

Causes of Anti-dumping Actions: Macroeconomics or Retaliation?

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Abstract

Anti-dumping (AD) investigations are widespread. China and the U.S. are two big users and targets of AD investigations. They, respectively, represent developing and developed countries on one hand, and new AD user and traditional AD user on the other hand. In this paper, using AD filing data from these two countries from 1991 to 2005, we examine how AD filings in China and the U.S., respectively, are affected by macroeconomic conditions, retaliatory motives and other factors. This is achieved by using negative binomial models and maximum likelihood techniques. First, we show that the slowdown of GDP growth, appreciation of domestic currency and increase in import penetration significantly increase a country's AD filings. Second, it is also found a country uses AD filings against other countries which use similar measures on this country's exports. Third, we identify and test a number of control variables, including geographical distance, time trend and contagion. Fourth, we compare China and the U.S. and find that they have similar AD filing behavior in response to changes in macroeconomic conditions, but they are not similar in the use of AD filings as a retaliatory tool, and they are very different with regard to the relationship between AD filings and other control factors.

Key Words: antidumping; macroeconomic conditions; retaliatory motives; geographical distance; contagion.

1. Introduction

Anti-dumping (AD) investigations have been growing rapidly in the past two decades¹. According to the WTO (2007) reports, from 1995 to 2006, there were 42 countries/regions that launched a total number of 3044 antidumping investigations against 98 countries/regions.² AD filings/investigations have two main features.³ First, the pattern of AD users has a significant change. Developing countries accounted for only about 20 percent of the total AD filing cases in early 1990s, but since 1995, they have initiated over half of the total number of AD investigations⁴. China, together along with Argentina, Brazil and India, are the heaviest AD users from developing countries. Today, AD is not only a major trade issue between the North and the South, but also a serious problem within the South.

Second, there exists a severe asymmetry for a country as a plaintiff and as a defendant⁵. China remains as the most frequent target of AD investigations. During the period 1995-2006, China was subject to 536 (the largest number) AD investigations while it launched 133 AD investigations. During the same period, the U.S. faced 175 AD investigations and initiated 373 AD filings. India was the heaviest AD user in the world, having 457 AD investigations.

What factors determine a country's use of AD investigations? In this paper, we use data from two countries, China and the U.S., to explore the answers. The choice of these two countries is interesting and important: both countries are significant users of AD investigation; China is relatively a new AD user while the U.S. is a traditional AD user; China is a developing country and U.S. is a developed country.

It is commonly believed that the widespread and rapid increase in the use of AD measures, including AD filings and positive AD decisions, is a result of the WTO. First, AD measures are used by importing countries to substitute tariffs that have been reduced

¹ Figure 1 shows the antidumping proliferation.

² Each initiation reported covers one product imported from one country. "Country" in each case refers to country or customs territory.

³ In a typical AD procedure, the firms from an importing country make the initial AD filings, then the importing country's government undertakes an AD investigation, and finally the government makes its AD decision. Since AD filings and AD investigations normally have one-to-one correspondence, in this paper we use these two terms interchangeably.

⁴ Figure 2 shows change in the pattern of AD users.

⁵ Figure 3 shows a country's asymmetric position as a defendant and as a plaintiff.

continuously during various rounds of GATT/WTO negotiations.⁶ For this reason, AD is regarded as one of the most important protectionist measures nowadays. Second, AD measures are used by countries as a safety-valve because the WTO does not provide sufficient mechanisms to safeguard domestic import competing industries.⁷ Third, AD is abused by many countries because WTO does not have a strong control on use of AD measures.⁸ For whatever reasons, the increased use of AD investigations and AD duties has already had serious impacts on global trade flows.

The literature on AD is vast. Blonigen and Prusa (2003) have provided a useful review of this literature. We here discuss the studies most related to our paper. Specifically, we mainly discuss those empirical works on AD filings, but will also mention some empirical works on AD decisions. The key question asked in those studies is what factors affect a country's AD filings and AD decisions. They can be divided into two categories: macroeconomic factors and retaliatory factors.

