Korea and the World Economy, Vol. 14, No. 3 (December 2013) 417-446

Disproportionate Patterns of Retaliatory Antidumping Filings by Developing and Developed Countries*

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Using global antidumping cases for 72 manufacturing sectors, in 28 countries from 1991 to 2006, we investigated whether there are different patterns of retaliatory antidumping duties (AD) between the developed and developing countries. We find that the four traditional AD heavy users, which are the developed countries, such as Australia, Canada, EU and US, tend to be more sensitive to initiated AD than measured AD of exporting countries, while the five new AD heavy users, which are the developing countries, such as Argentina, Brazil, India, Mexico, South Africa, tend to be more sensitive to measured AD than initiated AD. However, the disproportionate reactions of countries disappear for the period of 1998-2006, which implies an institutional learning from past experience of retaliatory AD. For the whole period, we also find that it disappears only at the country level.

JEL Classification: F13

Keywords: antidumping filings, retaliation, developing countries, probit regression, institutional learning

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* Received August 7, 2013. Revised November 8, 2013. Accepted November 11, 2013. This work was supported by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-332-2011-1-B00067).

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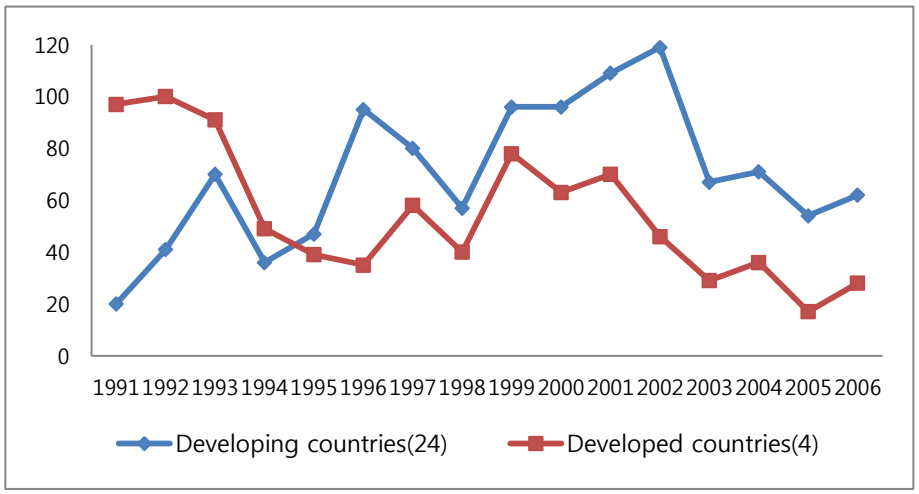
1. INTRODUCTION

One of trade barriers, which many countries have often used for the purpose of protecting domestic markets, is antidumping duties (AD). Antidumping duties are imposed on imported dumping products when the government of an importing country finds imports of the products as one of the causes of damages in the competing domestic industries.

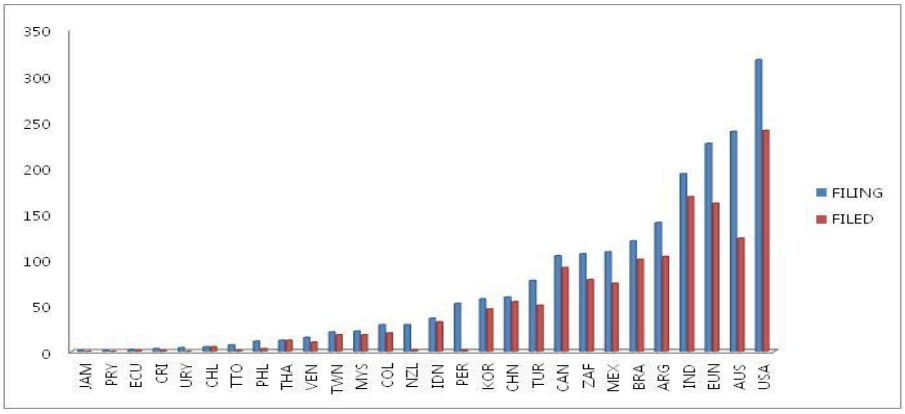
These days, the AD has been a popular tool for protection used by not only developed countries, but also developing countries. According to *Global Antidumping Database* (Bown, 2007),[1] we may observe that there is a different trend of antidumping actions among the different group of countries — developing and developed countries. Figure 1 shows that the numbers of antidumping filings made by developed countries have decreased over time, whereas developing countries have filed AD cases increasingly, over the same period. In the beginning, the developed countries made the cases 5

Figure 1 Antidumping Duties of Developed and Developing Countries From 1991 to 2006



[1] We use information on antidumping cases from the *Global Antidumping Database* (Bown, 2007). The data can be found at http://people.brandeis.edu/~cbown/global_ad/ad.

Figure 2 Cumulative Numbers of Antidumping Duties Filings and Being Flied across Countries



times more than the developing countries. This trend was reversed after 1995. Since then, the developing countries have reported the antidumping cases more than the developed countries.[2)]

Figure 2 shows that cumulative numbers of antidumping filing cases and cases being filed for 28 countries used in our analysis. As you observe, we found a high correlation between filing and filed cases for all countries. The high correlation has been studied by Prusa and Skeath (2002), and Feinberg and Reynolds (2006) where they interpreted it as evidence of strategic or retaliatory usage of AD filings by an importing country against exporting countries who filed AD case frequently, as well. However, they did not distinguish the AD patterns between developed and developing countries. Figure 3 demonstrate that the correlation of AD filings and being filed can be observed at the level of industry.

In our paper, we examine the different patterns of AD filings of different group of countries at the level of industry and countries both. To contrast clearly different patterns of AD among the developed and developing countries, we will divide the 28 countries into two groups. One group is the

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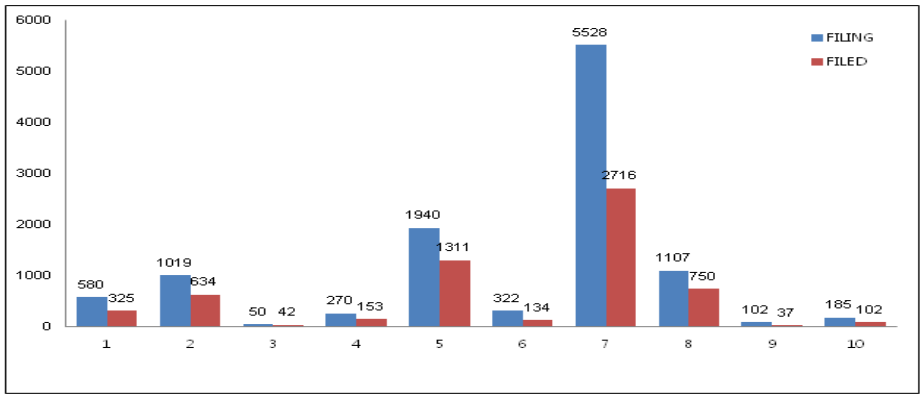
[2)] It may be because developing countries started to have their own anti-dumping laws and policies since mid-1990s.

