multilaterally negotiated World Trade Organization Antidumping Agreement which seeks to harmonize the discipline across members. The policy is implemented in Canada jointly by two institutional bodies: the Canada Border Services Agency (CBSA, formerly under Revenue Canada), which determines whether dumping occurs, and the Canadian International Trade Tribunal (CITT), an independent body which concerns itself mainly with determination of injury to the domestic producers of like-products. The two institutions have separate and complementary duties in an antidumping case and there are strict time guidelines to expedite the process. The CBSA acts on a complaint, and in 30 days determines whether there are sufficient grounds for starting a dumping investigation or whether to drop the case. Following a positive preliminary determination of dumping, the CITT also starts its injury inquiry and has 60 days to collect data, model the ``apparent market'' and take a preliminary decision, while CBSA has 90 days (135 in complex cases) to collect information from all parties involved and give a preliminary decision of dumping. Only at this point (if there was no termination caused by ``no dumping'' or ``no injury'' findings by the two bodies) may temporary duties be imposed. Then the CBSA has another 90 days time slot to refine its dumping calculations, accept possible price.

The two parallel processes culminate with a public hearing by the Tribunal, which after 30 days produces a final injury decision. A positive finding leads to the imposition of antidumping duties on dumped imports, while a negative finding determines the reimbursement of any temporary duties collected. Only now can dumping decision and duties be legally challenged. Imposed duties are removed after a sunset period of 5 years, unless there is a decision by the Tribunal that finds injury due to dumped imports persists. Even though the WTO induces a greater degree of harmonization, this is done mainly by requiring countries to follow stated principles in devising their national AD regimes, such as the determination of normal values, the necessity to prove injury etc., while still allowing for a relatively high degree of national variation. Consequently,

there are still discrepancies in the treatment of antidumping in Canada and that in jurisdictions such as the United States or the EU that alone justify a separate empirical investigation.

Canadian antidumping regime includes a ``two-track" antidumping determination system in place, like in the United States but unlike the EU, with an independent institution (the Tribunal) settling the issue of domestic industry injury. Moreover, unlike the US retrospective system, where duties are collected ex-ante from exporters and reimbursements are made in case of negative dumping or injury decisions, Canada has a prospective system. No AD duties have to be collected if exporters raise their prices to eliminate the dumping margin. At the same time, there is arguably less protection for the domestic industry in Canada, as antidumping determinations are only made if exporters refuse to adapt prices to calculated normal values and full duties are paid only after a definitive decision.

Unlike the United States, Canada applies the *de minimus* principle on a country basis compared to a firm basis, meaning that an individual exporting firm with a dumping margin below the *de minimus* threshold will be named in an antidumping case as long as the country margin exceeds the threshold. One possible effect of this is that the likelihood that trade is diverted to non-named sources that have a potential to expand imports is lower, especially if comparative advantage is national. As shown in the following sections, some of the results of our empirical investigation may be interpreted from the perspective of these institutional and procedural differences in AD legislation.

DATA

Data for US antidumping investigations for the complete period (1991-2002), have been put together using the information provided at the US ITC website (www.usitc.gov) and ITA website (www.ia.ita.doc.gov). We subsequently combed through US ITC reports for these specific cases to obtain the identity of these products at the 10 digit HS level. We use annual trade data disaggregated at the 10 digit HS level for the named as well as the non-named countries. The trade data is obtained from the Foreign Agricultural Trade of the United States (FATUS) database at the USDA website (http://www.ers.usda.gov/data/FATUS/.) Import values were deflated by an import price index obtained from the US Bureau of labor statistics. Data on Canadian antidumping measures were constructed using the report from the Canadian Border

Services Agency's Historical Listing of Antidumping. The accuracy was checked with the Canadian reports on the use of AD to the WTO included in the WTO Antidumping Gateway. The data cover the period between 1990 and 2000. Detailed 10-digit HS-level import data were obtained from Industry Canada. To gather uniform 10-digit HS data, this latter source was complemented with Statistics Canada's online directory of HS codes (?). Trade data for Canada comes from the Statistics Canada database and covers bilateral industry-level trade data. The analysis uses data for agricultural industries (HS1-HS24). The data on country-level macroeconomic variables and geographical variables have been obtained from the World Bank COMTRADE database.