The macroeconomic determinants that have been used in various studies include real GDP growth of the importing country, the import penetration ratio (roughly import to GDP ratio) in the importing country, and real exchange rate between the importing and exporting countries' currencies.⁹ Using AD filing data from four countries (Australia, Canada, EU and U.S.) data during the period 1980-1998, Knetter and Prusa (2003) find that slower GDP growth in the importing countries results in more AD filings from those countries.¹⁰ They also find that the importing country's currency appreciation leads to more AD filings and approval.¹¹ Using the Tobit model to analyze the U.S. AD petitions, together with countervailing duty petitions, against Brazil, Japan, Korea and Mexico from 1982 to 1987, Feinberg (1989) finds that both slower GDP growth in the U.S. and the U.S. dollar

⁶ See arguments from Feinberg and Reynolds (2005) and Deardorff and Stern (2005) among others.

⁷ See arguments from Moore and Zanardi (2006) among others.

⁸ See Hansen and Prusa (1995) for the arguments.

⁹ Other related variables have also been tested in the literature including import intensity, unemployment rate and real GDP per capita.

¹⁰ Their finding is consistent with the theory prediction: Slower economic growth in the importing country is associated with lower industry profits and weaker demand for imports, which makes dumping more easily found and AD duties more easily justified.

¹¹ Existing theories do not provide definite relationship between real exchange rate and AD. When the importing country's currency appreciates, export price, in terms of exporting country's currency, will go up (pricing-to-market), which reduces the possibility of dumping. However, export price will go up only partially (partial pass-through) and the import competing firms' market share and profit will be reduced, which makes it easier for the importing country to impose AD duties.

depreciation are accompanied by increased AD cases from the U.S.. However, it is observed that some of the results are sensitive to the models. Using the binomial model, Feinberg (2003) finds that the result with regard to exchange rate is reversed.¹² Sadni-Jallab et al. (2005) add the import penetration ratio (import to GDP ratio) variable to a set of macroeconomic variables to test their impacts on AD filings. Using the data from EU and the U.S., they find that in both regions the effect of import penetration on AD is generally not statistically significant, but an appreciation of the real exchange rate has a positive and significant impact on AD filings. GDP changes have an impact on AD filings only in the U.S.¹³ However, it is found by others (e.g., Blonigen, 2005; Deardorff and Stern, 2005) that an increase in import penetration ratio has positive and statistically significant impacts on AD filings.

Some retaliatory factors have also been considered in the empirical AD literature. Based on AD cases filed by all GATT/WTO members from 1980 to 1998, Prusa and Skeath (2002, 2004) observe that an AD club exists in the sense that most AD cases are against those countries which have used AD before, or most AD users are also AD targets. By running regressions for the traditional AD users and new AD users, respectively, they find that there are significant tit-for-tat retaliation motives for the traditional users' AD, but the motives for the new users are just the opposite. Both traditional and new users have more AD against AD club members than non-club members. Using the U.S. data on both AD filings and AD duty imposition, Blonigen and Bown (2003) find that the existence of AD laws in other countries helps discourage the U.S. to use AD against the other countries, because those countries would be able to use AD to retaliate the U.S. action. They also find that the WTO dispute settlement mechanism helps reduce the number of positive decisions on AD in the U.S.. Niels and Francois (2006) find that among the AD filings in Mexico, the probability of getting AD duty imposed is three times higher for the filings towards those countries which have used AD against Mexico before than for the other filings. This clearly indicates the retaliation motives in the Mexican government's AD decisions. Feinberg and Reynolds (2006) use industry level (20 HS categories) data to study AD retaliation by 40 importing countries against 72 exporting countries. Their study finds the existence of retaliation motives not only

¹² This study is based on the U.S. AD filings from 1982 to 1998.

¹³ It is expected that a larger import penetration ratio implies fiercer competition and so will result in more AD filings and AD duty impositions.

at the country level, but also at the industry level.

Our paper makes a contribution to the literature in three important ways. First, we include a more comprehensive set of explanatory variables to test AD filings. Note that the most comprehensive set of variables in the literature is used by Feinberg and Reynolds (2006). Their retaliation variables include club, deter and trade deflection effects and their macroeconomic variable include import and exchange rates. In addition to those in Feinberg and Reynolds (2006), our study also include growth rate of real GDP as a macroeconomic variable and a number of other variables to capture indirect retaliation. Moreover, we use *ADL* to capture club effect on a more general basis.¹⁴ We find that both countries' AD filings change in response to changes in their GDP growth rates, real exchange rates and import penetration ratios. Various retaliatory motives are also found in both countries' AD filings.