Figure 3 Cumulative Numbers of Antidumping Duties Filings and Being Flied across Industry



Note: The numbers in the x-axis indicate industries as follows: 1 - Food & Beverages, 2 - Apparel, Textiles & Leather, 3 - Wood Products of Wood and Furniture, 4 - Pulp, Paper and Paper Products, 5 - Chemicals, Synthetic Rubber & Plastics, 6 - Ceramic Ware, Cement & Glass Products, 7 - Basic Metal Products, 8 - Engines, Machinery and Equipment & Electronic Components, 9 - Motor Vehicles & Transport Equipment, 10 - Spectacle, Photographic Equipment and Other Optical Instruments & Other Manufacturing.

4 traditional AD heavy users[3)] such as Australia, Canada, European Union and the United States, and the other group is the relatively new AD users, that is, the remaining 24 developing countries. We attempt to observe strategic or retaliatory actions against AD initiations and implementations between the two groups at the level of industries and countries both.

Indeed, our empirical study in this paper shows that there are some noticeable different patterns of AD actions between them, at the industry level data. In particular, we find that the developed countries, such as Australia, Canada, EU and US — the traditional AD users — react more sensitive to the 'initiated' antidumping filings than the 'imposed' duties, whereas the

[3)] Note that the 4 traditional AD users are similar to ones in the previous two studies of Prusa and Skeath (2002) and Feinberg and Reynolds (2006) except for New Zealand. For new AD users, Prusa and Skeath (2002) found a growing number of AD uses from countries such as South Africa, Brazil and Mexico, while Feinberg and Reynolds (2006) observed China, Korea, Taiwan, India and Indonesia as leading targets of AD petitions and termed as new(or non-traditional) AD users. Unlike these two studies, we include more numbers of AD users from developing countries.

developing countries — the relatively new AD users — show their retaliatory actions at the final stage of antidumping decision. Our explanations are as follows. The developed countries might accurately calculate the damage of the AD even at the stage of initiation, and hence, tend to be quick to respond an AD of exporters. The developed countries are 'traditionally known' AD heavy users who have a lot of experiences of AD filing and being filed. However, unlike the traditional AD users, these new AD users are not well aware of the implication of AD initiation, the threatening role and consequences of AD. Thus, they tend to delay their retaliatory reaction until the damages of AD are clearly imminent. Hence, their retaliatory actions are likely to be made after the implementation of AD, not at the stage of initiation of AD.

In fact, a presence of retaliatory nature of AD use has been examined in the empirical literature. Prusa and Skeath (2002) showed that a strategic motivation of traditional AD users (Australia, Canada, the EU, New Zealand and the US) and new AD users (South Africa, Brazil and Mexico) might be an important factor for the uprising trend of AD observed during the period from 1980 to 1998. They observed from both groups of AD heavy users that most AD filings were carried out against those countries, which have filed AD before. Blonigen and Bown (2003) suggested a theoretical model of reciprocal dumping with a policy of antidumping duties and examined the US antidumping duties. They found that the US's uses of antidumping measures were dampened by other countries' retaliatory actions during the years from 1980 to 1998.[4)] Francois and Niels (2006) showed that the probability of AD filings of Mexico is higher for countries that filed against Mexico before than for those countries which did not. Feinberg and Reynolds (2006) confirmed statistically significant results on the retaliatory response of exporting countries that had experienced of being filed as dumping countries by the governments of importing countries, using cross-

4) However, Bao and Qiu (2009) showed somewhat contrasting evidence from AD behaviors between US and China. They compared the AD of US and China for the period from 1991 to 2005 and discovered that China was no more retaliatory than the US.

country panel data covering 41 countries over the years from 1995 to 2003. Among many results in their paper, we note that they have found different retaliatory behavior between traditional (Australia, Canada, the EU, New Zealand and the US) and non-traditional, new AD users (China, Korea, Taiwan, India and Indonesia). That is, while the retaliatory effect of the traditional users is no longer statistically significant, there is a greater probability of carrying out retaliatory AD of the new users against the traditional users.

In line with these literature, our paper attempts to reveal different nature of retaliatory motive between the different AD heavy user countries. Our main question is whether there is any distinctive pattern of retaliatory actions at initiation stage and final stage of AD decision process from the two groups of AD users. We divide them into two groups; the traditional heavy AD users (Australia, Canada, the EU and the US) versus the 24 developing countries who are new heavy AD users. Using global antidumping cases for 72 manufacturing industries in 28 countries from 1991 to 2006, we first found that the developed countries react more sensitively to the 'initiated' antidumping tariff than the 'imposed' dumping investigation, whereas the 24 developing countries show their retaliatory actions at the final stage of antidumping decision. Second, such a disproportionate behavior disappears at the country level data.

Apart from the retaliatory patterns of AD filings, the macroeconomic factors, such as exchange rates, GDP growth rate and trade liberalization, have been traditionally known as important economic determinants in the empirical AD literature. Feinberg (1989), in the earliest work, examined the effect of exchange-rate changes on US antidumping filings across four import source countries (Brazil, Japan, South Korea, and Mexico) over 24 quarters from 1982 to 1987. He showed that depreciation in the US dollar against foreign currencies makes import prices lower, which eventually leads to an increase in the number of antidumping investigations. Knetter and Prusa (2003), for developed countries (Australia, Canada, EU, and US) over the years from 1980 to 1998 revisited this issue of exchange rates, and have

reported different findings: a positive relationship between appreciation in the domestic currency and the number of antidumping filings against the exporting countries. That is, when a domestic currency is appreciated relative to a foreign currency, a foreign exporting firm's cost, in terms of the domestic currency will be lower and the firm will lower the price of exported goods. This will lead to an increased likelihood that the foreign firm is found to cause industrial damage in the importing market, and thereby, an increased number of antidumping investigations. In addition to the exchange rate as a determinant of AD, they also found that a decline in the GDP growth rates of filing countries led to an increase in antidumping activities, which is consistent with an earlier work by Leidy (1997), who used a smaller sample of US aggregate filings. Bown (2008) considered 9 developing countries over the years from 1995 to 2002 and found that the developing countries also used AD to protect their domestic markets when their macroeconomic conditions were deteriorated (i.e., appreciation of domestic currencies and decreases in GDP growth rates).