EMPIRICAL MODEL

Our primary objective is to test whether anti dumping duties restrict imports from countries specifically named in a petition and if so, whether imports are diverted to countries that are not named. Employing ordinary least squares estimation, we estimate the following reduced form equation,

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\begin{aligned}
\ln m_{i,t} = & \beta_0 + \beta_1 \ln m_{i,t-1} + \beta_2 \ln dis\tan ce_i + \beta_3 commonlang_i + \beta_4 TA_i \\
& + \beta_5 Perish_i + \beta_6 HHI_i + \beta_7 \ln trade_i + \beta_8 \ln GDP_i + \phi_t year_t \\
& + \delta_0 (N_i * t_0) + \delta_1 (N_i * trendbef) + \delta_2 (N_i * Taft) + \delta_3 (N_i * Taft * affirm_i) \\
& + \delta_4 (N_i * trendaft * affirm_i) + \psi_1 (N_i * Taft * Perish) + \psi_2 (N_i * Taft * HHI)
\end{aligned}
$$

Where $t \in \{-5, -4 -3, -2, -1, 0, 1, 2, 3, 4, 5\}$

The variable $lnm_{i,t}$ represents log of imports for case i at time t. Time t=0 denotes the year that the petition was filed, t=1 is the period of investigation as well as the outcome[7] and t=2 to t=4 representing the years following the final decision. The variable $lnm_{i, t-1}$ is included to control for the initial import size of imports for the countries. We also use variables used in a standard gravity-type equation, which explains the natural logarithm of one country's imports with the log level of income (lnGDP) in its trading partner country and the log of pair-wise distance (lndistance). This specification is augmented with a number of other geographic and economic

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[7] For all the cases, the year of investigation is also the year the final decision was made.

variables to account for other possible trade factors. The list includes a binary variable for a common language (commonlang) to capture cultural proximity, binary variable (TA) to capture regional or bilateral trade agreements between the two countries, and variable (lntrade), equal to the log of the value of the bilateral trade to control for overall openness of a country. One of our contributions to the literature is to analyse how market concentration and perishability of products can help explain difference in trade effects of AD across products as well as across countries. A variable to measure the concentration of imports was created, called the HHI (for the Herfindahl-Hirschman Index). Specifically, this variable measures the country-level market share of imports and helps control for competition in the market. Like the HHI for an industry, the HHI for importers is the square of each country exporter's market share of total imports. Thus, if all imports come from a single exporter, our HHI-exporter variable would be 10,000.[8] The variable perishable is a binary variable that takes the value of 1 for products that are easily perishable. The variable 'affirm' takes the value of 1 for a case if the decision was affirmative and if duties were subsequently imposed.

The variable $Taft$ is a dummy variable that captures the effect after the AD decision, it takes the value of 1 when t=1,2,3, and zero otherwise. Two variables $trendbef$ and $trendaft$ are time trends before t0 (running from 1 to 5) and after t0 (running from 1 to 5) respectively. We also interact 'affirmative' dummy with the above variables to capture the time trend of imports for affirmative and negative cases; and we do this for both named and non-named countries. The perishable and HHI interaction terms are only for those cases with an affirmative finding. Some summary statistics are presented in table 1.