Second, we introduce other variables in our regression model such as geographical distance and contagious effect. We find that a country's AD filings can be positively or negatively correlated with the geographical distance between the country and its trading partners. When a country is punished by another country's AD duties, it is also more likely to face AD investigation by the U.S. and China.

Third, we study AD filings in China and the U.S. and compare them. Most studies focus on AD filings and decisions from developed countries, but it is observed that developing countries have used more AD investigations in recent years. Studies on AD filings from developing countries are very few and recent. Moreover, they study AD in individual developing countries separately.¹⁵ In contrast, our study allows us to see whether AD filings are statistically different between developed and developing countries, and between traditional users and new users. We find that the macroeconomic effects on AD filings in both the U.S. and China are quite similar, but the retaliatory effects are very different and in some cases they are just the opposite.

The rest of the paper is organized as follows. In section 2, we present our regression model, discuss all the variables and describe the data. In section 3, we discuss our findings. We make some concluding remarks in section 4.

¹⁴ Feinberg and Reynolds (2006) uses country dummy to identify club effects for four traditional AD users.

¹⁵ Debapriya et al (2006) focus on India and China, Baruah (2007) on India, Francois and Niels(2004), Niels and Francois (2006) on Mexico and Mah (2006) on Korea.

2. Model Specification, Methodology and Data

We propose the following basic regression model:

$$AD_{ijt} = a_0 + \alpha'e + \beta'r + \gamma'x + \varepsilon$$

where the dependent variable AD_{ijt} is the total number of AD filings made by country i against country j 's exports (to country i) in year t , e a vector of macroeconomic variables, r a vector of retaliation variables and x a vector of other variables. The regression coefficients include α_0 (scale, constant) and vectors α , β and γ . The last term, ε , is the error term.

The dependent variable in our model is the number of AD filings, which is a typical non-negative count variable. Following the standard practice¹⁶, we use Negative binomial models through maximum likelihood techniques.

2.1. The explanatory variables

We have classified the explanatory variables into three groups, economic, non-economic and strategic variables. Some of them have been considered by existing studies while others are new to the literature. We discuss all of them below.

Macroeconomic variables

$GRGDP_{it}$: (Importing) country i 's real GDP growth rate in year t . When a country's economy slows down, domestic firms are more likely to turn to protectionist measures in order to fight for market shares and sales. In addition, as the domestic firms' profitability goes down, it becomes easier for the importing country to prove an injury when the domestic firms file for AD protection. In the case of global economic slowdown (i.e., the exporting country's economy also slows down), foreign firms have incentives to cut prices in order to maintain export volumes, which increases AD incidents from country i . All the above discussions tend

¹⁶ As to count data, which takes on nonnegative values, Poisson and negative binomial regression models are well suited for modeling those variables. The main difference is that Poisson distribution imposes a restriction that the variance of the dependent variable is equal to the mean of the dependent variable, whereas the negative binomial distribution allows the variance to differ from the mean. Examples of such papers using Poisson and/or negative binomial distributions to model the frequency of AD activity include Knetter and Prusa (2003), Sadni-Jallab(2005), Blonigen (2005), Aggarwal (2004), Feinberg (2005) etc. Note that some literature found that the two models yield similar results (Knetter and Prusa, 2003), while some reported that the negative binomial specification allow a better fit of the data to the empirical model than Poisson (Blonigen 2005).

to suggest that a decrease in importing country's real GDP growth may cause an increase in its AD filings.

REX_{ijt} : The change of real average rate between country i's currency and country j's currency in year t, measuring country i's currency appreciation (real). The appreciation of domestic currency weakens the domestic firms' competitiveness against imports. Similar to the GDP slowdown situation, the domestic firms are more likely to seek for protection and it is easier to prove injury. However, domestic currency appreciation makes it more difficult to show imports below fair value because the production costs are incurred with the weaker foreign currency. Therefore, the net effect of currency fluctuation on AD filings is ambiguous, in theory.

$RIMP_{ijt}$: The ratio of country i's imports from country j in country i's GDP in year t. This is also call import penetration ratio. Holding GDP constant, the higher is the penetration ratio, the more intensified competition comes from country j. Holding country i's total import constant, the penetration ratio also reflects the relative degree of competition from country j. Increased competition from country j induces the domestic firms to seek for protection against imports from country j. Hence, we expect that the penetration ratio would result in more AD filings against the corresponding countries.