The empirical AD literature also found evidences that trade liberalization or openness at country level has influenced the use of AD in many countries. Using a panel data on 99 countries between 1980 and 2000, Aggarwal (2004) examined how changes in tariff rates influence the use of antidumping duties, and found a strong evidence of the negative correlation between the changes in the average tariff rates and the antidumping filings in the developing countries. Feinberg and Reynolds (2007) showed that trade liberalization, due to the Uruguay Round, seems to make developing countries use AD more frequently. Bown and Tovar (2010) focused on the case of India, and also confirmed a negative relationship between tariff reductions and the use of AD. Moore and Zanardi (2006) also examined the use of AD of 35 countries, and asked whether the regulations against dumping further improve tariff liberalization. They found that there indeed was a positive role of AD in reducing tariff levels in the developed countries, in particular. For our empirical analysis on the retaliatory patterns of AD filings, we will control these macroeconomic variables, such as exchange rates, GDP growth

rate and trade liberalization. In this paper, we emphasize the different patterns of strategic use of AD between the developing and developed countries.

This paper is organized as follows. Section 2 describes the method of constructing dependent and independent variables for our empirical analysis. It also briefly refers to the choice of regression methodology, and predicts the effect of each regressor on the dependent variable. Section 3 reports the empirical regression results. It highlights the main findings on different patterns of antidumping practices, between the developed and developing countries. Section 4 summarizes the results and provides recommendations for future research in the literature of AD.

2. THE METHODOLOGY: INITIATED AD INVESTIGATION VERSUS IMPOSED AD DUTIES

When foreign exporters dump their products in domestic market with a lower price than their local price (or average costs), and thus, the imported foreign goods generate material injury to domestic industries in an importing country, the government may investigate the cases filed by domestic competitors (we call this as 'initiated' cases) and then impose antidumping duties against the foreign exporters, in order to protect the domestic markets (we call this as or 'imposed' or 'measured' cases).

Using the cases of antidumping duties, initiated or imposed by importing countries, we will analyze strategic and economic factors that increase the likelihood of using AD against exporters. In particular, as in the previous empirical AD literature, we use a probit model as follows.

$$P[y_{ijt}^{k}=1]=F[\alpha+\beta_1 INITIATION_{ijt-1}^{k}+\beta_2 INITIATION_{jit-1}^{k}$$
$$+\beta_3 INITIATION_{jot-1}^{k}+\gamma' X+\theta_t+\theta^{k}],$$

$$P[y_{ijt}^{k}=1]=F[\alpha+\beta_1 MEASURE_{ijt-1}^{k}+\beta_2 MEASURE_{jit-1}^{k}$$
$$+\beta_3 MEASURE_{jot-1}^{k}+\gamma' X+\theta_t+\theta^{k}].$$

The dependent variable y_{ijt}^{k} takes value one when an importing country *i* has 'initiated' antidumping investigations for industry *k*, at least once, against an exporting country *j* at time *t*, otherwise zero.[5] The main database for antidumping initiations and measures is supplied by Bown (2007), *the Global Antidumping Database*. We use the cases of 72 4-difit manufacturing industries of 28 countries during the period from 1991 to 2006. The list of countries is provided in Appendix A1.

Note that, the following previous literature we used is cases of 'initiation' for the dependent variable. This is because the literature has recognized that AD initiation itself can play a role of threatening the exporting countries and exporters even before AD duties are actually imposed. Domestic industries that are allegedly hurt by the dumped foreign goods are ones that actually bring the cases to government authorities. In order to get protection from AD, they should submit documentation that proves the price gaps between domestic and dumped products, and industrial damages due to the dumping activities of foreign firms. This is the stage of 'initiation'. Then, the relevant government authorities begin the investigation for the cases and decide whether the industrial damage is actually substantial. Usually, it takes a long time (a number of months or even a few years) between initiation and actual imposition. Note that, according to our data sample, the total number of initiation is 86,923, while the total number of AD imposition is 39,388.

In the first regression model, $INITIATION_{ijt-1}^{k}$ is the number of AD

[5] In fact, AD investigation occurs at the industry level, at least in the US, against all foreign exporting firms regardless of their nationality. If this is true for most of countries using AD policy, it will be hard to single out a country for retaliation based on AD duties. However, since we consider 28 countries using different AD policies including many developing countries, we assume that this may be not true for our dataset. Also, even if AD investigation occurs against all foreign firms, it is possible for a country to 'internally' decide to retaliate against some targeted countries.

initiation conducted by the government of an importing country *i* against an exporting country *j* in industry *k*, at time *t*–1. This variable captures a statistical possibility that a country that has initiated dumping investigation in a previous year may be likely to initiate another AD cases in a current year. One of the reasons for the autocorrelation is because, according to the laws of antidumping duties in most of the countries, there may be continuing AD cases of which the annual administrative review may be carried out upon the request of involved parties.[6] Blonigen and Haynes (2002) found a supportive evidence of such an autocorrelation. In our regression equation, β_1 is positive if there is a tendency of country *i* for AD investigation over time, and negative otherwise.

Our main variable of interest, $INITIATION^{k}_{jit-1}$ is the number of AD initiation conducted by the government of country *j* against country *i* in industry *k* at time *t*–1.[7] The estimated coefficient of this variable may show direct retaliation motive of whether or not the importing country *i* is likely to respond to country *j* by retaliatory AD initiation, at time *t* when the country *j* in the previous year, *t*–1 has initiated the AD investigation against the country *i* for the same industry *k*. We may expect that β_2 is positive (negative) if there is (is not) such a direct retaliatory action of country *i*.

$INITIATION^{k}_{jot-1}$ is the number of AD initiation by the government of the country *j* in industry *k* at time *t*–1 against the rest of the world (indicated by subscript *o*), except for country *i*. That is, this reflects whether country *j* is a frequent AD user or not. It is used in the regression in order to see whether or not the importing country *i* is likely to respond to country *j,* who tends to have frequently initiated the AD investigation against the rest of the world. Even if country *i* did not get any direct AD threat from country *j*, it can

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[6] AD authority may continue to impose the same AD duties in the absence of administrative review, at least in the US. In the absence of administrative review, the AD authority will continue to impose the same AD duties. This case cannot be captured by this regressor.

[7] Note that one year lag does not need for a retaliatory action in reality. However, we follow the idea of Feinberg and Reynolds (2006) justifying immediate retaliatory action. They say that 'most game theoretical models suggest an immediacy of response in order to use retaliation as a means of establishing credibility of threat, or as an effective tit-for-tat mechanism (p. 879)'.

predict that the likelihood of having AD duties from country *j* will be high since country *j* has already used the protective trade policies against the other countries. β_3 is positive (negative) if there is (is not) a tendency of country *i* for initiating AD investigation against a frequent AD user, country *j* in the given industry *k*. A similar variable appealed in Feinberg and Reynolds (2006), as the deterrent factor of AD use of importing countries. However, the variable in their regression was interacted with a share of importing country *i*'s total exports to that country, *j*. Since we do not have a balanced panel dataset, we are not able to use the weights for any single year. They did by utilizing the year of 1998, which is a single mid-sample year. Nonetheless, we will interpret it as a deterrence factor for a use of AD.