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[8] It is calculated by squaring the market share of each firm competing in a market,

Table 1: Selected Summary Statistics

	All Countries		Named	
	Mean	Std. Dev.	Mean	Std. Dev.
Canada				
ln(imports)	9.34	3.30	12.88	3.72
ln(trade)	14.35	1.79	15.99	1.14
ln(product of GDP)	52.62	1.74	54.00	1.22
Perishable	0.52	0.50	0.42	0.49
HHI_imports	3381.00	2274.35	3650.73	2189.23
United States				
ln(imports)	4.75	5.97	8.79	7.28
ln(trade)	17.09	2.04	18.43	1.58
ln(product of GDP)	55.01	1.91	56.12	1.18
Perishable	0.73	0.44	0.86	0.35
HHI_imports	1439.17	1428.48	1837.00	1804.19

As can be seen, Canadian imports tend to be slightly more concentrated, i.e. from countries with a larger export market share, than the United States. Second, named countries tend to export more of the targeted product, and these products tend to have a higher market concentration. Last, named countries tend to be those who trade more with the complainants.

RESULTS

We use a modified version of a gravity model to consider the effect of an AD case on the log of imports from the named and non-named country to Canada and the United States. We specifically consider exports of agricultural products where one of the 10-digit HIC codes is listed in a AD case. We interact a dummy variable for the named country with various time trend variables and other characteristics to tease out the direct effect versus trade diversion. In table 1, we present the net effects for each variable, taking into account the relationship between the interaction terms. Preliminary results for all countries and the named countries are presented side by side in table 2. Full results of the regression are given in table 3.

Table 2: Net effects ln(exports) for all countries and just for the named country

	All Countries	Named Country
time trend before AD	-0.102	0.042
	(0.018)	(0.055)
Year AD case	0.190	0.578
	(0.087)	(0.322)
time trend after AD	-0.317	0.069
	(0.023)	(0.082)
time trend after AD*affirmative finding	-0.357	-0.169
	(0.037)	(0.161)
Perishable*time trend after*affirmative	0.015	0.003
	(0.017)	(0.062)
HHI_imp*time trend*after*affirmative	-0.358	0.204
	(0.037)	(0.164)

As one might expect, those countries named in an anti-dumping case tend to export more than other countries. In the five years preceding the AD case, the average exporter decreases their exports, while the named country actually increases theirs. The fact that exports of the targeted product are decreasing on average may indicate that the domestic market for the named product is softening over this time period. For the year of the case, imports from both named and non-named countries are higher than usual, although this result is significant only for all countries together.

After the AD case, imports from all countries decreased over the next five years. Interestingly, imports from named countries increase slightly each year for five years after the AD case. However, if there is an affirmative finding, imports from all countries increase, while imports specifically from named countries decrease. Thus, we see trade diversion when there is an affirmative finding. If the products are perishable in nature, we see an even larger direct effect of an affirmative AD case, and a larger effect of trade diversion. A concentrated importer market decreases the amount of exports from both named and unnamed countries after an affirmative AD case by about the same amount. Thus, we do not see market concentration affecting trade diversion. However, market concentration appears to amplify the direct effect of the AD case.

Other results of note are that, like previous studies, we find that exports are negatively correlated with distance between the two countries, and positively correlated with the product of the GDP of the two partners. Transaction costs also appear to matter: where countries have the same language, there is more trade. Similarly, bi-lateral and regional trade agreements facilitated trade in these agricultural products. In general, there was a lower value of perishable products, which makes sense given that these agricultural products are raw products with little value added. Last, as one would assume, the more concentrated the imports, the higher the value from any one exporter.

We also considered whether Canada and the United States behave differently. Initial results indicate that Canada seems to experience a greater degree of trade diversion than the United States. After an affirmative AD case, the average imports of that product increase to Canada, more than they increase to the United States (full results in table 4).

One limitation of this study is that we are only looking at products where there is an AD case, thus, we do not control for those factors that lead to an AD case being filed. Therefore, we do not take a formal difference-in-difference approach.