Retaliatory variables

(1) Actural patterns of retaliation

$TFT_{ij(t-1)}$: A dummy variable, equal to one if country j has AD filing against country i in year (t-1) and zero otherwise. This variable is used to capture the "tit-for-tat" retaliation effect found by Prusa and Skeath (2004).¹⁷

$ADL_{j(t-1)}$: The total number of AD filings made by country j (against all countries) in year (t-1). A large value of this variable indicates that country j is a heavy user of AD filings. It has two conflicting effects on country i's AD filings. First, facing a heavier user country, country i may use fewer AD filings for fear of retaliation (Feinberg and Reynolds 2006).

¹⁷ As Prusa and Skeath (2004) points out that "True tit-for-tat strategies punish the original defector for only so long as she continues to defect. Instances of cooperation by the original defector are rewarded by cooperative play on the part of a true tit-for-tat player. Our tit-for-tat player reverts to the Nash equilibrium, and therefore defects, for all remaining periods following a defection."

Second, a large value of the variable means that country j is a member in the “antidumping club” and so country i is more likely to use AD filings against country j, as suggested by the “antidumping club” effect found by Prusa and Skeath (2004).

$ADF_{i(t-1)}$: The total number of AD filings initiated by all other countries against country i. This variable captures a general level of retaliation, as opposed to the target specific retaliation variable $TFT_{ij(t-1)}$. It means that country i would initiate more AD filings if in the previous year it was a heavy target by other countries.

(2) Potential threat of retaliation

$DETER_{ij(t-1)} = ADL_{j(t-1)} * DEP_{ij(t-1)}$: Deter is the interaction between ADL and DEP .

Where DEP_{ij} is the share of country i’s exports to country j in terms of country i’s total exports in year t. At the country level, if country i’s export share to country j is very large, country i is more concerned about those exports. Anticipating that it might get retaliation from country j (next year) if it imposes AD duties on imports from country j this year, it is more reluctant to use AD against imports from country j. The interaction term captures the effects of both dependence and “antidumping club” member. That is, a country is less likely to initiate AD filings against another country, if the latter’s market is an important export market for the former and the latter is a heavy user of AD policy. For this reason, we would expect this variable to have a negative estimated coefficient.

Other variables

(1) Contagion effects:

ADT_{-ji} : The total number of AD filings against country j’s exports by all countries other than country i in year t. This can be considered as the “echoing” effect.¹⁸ Suppose EU initiates (a third country) an AD filing against China (country j). Then, firms in the U.S. (country i) become aware of Chinese dumping or they believe the chance to get affirmative decisions from their government is increased. Therefore, the America firms also file an AD complaint against China. This behavior may be strategic, but it may also be because of

¹⁸ Messerlin (2004) observes that between 1980 and 1999, 75 percent of AD cases initiated against Chinese exports by the US and 68 percent by the EU were echoing cases in the sense that they echoed each other within a year or less.

information transmission, from EU to the U.S. in the above example. It is important to note that even if Chinese dumping occurs in EU market, it may not occur in the U.S. market. Nevertheless, the “third country” effect captures the possible AD chain effect and the corresponding coefficient is expected to be positive.

$ADT_{-j(t-1)}$: The total number of AD filings against country j’s exports by all countries other than country i in year (t-1). This can be considered as the “deflection” effect. Cases filed against one country (country j) may divert its trade flows elsewhere leading to more import protection being sought by third countries (country i), including antidumping filings. Bown and Crowley (2006) has proved this trade deflection effect by examine the effects of US AD actions against Japan on Japanese exports to the US and Europe. They find that trade to the US is reduced, Japanese exports are deflected to Europe resulting in increased quantities and reduced prices of Japanese goods in the European market, which might lead to EU’s AD filings against Japan. So the coefficient is expected to be positive.

All of these suggest that AD spreads is via relatively straightforward contagion effects. We try to distinguishing these from the asserted retaliation effect. We use current value of ADT to test echoing effect and one year lagged ADT to test trade deflection effect.