In the second regression, we use the AD cases 'imposed', indicated by $MEASURE^k_{ijt-1}$, $MEASURE^k_{jit-1}$, and $MEASURE^k_{jot-1}$. These data are available from the *Global Antidumping Database*. By comparing the results from the first and the second regression models, we will examine whether a country would respond to an actual imposition of AD duties or to an early stage of AD investigation. The fact that a country retaliates against the other country that actually 'imposed' AD implies that the retaliating country has waited until the final decision of the other country has made. In this case, the retaliating country can obtain the exact information regarding the actual level of AD. Without knowing the level of AD duties, the retaliatory AD level might be too high or too low, compared to the foreign AD duty. If it is too high, it can be suspicious of a 'retaliation' case. If it is too low, the case is not working properly as a threat at all. In both cases, the effectiveness of retaliatory AD is reduced. Hence, we expect that, if importing countries know costs implication of AD initiation correctly, maybe due to learning from a past historical experience of having had AD, then it may respond to exporting countries' AD initiations immediately. Otherwise, importing country may wait until the final decision for AD imposition is delivered, and then, respond to the AD imposed. The former case supports a retaliatory action occurred at the stage of AD initiation (showing significantly positive value of β_2 in the first regression model) and the latter case would indicate

a retaliatory motivation at the final stage of AD imposition (i.e., positive β_2 in the second regression model).

$$P[y_{ijt}^{k}=1]=F[\alpha+\beta_1 INITIATION_{ijt-1}+\beta_2 INITIATION_{jit-1}+\beta_3 INITIATION_{jat-1}+\gamma' X+\theta_t+\theta^k],$$

$$P[y_{ijt}^{k}=1]=F[\alpha+\beta_1 MEASURE_{ijt-1}+\beta_2 MEASURE_{jit-1}+\beta_3 MEASURE_{jat-1}+\gamma' X+\theta_t+\theta^k].$$

While in the previous two regression models we examine the existence of industry-specific retaliatory motives, now we will try to estimate country-specific retaliatory AD; whether or not it is likely that the retaliatory ADs are made between the countries. The retaliation does not need to be industry-to-industry. For this analysis to be carried out, we aggregate the data at country level and use $INITIATION_{jit-1}$ for the initiation cases, and $MEASURE_{jit-1}$ for the imposed cases. The other two variables, reflecting autocorrelation and deterrent effect of AD at a country level, are also used as in the above two regression models.

For the other control variables in *X*, in all regression equations, we use GDP per capita, bilateral real exchange rate, and import shares. First, the GDP per capita, $gdpc_{it-1}$ is a real GDP per capita of the importing country, at time *t*–1. The real value is calculated in terms of US dollar, based on the US GDP deflator in 2000. The data are available from the *World Bank Database*. This variable reflects the economic development level. As the importing country's GDP per capita is higher, and hence, its purchasing power is also higher, it may expect to have a gain from protection policies, since the tariff may create terms of trade gain. Hence, as a specific market or industry is damaged by foreign goods imported, the country has an incentive to initiate AD investigation. We expect to have a positive sign for the estimated coefficient. In fact, this macroeconomic variable is often used

in the literature as mentioned in the Introduction. Following the convention in the literature, we use the real value of GDP per capita and try to examine whether countries more frequently use AD policy to protect damaged importing industries as their development levels are higher.

Second, another macroeconomic factor used in the set of our control variables is a bilateral real exchange rate, bfx_{ijt-1}. It is a real exchange rate between country i and country j, at time t–1. Countries' real exchange rates in terms of US dollars in 2000 are available from *International Macroeconomic Data Set* of the United States Department of Agriculture. We divide the exchange rate of exporting country j by the exchange rate of importing country i. As the relative exchange rate is smaller, the importing country's currency is highly appreciated against the exporting country's currency. In this case, country i may import more, and then it may be likely that country i initiates more AD investigation against country j. In the literature, the effect has been confirmed. For example, see Knetter and Prusa (2003).

Third, the other macroeconomic variable we will consider is the trade deficit of a country. We define $SoBT_{it-1}$ as the share of trade deficit out of real GDP for a country i at time t. The data for imports, exports and the real GDPs are from *World Bank*. When a country's trade deficit becomes larger, it is more likely to demand for protection from domestic industries.

Last, as for trade openness at industry level, we use import share, which is the ratio of imports in industry k to the total imports of country i from country j. That is, $imps^{k}_{ijt-1} = imp^{k}_{ijt-1} / imp_{ijt-1}$. The data of imports in industry k of country i from country j are available from *Advanced Query* on TRAINS/IDB of World Bank. This variable shows a country-and-industry specific openness, which measures the degree of import openness of importing country i to exporting country j, in industry k. If the share of imports in an industry becomes larger, it is more likely that the importing country imposes AD duties against the exporting country. Hence, we expect to have a positive sign. One may think of as an alternative country-and-

Table 1 Summary Statistics

Variable	Observation	Mean	S.D.	Min	Max
$INITIATION_{ijt-1}^{k}$	176,863	0.0574512	3.018287	0	922
$INITIATION_{jit-1}^{k}$	176,863	0.0407321	2.652944	0	922
$INITIATION_{jot-1}^{k}$	176,863	0.4822716	14.55074	0	1,681
$MEASURE_{ijt-1}^{k}$	176,863	0.0312445	1.856479	0	551
$MEASURE_{jit-1}^{k}$	176,863	0.0209315	1.240933	0	301
$MEASURE_{jot-1}^{k}$	176,863	0.2192601	7.049549	0	600
$INITIATION_{ijt-1}$	5,138	31.66621	434.5803	0	26,568
$INITIATION_{jit-1}$	5,138	20.3914	220.7985	0	10,064
$INITIATION_{jat-1}$	5,138	317.5257	1456.471	0	18,734
$MEASURE_{ijt-1}$	5,138	59.4817	687.3496	0	33,762
$MEASURE_{jit-1}$	5,138	40.36571	460.1408	0	26,656
$MEASURE_{jat-1}$	5,138	580.6395	2,736.802	0	54,591
$gdpc_{it-1}$	233	0.944242	0.9286912	0.0326627	3.701876
bfx_{ijt-1}	3,768	201.6495	1,129.089	0.0000323	18,733.34
$SoBT_{it-1}$	246	0.0072699	0.2482237	–2.86E-01	2.805554
$Imps_{ijt-1}^{k}$	54,390	0.0005649	0.0027389	1.95E-12	0.13927

industry specific openness, a tariff rate.[8] However, the AD is not just initiated simply because the tariff rate is low. What is more relevant for our study of strategic use of AD is a surge of imports into a country, in a particular industry; hence, we decide to use the import share, instead of the tariff rate, for the trade openness variable.