Table 3: Results of regression on ln(exports)

ln(imports)	Coef.	Std. Err.
ln imports (t-1)	**0.667**	0.004
Named country (1 = named)	**0.979**	0.146
ln distance between exporter and importer	**-0.164**	0.056
time trend	**-0.018**	0.006
Common Language (1=yes)	*0.102*	0.054
Trade agreement (1=yes)	**0.757**	0.097
ln (value of trade)	0.003	0.026
ln (product of real GDP of importer and exporter)	**0.062**	0.027
Perishable (1=yes)	**-0.611**	0.055
HHI_imports	**0.066**	0.016
time trend before AD	**-0.076**	0.015
time trend before AD*named country	**0.145**	0.057
Year AD case	**0.239**	0.088
Year of AD case*named country	0.388	0.337
time trend after AD	**-0.298**	0.023
time trend afer AD*affirmative finding	**0.317**	0.077
time trend after AD*named country	**0.385**	0.085
time trend after AD*named country*affirmative finding	-0.253	0.177
named country*affirmative finding*after	0.005	0.310
Perishable*time trend after*affirmative	**0.301**	0.028
Perishable*time trend after*named*affirmative	-0.145	0.164
HHI_imp*time trend*after*affirmative	**-0.160**	0.040
HHI_imp*time trend*after*affirmative*named	0.015	0.140
Constant	0.272	0.946

Bold implies significantly different from 0 at the 5% level

Table 4: Results of ln(exports) comparing Canada and the United States

Lnnomimp	*Coef.*	*Std. Err.*
Canada dummy (1=Canada)	**1.841**	0.101
ln nominal imports (t-1)	**0.648**	0.004
Named country (1 = named)	**1.161**	0.146
ln distance between exporter and importer	**-0.229**	0.056
time trend	**-0.022**	0.006
Common Language (1=yes)	0.085	0.054
Trade agreement (1=yes)	**0.613**	0.096
ln (value of trade)	**0.077**	0.026
ln (product of real GDP of importer and exporter)	**0.073**	0.027
Perishable (1=yes)	**-0.552**	0.055
HHI_imports	0.000	0.000
time trend before AD	**-0.064**	0.016
time trend before AD*named country	**0.139**	0.057
Year AD case	**0.313**	0.087
Year of AD case*named country	0.273	0.335
time trend after AD	**-0.243**	0.023
time trend afer AD*affirmative finding	**0.386**	0.077
time trend after AD*named country	**0.316**	0.084
time trend after AD*named country*affirmative finding	-0.210	0.176
named country*affirmative finding*after	-0.153	0.309
Perishable*time trend after*affirmative	**0.267**	0.028
Perishable*time trend after*named*affirmative	-0.155	0.163
HHI_imp*time trend*after*affirmative	**0.000**	0.000
HHI_imp*time trend*after*affirmative*named	0.000	0.000
Canada*after*affirmative	**0.498**	0.246
Canada*after*affirmative*named	-0.448	1.834
Constant	-1.024	0.943

CONCLUSIONS

In this paper, we consider the effectiveness of AD duties in terms of limiting trade from the named country, and in spurring trade from other exporters. We find that in agricultural products, affirmative AD cases do appear to lower exports from the named country. The more concentrated the export market, the greater the effect of the AD case on reducing imports. Second, we find that affirmative AD cases cause an increase in exports from non-named countries. This trade diversion effect is particularly strong for perishable products. Thus, we find similar results to Prusa in terms of AD leading to trade restrictions and trade diversion, although we are able to attribute some of the trade diversion to specific product characteristics.

We also find interesting results in terms of a failed AD case – i.e. one in which there is a negative finding. In the five years following these cases, the named countries actually increase their exports of the targeted product, even though there is no evidence that they were reducing those exports during the investigation. Thus, we do not see evidence of the "threat" of an AD case reducing future exports in agricultural products.

Although very preliminary, we also find some evidence that trade diversion is more prevalent in Canada than in the United States for agricultural products. Thus, like Vandenbussche et al's findings for the EU, we find that there appears to be differences between countries in terms of the effect of AD cases.

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