(2)Distance effect

$DIST_{ij}$: The distance between country i and country j, measured by the distance between the two respective capital cities. It has been widely observed and explained in the trade literature that distance has negative effects on trade flows. However, it is not clear how this geographic variable affects trade policies in general and AD filings in particular. On the one hand, distance reduces trade flows and as a result may reduce AD filings. In addition, for two countries which are far apart, the firms in the importing country may have less information about the exporting firms and so AD complaints may be less likely to be filed. On the other hand, longer the distance is associated with larger transaction costs (e.g., transport costs and insurance costs). This may allow import competing firms to manipulate the cost calculation more easily. In that case, longer distance would lead to more AD filings. To summarize, the impact of distance on AD filings is not clear.

(3)Time effect

Time : This variable is identified to capture the eventual trend effects. Does AD filings initiated by China or the US change annually, if so in which direction? Time is defined as the date of the filing, expressed in number of years since the beginning of the sample period. So the Time value for China associated with the first year of 1997 is equal to 1, the second year has a Time value equal to 2, and so on up to 9 for the last year of 2005. We do the same for the US case.

2.2. Data sources and discussion¹⁹

First, the dependent variable, AD_{ijt} . We run regression, using U.S. and China, respectively, as the importing countries. In the U.S. regression, the panel data cover time series (annual) from 1991 to 2004 and AD filings against 39 countries/regions. In the China regression, the panel data start from 1997 and ends in 2005 with 23 target countries/regions.²⁰ The WTO website (www.wto.org) provides information about the number of each country's AD filings against *all* other countries in every year. What we need is the number of AD filings by China and U.S., respectively, against *each* foreign country (i.e., the number and identity of the named country). Such country-level information for the U.S. AD filings can be found from Global Antidumping Database version 2.1 created by Chad Bown (http://people.brandeis.edu/~cbown/global_ad/). The country-level information for China's AD filings is available from China Trade Remedy Information website (<http://www.cacs.gov.cn/>). These two datasets also include industry-level AD filings and information about the ultimate determination on AD duty imposition, which are not used in our empirical analysis.

Real GDP data (GDP_{it}) and its annual growth rates ($GRGDP_{it}$) are gathered by the USDA Economic Research Service (<http://www.ers.usda.gov/>). In our empirical work we perform tests using the number of filings against individual countries, so we used bilateral real exchange rates between each of the filing countries and each of its named countries. The Economic research Service of the US Department of Agriculture was a convenient source for

¹⁹ See table 1 for the details.

²⁰ We should also include the zero-filing countries. Do this in the future

bilateral real exchange rate indices (<http://www.ers.usda.gov/Data/exchangerates/>).

Calculation of the import penetration ratios, $RIMP_{ijt}$, and export shares, DEP_{ijt} , requires data on bilateral trade, both imports from and the exports to the named countries. China's bilateral trade data can be found from various issues of China's Statistic Yearbooks. The U.S. bilateral trade data are available from the USITC website (<http://dataweb.usitc.gov/>). Country distance, $DIST_{ij}$, can be calculated from the following website: <http://www.mapcrow.info/>.

3. Estimation Results

The regression results for the U.S. and China are presented in Table 2.1 and Table 3.1, respectively. In both tables, column (1) lists the estimates based on the regression which include the three macroeconomic variables (with one year lag except for REX) and the time trend, t , for the importing country's AD filings. Column (2) extends the regression of (1) by adding the control variable, geographical distance. Based on regression (2), the three retaliation variables, TFT , ADL and ADF , are introduced in column (3), (4) and (5), respectively. In column (6), the potential threat of retaliation variable, $DETER$ is introduced. And column (7) adds the contagious effect variable, ADT .

We also run other regressions to see other effects and their results are reported in Table 2.2 for the U.S. and Table 3.2 for China. In these two tables, Columns (1), (2) and (3), respectively, combine each of the three retaliation variables with deter, in order to distinguish the effect of real retaliation and the effect of potential retaliation. We then include ADT to each of those columns to get Columns (4), (5) and (6), respectively. By doing this, we are able to see effect of retaliation motives and the effect of chain factors. The last three columns, (7)-(9), give tests to the combined effects of all retaliatory variables and contagious effect variable.