Dummy variables for year and industry (4-digit ISIC) are also included in the regressions to control for unobservable industry- and year-specific differences. Table 1 presents the summary of statistics for all the explanatory variables. First, the mean values of the variables,

[8] One may also use financial openness instead of trade openness if there is a complementarity between the two. The complementarity has been studied by Aviat and Coeurdacier (2007) and Shin and Yang (2012).

$INITIATION^{k}_{ijt-1}$ and $MEASURE^{k}_{ijt-1}$ are 0.117 and 0.140, respectively. This implies that there may be a tendency that we may observe a series of AD policies for the same industry over two-consecutive years in a country. We may expect that the mean values should be higher at a country level than at an industry level, due to the aggregation. Indeed, they are 3.136 and 1.670, respectively. Second, the mean values for the retaliation variable are 0.123 from $INITIATION^{k}_{jit-1}$ and 0.148 from $MEASURE^{k}_{jit-1}$, respectively. This implies that in a previous year (t–1), an exporting country j initiates AD 0.123 times or imposes it 0.148 times on the average against an importing country i for a given industry k. Hence, given this fact, a result from our regression model would tell us whether the importing country may also use AD policy against the exporting country by initiating or imposing AD in a current year for the same industry. This tendency would be clearer at the country level (i.e., the corresponding values are 2.128 and 1.075, respectively). Third, the deterrence factor may exist in both the industry and country level. At the industry level, an exporting country j initiates (or imposes) 1.454 (1.547) times on average against rest of the world (except for importing country i) in a previous year for a given industry, while it initiates (or imposes) 30.614 (16.742) times in a previous year at the country level. We can check out whether the importing country responds to those countries that have been frequently using AD policies in the world or not. If it does not, it implies evidence that the importing country may fear of being targeted by frequent AD users.

3. RESULTS

3.1. All Country

Table 2 shows the results of the 4 regression equations, and we present marginal probability effects of each variable on the use of an AD initiation of all pairs of countries. We first take a look at the strategic variables.

Table 2 Marginal Effects from Probit Estimation between ALL and ALL

IMPORTER	ALL	ALL	ALL	ALL
EXPORTER	ALL	ALL	ALL	ALL
$INITIATION^{k}_{ijt-1}$	0.00234*** [0.00040]			
$INITIATION^{k}_{jit-1}$	0.00092*** [0.00034]			
$INITIATION^{k}_{jot-1}$	–0.00010*** [0.00004]			
$MEASURE^{k}_{ijt-1}$		0.00162*** [0.00046]		
$MEASURE^{k}_{jit-1}$		0.00240*** [0.00082]		
$MEASURE^{k}_{jot-1}$		–0.00036** [0.00015]		
$INITIATION_{ijt-1}$			0.00063*** [0.00005]	
$INITIATION_{jit-1}$			0.00020*** [0.00005]	
$INITIATION_{jat-1}$			–0.00001 [0.00001]	
$MEASURE_{ijt-1}$				0.00059*** [0.00005]
$MEASURE_{jit-1}$				0.00024** [0.00009]
$MEASURE_{jat-1}$				–0.00001 [0.00001]
$gdpc_{it-1}$	0.00209*** [0.00072]	0.00294** [0.00129]	0.00036 [0.00051]	0.00156*** [0.00052]
bfx_{ijt-1}	–5.E-06** [2.E-06]	–9.E-06** [4.E-06]	–4.E-06*** [1.E-06]	–4.E-06** [2.E-06]
$SoBT_{it-1}$	0.00210 [0.00258]	0.12330*** [0.0321]	0.00126 [0.00209]	0.00199 [0.00209]
$Imps^{k}_{ijt-1}$	1.19012*** [0.21184]	2.03503*** [0.30862]	1.02328*** [0.15508]	1.05115*** [0.15451]
Year Effects	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Number of Obs	23,660	7,969	40,212	40,212
Pseudo R^2	0.146	0.153	0.132	0.121
Log Pseudo Likelihood	–2,466.0829	–1,098.5015	–3,534.8217	–3,581.4360
Obs. P	0.0264	0.0384	0.0208	0.0208
Pred. P	0.0159	0.0216	0.0123	0.0128

Notes: The estimates are marginal probability estimators. Robust standard errors are reported in parenthesis. *, ** and *** are 10%, 5% and 1% level of significance.

First, we can observe a positive effect from an AD initiation of previous year ($INITIATION^{k}_{ijt-1}$). The estimated probability of the country's AD initiation in a current year is 0.23%. It implies that it is likely that a government authority in a country may continue to initiate AD policies for dumping in the same industry when it has initiated a similar AD case in the previous year. Second, we find a retaliatory behavior of AD initiation from the positive coefficient of $INITIATION^{k}_{jit-1}$. That is, when an exporting country j has initiated the dumping investigation against an importing country i for an industry k in the previous year t–1, the importing country is also likely to impose the AD initiation against the exporting country for the same industry in a present year. The estimated probability is 0.09%. Although the probability itself is small, it is economically meaningful given the fact that we found industry-matching retaliatory behaviors. Third, we used $INITIATION^{k}_{jot-1}$ to see the deterrence role of an exporting country's AD against the rest of the world (excluding the importing country i) and found that the estimated probability is –0.01%. This implies that the importing country would not necessarily initiate AD investigation simply because the exporting country is a generally known as a frequent AD user in that industry. Although the probability is extremely small, the negativity of the estimator implies that the importing country is deterred to use AD in the same industry as the exporters used AD more frequently against the rest of the world in that industry. This may be due to a fear of getting targeted by the AD users, in case that the importing country initiated AD investigation against them.

These results hold when we used AD impositions (*MEASURE*) as explanatory variables, instead of the AD initiation. The estimated probabilities are 0.16%, 0.24% and –0.04% respectively. Note that the direct retaliatory behavior seems to be more than 2 times stronger in the estimation result, when we used the AD imposition. We also aggregate the industrial data and see the effect of AD, at the country level. We find similar results: The first two effects hold true at the country level, while the last effect lost its statistical significance. Note that the size of the coefficients gets smaller at the country level than at the industry level. That

is, retaliatory actions are relatively clearer at the industry level data than that of the country level data.

Let us turn to the economic factors. The estimated probability of AD initiation is positive for a richer importing country, for a strong bilateral purchasing power of an importing country's currency, for a larger size of current deficit in an importing country, and for a larger amount of bilateral import share in an industry. Although the estimators are not always statistically significant, these signs are all expected as in the previous literature, and we confirm the results in our analysis, as well.

In sum, we find that the importing countries tend to retaliate against exporting countries, which either initiated or imposed AD at both the industry and country levels. Now, let us examine and compare the AD behaviors of the four traditional AD heavy users (Australia, Canada, EU and US) and the other developing countries to see whether their retaliatory strategies are different between traditional AD heavy users (i.e., 4 developed countries) and the rest of the world (24 developing countries).