3.1. The Regression Results on the U.S. AD Filings

All macroeconomic variables have significant effects on the U.S. AD filings. There is a

negative impact of previous year's GDP growth on current year's AD filings. A 1 per cent reduction in the U.S. real GDP growth rate results in a 10.3 to 13.2 per cent increase in the U.S. AD filings. The impact of import penetration on AD filing is negative, a 1 per cent increase in import penetration ratio leads to a 72.3 to 107.1 per cent increase in AD filings. The U.S. dollar appreciation also results in more AD filings from the U.S. in the same year. However, there is no significant impact on current year's AD filings from previous year's dollar appreciation. The implication is that the response of AD filings to exchange rate changes is very quick.

The parameter of the time trend is negative and significant in all regressions, indicating a decreasing trend of AD filings in the U.S., at the rate of 4.7 to 6.9 per cent per annum.

Adding geographical distance variable to the macroeconomic model, it is found that the distance between an exporting country and the U.S. has positive effects on the U.S. AD filings against the corresponding country. A 10 per cent increase in the distance is accompanied by an increase in 3.75 to 5.08 per cent increase in AD filings. The distance variable can also be viewed as a control variable in the macroeconomic model. Comparing Column (1) and (2) in Table 2.1, we can see that adding this control variable does not change the results of other macroeconomic variables.

There are significant direct tit-for-tat retaliatory effects. Other things equal, the U.S. will launch 43.2 to 51.8 per cent more AD filings against those countries which have had AD against the U.S. before than those that have never has AD against the U.S. However, an increase in one more AD filing by a country, the U.S. will have 1.4 to 1.8 per cent more AD filings against that country in the following year. This indicates "club effect" in the US. Moreover, it seems that the U.S. tries to avoid punishing other countries that use AD against it in the previous year. An increase in one AD investigation against the U.S. by other countries in the previous year, the U.S. AD filing will decrease by 1.9 to 2.1 per cent. *DETER* does not have significant effect on the U.S. AD filing. It might indicate that the U.S. is not afraid of other countries' AD retaliation.

The echoing effect and deflection effect both shows up in the U.S. AD filings. When a country receives one more AD investigation from other countries, the U.S. will launch 3.1 to 3.5 per cent more AD filings against that country within the same year. If we use the one year

lag ADT variable, the increase in the U.S. AD filing is 2.2 to 3.1 per cent.

3.2. The Regression Results on China's AD Filings

Macroeconomic variables have various impacts on the AD filings in China. A 1 per cent increase in real GDP growth in China will reduce the following year's AD filings by 5.1 to 8.3 per cent. A 1 per cent rise in import penetration ratio will result in 35.1 to 59.1 per cent increase in China's AD filing in the following year. However, changes in exchange rates do not have a significant effect on AD filing in both the current and the following year.²¹

Adding the two control variables, time trend and geographical distance, does not alter the sign and significance of the macroeconomic variables' impacts on AD filings. However, those two control variables have the opposite effects compared to those in the U.S. After controlling for the macroeconomic factors, China's AD filing increases at the rate of 20 to 27.7 per cent per annum. A 10 per cent reduction in geographical distance between China and the importing country results in 2.73 to 5.53 per cent increase in China's AD filing against the corresponding countries.

We now discuss the retaliatory variables. China does not seem to have the tit-for-tat retaliation towards its trading partners. However, other retaliatory effects are significant. An increase in one more AD filing in a country will lead to a 1.2 to 1.6 per cent increase in China's AD filing against that country in the following year. An increase in one more AD filing by a country against China's export will raise 5.6 to 7.2 per cent more AD filing in China in the following year (not necessarily against that country). *DETER* has positive and significant effect on China's AD filing, indicating that China is more likely to target its major exporting countries who use AD against China.

The echoing effect also shows up in China's AD filings, however there is no evidence for the deflection effect in China. When a country receives one more AD investigation from other countries, China will launch 4.8 to 7.2 per cent more AD filings against that country within the same year. If we use the one year lag *ADT* variable, the effect is not significant.

²¹ Although the Chinese currency was basically fixed to the U.S. dollar during the period 1994-2005, it fluctuated against other major currencies.

3.3. Comparisons

In order to compare whether the AD filing practice in the U.S. and that in China are similar, we pool the US and China data together and run the following regression

$$Y = Cons + A'X + \lambda DUMMY + B'X * DUMMY$$

The explanatory variables above include original variables in our main regression model given at the beginning of section 2, the dummy variable, and the product of the dummy variable with the explanatory variables, where *DUMMY* is equal to 1 for the U.S. and 0 for China.

The results are reported in Tables 4-1 and 4-2.²² Moreover, based on the results from Tables 2-4, we compare the two countries' AD filing differences and similarities in Table 5, with a comparison with those obtained from the literature which is based on different countries and different periods from our study. There are three general observations. First, our study confirms some of the results reported elsewhere in the literature while differences remain in some aspects. Second, our study adds some new effects to AD filings. Third, our study shows that in China and the U.S. some of the explanatory variables have similar effects on AD filings, yet some others have the opposite impacts.

Macroeconomics. The effects of GDP growth on AD filings in both countries are similar. Although the estimated parameters are not the same, they are not statistically different (*grgdplus* is not statistically significant). The effects of import penetration ratio on AD filings in both countries are similar, both positive and significant. Those effects are statistically different (*rimplus* is statistically significant), the U.S. having stronger response than China.

While domestic currency appreciation has the expected and significant effect on AD filings in the U.S., the effect is not significant in China's AD filings. However, the effects for both countries are not statistically different (*lnrexus* is statistically insignificant) The

²² The coefficient for the constant in the model is the intercept for China (omitted group), this corresponds to the intercept for China in the separate groups analysis. The coefficient for the *USDummy* corresponds to differences of the intercepts from the separate groups analysis. The coefficient for *X* corresponds to the slope for China (omitted group), i. e. B_{China} . The coefficient for the *X*USDummy* corresponds to the differences of the slopes from the separate groups (i.e. $B_{US} - B_{China}$). The term *X*USDummy* tests the null hypothesis $H_0: B_{US} = B_{China}$. The significant T value indicates that the regression coefficient for US is significantly different from the coefficient for China.

difference may be due to the fact that the U.S. dollar is an anchor currency in international trade while the Chinese currency remains quite stable over the period of time in our study.

Blonigen (2006) points out that the American firms have learned from past AD experience and therefore are able to respond properly to changes in macroeconomic environments. Surprisingly, even though China is a new AD user, its firms AD filing activities are not very different from those of in the U.S. The result may imply that the Chinese firms learn quickly.

Retaliations. The two countries' AD filings are quite different with regard to their retaliatory motives.

The club effects (*ADL*) are observed in both countries. There is clearly tit-for-tat retaliatory motive in the U.S. AD filing. But firms in China do not seem to use tit-for-tat strategy against other countries.

ADF has the opposite and significant effects in the two countries. After receiving more AD investigation, China will file more next year, but the U.S. will file less next year.

Finally, *DETER* has no significant effect for the U.S. but its effect is positive and significant for China²³.

Others. Each of the two control variables has the opposite effects in China's and U.S. AD filings. The differences are also statistically significant. On the one hand, the U.S. has fewer AD filings towards geographically closer countries. On the other hand, China has more AD filings towards geographically further away countries. China uses more and more AD filings over time while the U.S. uses less and less, other things being equal.

Concerning the contagious effects, i.e., when a country is targeted by another country's AD, whether China and the U.S. will increase their AD filings towards the former country. There are two different possible reasons for such an increase. The first one is about trade deflection. When an exporting country becomes a target of another country, its exports to the latter will be reduced, which induces it to redirect its exports to other importing countries, including China and the U.S. This will increase the incidence of dumping to the Chinese

²³ Besides, if the product of *DEP* and *ADL* can be used as a proxy of the ability to fight back those who initiate AD against them, it suggests the potential threat of retaliation from its trade partners would not be a credible threat to the US (insignificant in "deter", so its effects are thus considered as null) and also to China. (positive in "deter")

market and the U.S. market.²⁴ The second reason of contagion is about AD echoing. This is mainly for information spillover reason. When China or the U.S. have seen an exporting country's products be imposed AD duties by another country, they have good reasons to believe that the same country's exports to their markets are also dumping. In this paper, we provide two tests on the contagious effects. We first examine the effect of China and U.S. AD filing changes in response to the AD filings of the target country when it is targeted by a third country, within the same year. This is more consistent with the echoing reason because it takes time for AD duties to be imposed and for trade to be diverted. We find that both countries have positive and significant echoing effect. Moreover, they are not statistically different (*adibus* is not statistically significant). Our second test uses the third country's AD filings with one year lag (previous year). This effect is more consistent with the trade deflection reason. This effect for the U.S. is positive and significant. However, it is not significant for China.