3.2. Four Traditional Heavy Users (Australia, Canada, EU, and US)

Table 3 shows the results when we considered only the AD uses of the 4 heavy users; Australia, Canada, EU and US, against all countries (including them).

First, we find that the probability of continuous AD initiation at the industry level is estimated as 0.26%, and the probability of direct retaliation of AD initiation is 0.08%. These are similar results, as in table 2. Second, the estimated probability of $INITIATION^{k}_{jot-1}$ is not statistically significant, although negative. That is, we could not find that they, as importing countries, would decrease their use of AD against generally known, other frequent AD users. Third, when we use the variables of MEASURE at the industry level, none of the estimators of the three variables are statistically significant. This result may imply that the traditional heavy users (the four developed countries) are sensitive, more to the initiated AD than the imposed AD.

Table 3 Marginal Effects from Probit Estimation between DV4 and ALL

IMPORTER	DV4	DV4	DV4	DV4
EXPORTER	ALL	ALL	ALL	ALL
$INITIATION^{k}_{ijt-1}$	0.00266*** [0.00058]			
$INITIATION^{k}_{jit-1}$	0.00088*** [0.00031]			
$INITIATION^{k}_{jot-1}$	−0.00005 [0.00006]			
$MEASURE^{k}_{ijt-1}$		0.00143 [0.00127]		
$MEASURE^{k}_{jit-1}$		0.00184 [0.00232]		
$MEASURE^{k}_{jot-1}$		−0.00014 [0.00015]		
$INITIATION_{ijt-1}$			0.00071*** [0.00009]	
$INITIATION_{jit-1}$			0.00019** [0.00008]	
$INITIATION_{jat-1}$			0.00003 [0.00002]	
$MEASURE_{ijt-1}$				0.00053*** [0.00011]
$MEASURE_{jit-1}$				0.00144*** [0.00043]
$MEASURE_{jat-1}$				−0.00003 [0.00003]
$gdpc_{it-1}$	0.00668 [0.00439]	0.02957*** [0.01073]	0.00150 [0.00292]	0.00635** [0.00294]
bfx_{ijt-1}	−0.01974*** [0.00577]	−0.04045*** [0.0142]	−0.01495*** [0.00452]	−0.01473*** [0.00441]
$SoBT_{it-1}$	0.00690 [0.05321]	−0.19417 [0.12605]	−0.01232 [0.03268]	−0.01761 [0.03602]
$Imps^{k}_{ijt-1}$	1.11381*** [0.41749]	5.24797*** [1.32732]	0.90650*** [0.32295]	1.04623*** [0.36862]
Year Effects	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Number of Obs	5,592	2,052	8,758	8,758
Pseudo R^2	0.210	0.239	0.201	0.179
Log Pseudo Likelihood	−755.6149	−335.2512	−1,026.0384	−1,053.6167
Obs. P	0.0410	0.0556	0.0335	0.0335
Pred. P	0.0217	0.0284	0.0164	0.0177

Notes: The estimates are marginal probability estimators. Robust standard errors are reported in parenthesis. *, ** and *** are 10%, 5% and 1% level of significance.

Now, we examine the behavior of the four traditional AD heavy users against the remaining all other countries (i.e., excluding the 4 countries), and the results are shown in table 4. The retaliatory actions are statistically significant at the level of country, rather than at the level of industry. That is, the retaliatory actions of the developed countries are initiated or imposed when their trading partners have often used AD actions in a previous year and these actions are not industry-to-industry.

As for their retaliatory actions against themselves, the results are summarized in table 5. Unlike the results of table 4, interestingly their retaliatory actions are statistically significant at the level of industry, instead of country-level. More precisely, we found that the developed countries are more sensitive to initiated AD at industry level than measured AD against other traditional AD heavy users. These results may be due to a rational expectation of the developed countries. That is, when a developed country initiated an AD case against other developed country for a certain industry, the latter country may be able to correctly calculate whether the former's AD is a real threat or a simply empty threat at the stage of AD initiation. This is because the four developed countries have a lot of historical experiences of AD imposition on each other, and are able to correctly predict the resulting outcomes of the AD initiations from such experiences. So, the retaliatory action can be determined upon AD initiation stage before the final decision is made.

However, as shown in table 4, when a developing country initiated an AD case for a certain industry against a developed country, the latter may not be aware of whether it is a credible threat or not. This is because they might not have enough experiences or information about AD disputes with developing countries. Hence, the developed country needs to see and wait for the resulting outcomes, without any further action at the stage of AD initiation. Only after they found it as a real AD action, they may decide to retaliate against the developing countries. In this case, as shown in table 4, the retaliation actions are not industry-to-industry and can be imposed or initiated across all industries.

Table 4 Marginal Effects from Probit Estimation between DV4 and ROW24

IMPORTER	DV4	DV4	DV4	DV4
EXPORTER	ROW24	ROW24	ROW24	ROW24
$INITIATION^{k}_{ijt-1}$	0.00240*** [0.00056]			
$INITIATION^{k}_{jit-1}$	0.00232 [0.00274]			
$INITIATION^{k}_{jot-1}$	0.00042** [0.00017]			
$MEASURE^{k}_{ijt-1}$		0.00124 [0.00133]		
$MEASURE^{k}_{jit-1}$		0.00042 [0.00374]		
$MEASURE^{k}_{jot-1}$		0.00034** [0.00015]		
$INITIATION_{ijt-1}$			0.00053*** [0.00009]	
$INITIATION_{jit-1}$			0.00143*** [0.00051]	
$INITIATION_{jat-1}$			0.00004 [0.00005]	
$MEASURE_{ijt-1}$				0.00032*** [0.0001]
$MEASURE_{jit-1}$				0.00185*** [0.00058]
$MEASURE_{jat-1}$				0.00003 [0.00004]
$gdpc_{it-1}$	0.00766* [0.00468]	0.03486*** [0.01142]	0.00129 [0.00286]	0.00710** [0.00292]
bfx_{ijt-1}	–0.03189*** [0.00755]	–0.06609*** [0.01663]	–0.01939*** [0.00503]	–0.02243*** [0.00513]
$SoBT_{it-1}$	–0.03018 [0.0566]	–0.28857** [0.13022]	–0.02456 [0.03218]	–0.04707 [0.03557]
$Imps^{k}_{ijt-1}$	12.01738*** [2.15277]	12.64392*** [3.4152]	7.72817*** [1.23431]	8.85862*** [1.38257]
Year Effects	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Number of Obs	4,567	1,729	7,510	7,510
Pseudo R^2	0.241	0.272	0.236	0.215
Log Pseudo Likelihood	–644.3052	–286.3790	–886.3158	–910.1513
Obs. P	0.0458	0.0602	0.0358	0.0358
Pred. P	0.0209	0.0251	0.0143	0.0156

Notes: The estimates are marginal probability estimators. Robust standard errors are reported in parenthesis. *, ** and *** are 10%, 5% and 1% level of significance.

Table 5 Marginal Effects from Probit Estimation between DV4 and DV4

IMPORTER	DV4	DV4	DV4	DV4
EXPORTER	DV4	DV4	DV4	DV4
$INITIATION^{k}_{ijt-1}$	–0.00731 [0.00726]			
$INITIATION^{k}_{jit-1}$	0.00150*** [0.00054]			
$INITIATION^{k}_{jot-1}$	–0.00028** [0.00014]			
$MEASURE^{k}_{ijt-1}$		–0.00475 [0.00555]		
$MEASURE^{k}_{jit-1}$		0.00488 [0.00451]		
$MEASURE^{k}_{jot-1}$		–0.00056 [0.00048]		
$INITIATION_{ijt-1}$			–0.00312* [0.00192]	
$INITIATION_{jit-1}$			0.00026 [0.00021]	
$INITIATION_{jat-1}$			0.00007 [0.00006]	
$MEASURE_{ijt-1}$				0.00194** [0.0011]
$MEASURE_{jit-1}$				0.00088 [0.00093]
$MEASURE_{jat-1}$				–0.00008 [0.00007]
$gdpc_{it-1}$	0.07917*** [0.02792]	0.21608** [0.09629]	0.04659*** [0.01907]	0.04655** [0.01894]
bfx_{ijt-1}	0.09816*** [0.03533]	0.21499** [0.09594]	0.04082 [0.03218]	0.06283** [0.03024]
$SoBT_{it-1}$	–0.69705*** [0.28885]	–0.98787 [0.89723]	–0.35797** [0.16109]	–0.37563** [0.16512]
$Imps^{k}_{ijt-1}$	–0.84201 [0.77994]	2.57310 [2.48057]	–0.38031 [0.5714]	–0.68582 [0.69639]
Year Effects	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Number of Obs	330	96	509	509
Pseudo R^2	0.193	0.238	0.164	0.154
Log Pseudo Likelihood	–60.8806	–24.4602	–80.9097	–81.8428
Obs. P	0.0606	0.1042	0.0472	0.0472
Pred. P	0.0313	0.0358	0.0223	0.0246

Notes: The estimates are marginal probability estimators. Robust standard errors are reported in parenthesis. *, ** and *** are 10%, 5% and 1% level of significance.

3.3. Rest of the World (24 Developing Countries)

Now, we investigate the AD actions of the rest of the world (24 developing countries), and the regression results are summarized in table 6, 7 and 8.

Unlike the four traditional heavy users whose behaviors were shown in table 3, the developing countries tend to retaliate against countries at industry level as well as at country level. Interestingly, the result summarized in table 6 shows that they are more sensitive to measured AD at the industry level than to initiated AD when they retaliate against all countries. The probability of retaliatory AD is estimated as 0.21% when we used the $MEASURE^{k}_{jit-1}$, while it is 0.11% using the $INITIATION^{k}_{jit-1}$. Our interpretation is that because the developing countries have had less experiences of 'using' AD than developed countries, the retaliatory action may be observed more often only after they confirm the imposition of AD than at the earlier stage of AD initiation. That is, compared to developed countries, they are relatively less accurate in calculating the implication of AD initiations than developed countries.

To see this clearly, we divided the sample to 4 developed countries and 24 developing countries. We first conduct the same analysis for a case where the 24 developing countries retaliate against the 4 traditional AD heavy users. But, our findings summarized in table 7 are very similar to those in table 6. However, as shown in Table 8, the retaliation actions of the developing countries against other developing countries tend to be slow, compared to the case of retaliation against the 4 developed countries. As we mentioned above, this may be because the developing countries seem to lack enough information and experiences of the AD cases, among the developing countries. Hence, their retaliations may be delayed until the final decisions of the AD investigation are made. Table 8 revealed that the estimated probabilities of retaliation against AD initiations and measures are all statistically insignificant.

Table 6 Marginal Effects from Probit Estimation between ROW24 and ALL

IMPORTER	ROW24	ROW24	ROW24	ROW24
EXPORTER	ALL	ALL	ALL	ALL
$INITIATION^{k}_{ijt-1}$	0.00166*** [0.00061]			
$INITIATION^{k}_{jit-1}$	0.00112** [0.00048]			
$INITIATION^{k}_{jot-1}$	–0.00011* [0.00006]			
$MEASURE^{k}_{ijt-1}$		0.00054* [0.00031]		
$MEASURE^{k}_{jit-1}$		0.00213** [0.00096]		
$MEASURE^{k}_{jot-1}$		–0.00033 [0.00022]		
$INITIATION_{ijt-1}$			0.00075*** [0.00008]	
$INITIATION_{jit-1}$			0.00024*** [0.00008]	
$INITIATION_{jat-1}$			–0.00002* [8.E-6]	
$MEASURE_{ijt-1}$				0.00077*** [0.00008]
$MEASURE_{jit-1}$				0.00008 [0.0001]
$MEASURE_{jat-1}$				–0.00001 [0.00001]
$gdpc_{it-1}$	–0.01275*** [0.00327]	–0.02636*** [0.00568]	–0.00914*** [0.00177]	–0.00953*** [0.00183]
bfx_{ijt-1}	–5.E-6*** [2.E-06]	–5.E-6*** [2.E-06]	–4.E-6*** [1.E-06]	–4.E-6*** [1.E-06]
$SoBT_{it-1}$	0.00159 [0.00267]	0.11070*** [0.0361]	0.00161 [0.002]	0.00149 [0.00195]
$Imps^{k}_{ijt-1}$	1.70928*** [0.21317]	1.84289*** [0.29521]	1.29293*** [0.14795]	1.30734*** [0.14369]
Year Effects	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Number of Obs	15,562	5,476	28,091	28,091
Pseudo R^2	0.130	0.171	0.123	0.121
Log Pseudo Likelihood	–1,604.9749	–689.8151	–2,357.7714	–2,363.6422
Obs. P	0.0254	0.0351	0.0194	0.0194
Pred. P	0.0149	0.0171	0.0113	0.0114

Notes: The estimates are marginal probability estimators. Robust standard errors are reported in parenthesis. *, ** and *** are 10%, 5% and 1% level of significance.

Table 7 Marginal Effects from Probit Estimation between ROW24 and DV4

IMPORTER	ROW24	ROW24	ROW24	ROW24
EXPORTER	DV4	DV4	DV4	DV4
$INITIATION^{k}_{ijt-1}$	0.01548*** [0.00438]			
$INITIATION^{k}_{jit-1}$	0.00224* [0.00112]			
$INITIATION^{k}_{jot-1}$	–0.00025* [0.00014]			
$MEASURE^{k}_{ijt-1}$		0.00946 [0.00861]		
$MEASURE^{k}_{jit-1}$		0.00428* [0.0022]		
$MEASURE^{k}_{jot-1}$		–0.00021 [0.00027]		
$INITIATION_{ijt-1}$			0.00449*** [0.00113]	
$INITIATION_{jit-1}$			0.00028** [0.00013]	
$INITIATION_{jat-1}$			0.00003 [0.00002]	
$MEASURE_{ijt-1}$				0.00560*** [0.00148]
$MEASURE_{jit-1}$				0.00012 [0.00019]
$MEASURE_{jat-1}$				0.00005* [0.00003]
$gdpc_{it-1}$	–0.01021 [0.01233]	–0.02259 [0.02433]	–0.00414 [0.00634]	–0.01025 [0.00753]
bfx_{ijt-1}	–4.E-06** [2.E-06]	–6.E-06*** [3.E-06]	–2.E-06* [1.E-06]	–3.E-06** [1.E-06]
$SoBT_{it-1}$	–0.00647 [0.00831]	0.18194 [0.18699]	–0.00684 [0.00874]	–0.00745 [0.00834]
$Imps^{k}_{ijt-1}$	2.22527*** [0.55569]	1.39950 [0.91708]	0.67297** [0.33725]	1.13348*** [0.37982]
Year Effects	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Number of Obs	1,644	565	2,217	2,217
Pseudo R^2	0.209	0.234	0.222	0.182
Log Pseudo Likelihood	–243.6457	–116.5107	–262.9040	–276.2151
Obs. P	0.0462	0.0761	0.0352	0.0352
Pred. P	0.0228	0.0329	0.0135	0.0169

Notes: The estimates are marginal probability estimators. Robust standard errors are reported in parenthesis. *, ** and *** are 10%, 5% and 1% level of significance.

Table 8 Marginal Effects from Probit Estimation between ROW24 and ROW24

IMPORTER	ROW24	ROW24	ROW24	ROW24
EXPORTER	ROW24	ROW24	ROW24	ROW24
$INITIATION^{k}_{ijt-1}$	0.00124** [0.00052]			
$INITIATION^{k}_{jit-1}$	0.00064 [0.0006]			
$INITIATION^{k}_{jot-1}$	0.00019 [0.00012]			
$MEASURE^{k}_{ijt-1}$		0.00030 [0.00031]		
$MEASURE^{k}_{jit-1}$		0.00407* [0.00216]		
$MEASURE^{k}_{jot-1}$		–0.00090 [0.00055]		
$INITIATION_{ijt-1}$			0.00069*** [0.00008]	
$INITIATION_{jit-1}$			0.00006 [0.00018]	
$INITIATION_{jat-1}$			0.00003 [0.00003]	
$MEASURE_{ijt-1}$				0.00074*** [0.00009]
$MEASURE_{jit-1}$				0.00008 [0.00018]
$MEASURE_{jat-1}$				5.E-06 [0.00003]
$gdpc_{it-1}$	–0.01526*** [0.00375]	–0.03051*** [0.00657]	–0.01016*** [0.00196]	–0.01019*** [0.002]
bfx_{ijt-1}	–1.E-05*** [4.E-06]	–1.E-05*** [4.E-06]	–7.E-06*** [2.E-06]	–7.E-06*** [2.E-06]
$SoBT_{it-1}$	0.00236 [0.0028]	0.12821*** [0.03748]	0.00193 [0.00206]	0.00192 [0.00201]
$Imps^{k}_{ijt-1}$	4.58132*** [0.67191]	4.88482*** [1.03811]	3.53026*** [0.39759]	3.57923*** [0.39825]
Year Effects	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes
Number of Obs	12,436	4,217	23,417	23,417
Pseudo R^2	0.130	0.167	0.127	0.128
Log Pseudo Likelihood	–1,294.3543	–537.0059	–1,999.3797	–1,997.8759
Obs. P	0.0257	0.0353	0.0199	0.0199
Pred. P	0.0152	0.0171	0.0114	0.0114

Notes: The estimates are marginal probability estimators. Robust standard errors are reported in parenthesis. *, ** and *** are 10%, 5% and 1% level of significance.

4. CONCLUSION

In this paper, we investigated a pattern of retaliatory action of AD, among the countries. In particular, we focus on the comparison between the developed and developing countries. First, for the four traditional AD heavy users, such as Australia, Canada, EU and US, we investigate their retaliatory actions of AD. We found that the developed countries' retaliatory actions are more sensitive to initiated than measured AD against the other developed exporting countries. This result may be interpreted that the developed countries can accurately calculate the damage of AD at the stage of initiation, and hence, tend to be quick to respond to an AD filing of the exporters. After all, they are 'traditionally known' AD heavy users who have a lot of experiences of AD filing and being filed. Second, we examined 24 developing countries' retaliatory actions in the same manner, and found that their reactions are more sensitive to measured AD than initiated AD of all exporting countries. Our interpretation for this different result is as follows. Unlike the traditional AD users, these relative new AD users still need to learn a consequence of AD initiations, and thus, they tend to delay their retaliatory reaction until the damages of AD are clearly apparent. Hence, their retaliatory actions are made after the implementation of AD, not the stage of initiation of AD. Our results disappear at the aggregated level. The above results showed a fact that there has been a disproportionate reaction of AD at the industry level data, but not at country level data.

One may view that our paper is in line with the literature such as Prusa and Skeath (2002) and Feinberg and Reynolds (2006), in a sense that we look further into the different patterns of retaliatory AD filings between the traditional AD heavy users and new heavy users. In particular, we compare the effect of 'initiated' AD filings and 'imposed' AD duties on the retaliatory action of a country in each group of AD heavy users. As a further study in this direction, we suggest the following idea. First, one may pursue a variety of retaliatory actions of trade policies in addition to AD. For

example, we may compare the use of AD or countervailing duties in terms of their strategic or retaliatory motivation. Second, this paper simply provided an evidence of retaliatory actions of AD filings among different groups of AD users and attempted to explain the fact as a learning behavior in correctly anticipating the cost implications of AD duties. So, one may further consider building up a theoretical model of such institutional learning in setting AD policies to justify our findings. We may leave it for a future research topic.

APPENDIX

A1. List of 28 Countries[9)]

Argentina(ARG), Australia(AUS), Brazil(BRA), Canada(CAN), Chile(CHL), China(CHN), Colombia(COL), Costa Rica(CRI), Ecuador(ECU), The European Union(EUN), Indonesia(IDN), India(IND), Jamaica(JAM), South Korea(KOR), Mexico(MEX), Malaysia(MYS), New Zealand(NZL), Peru(PER), The Philippines(PHL), Paraguay(PRY), Thailand(THA), Trinidad and Tobago(TTO), Turkey(TUR), Taiwan(TWN), Uruguay(URY), The United States(USA), Venezuela(VEN), South Africa(ZAF).

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9) Abbreviations of country names are in parenthesis and used in figure 2. The European Union includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and UK.

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