4. Concluding Remarks

During the period 1995-2006, China and the U.S. were two of the countries which launched most AD investigations on one hand, and on the other hand, were subject to most AD investigations. In particular, the U.S. launched 373 AD investigations, being the second most frequent AD user in the world and the most frequent AD user among developed countries. China was investigated 536 times by other countries, being the largest AD target in the world. It is important to explore and compare the determinants of AD filing decisions based on the AD filing data from these two countries. Our empirical study finds that a country's AD filings are affected by macroeconomic conditions, retaliatory motives and other factors.

First, changes in each of the three macroeconomic conditions, namely domestic real GDP growth rates, real exchange rates and import penetration ratios, significantly affect a country's AD filings. Second, a set of retaliatory factors motivate a country's AD filings. Those retaliatory motives include the level of AD filings used by a country's trading partners,

²⁴ Bown and Crowley (2006) examine this trade deflection effect on Japanese exports to EU when Japan faces AD duties imposed by the U.S.

whether a country's trading partner has launched AD investigation against this country, and whether the trading partner is a heavy AD user. Third, this paper has also identified and tested some other important factors that affect AD filings: geographical distance, time trend and AD contagion.

An interesting contribution of this paper is the comparison between China and the U.S. in their use of AD filings. China is a developing country and a relatively new (but also a large) AD user. In contrast, the U.S. is a developed country and a traditional AD user. Our comparison reveals that these two countries have similar AD filing behavior in response to changes in macroeconomic conditions, but they are not similar in the use of AD filings as a retaliatory tool, and they are very different with regard to the relationship between AD filings and other factors (i.e., distance, time trend and contagion).

Our work represents a one step forward to exploring full explanations for AD in the world. Our research can be extended to further analyze the underlying difference between developing and developed countries in AD filings and explore other factors that may affect AD filings, such as culture difference, language difference and income gap. These analyses are more demanding on data (multi-country dataset, industry level or even firm level data, etc) and left for our future research.

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Table 1 Variables and data source

variable	Description	Expected sign	Original data sources
Dependent Variable			
AD _{ijt}	total number of AD filings made by country i against country j's exports in year t		Based on Global AD Database V2.1 compiled by Chad.Bown & China AD Database which is available at http://www.cacs.gov.cn/ .
Explanatory Variables			
GRGDP _{it}	country i's real GDP growth rate in year t (%)	—	Based on data drew from USDA Economic Research Service http://www.ers.usda.gov/ and China's yearly statistic book
REX _{ijt}	Bilateral real exchange rate index in year t	+—	Based on data from USDA Economic Research Service available at http://www.ers.usda.gov/Data/exchangerates/
RIMP _{ijt}	the ratio of country i's imports from country j to country i's domestic demand in year t (%)	+	American bilateral trade data is available at USITC website; American GDP data is available at UN website; Chinese bilateral trade data and GDP data are calculated based on China statistic yearly book 1995-2006.
TFT _{jt}	a dummy variable measuring whether or not country i has ever had any AD filing against country j in the past year	+	Based on Global AD Database V2.1 & WTO annual Report of Committee on Anti-Dumping Practices 1995-2006
ADlag _{jt-1}	the previous year's total number of AD filings made by country j	+	The document "Anti-dumping initiations by reporting Member" provides the annual antidumping filing data 1995-2006 which is available at www.wto.org ; The data prior to 1995 comes from Zanardi (2006)
ADF _{it-1}	the previous year's total number of AD filings initiated against country i	+	During the period 1995-2006, the number of AD filings that a exporting country suffered as a target comes from the document
ADT _{kjt} or ADT _{kj(t-1)}	the AD filings of a third country k against country j's exports in year t or year (t-1)	+	"Anti-dumping initiations by exporting Country", which is available at www.wto.org , The data prior to 1995 comes from Zanardi (2006); Bilateral antidumping data comes from Global AD Database V2.1 & China Antidumping Database.
Deter _{ijt}	Deter=Adlag*Dep, % Where Dep is the export share of country i to country j in year t	—	American bilateral export and total export value is available at USITC website; China's data is calculated based on China yearly statistic book 1995-2006
Dist _{ij}	Distance between the two countries (kilometers)	+—	The distance information can be drawn from Travel Distance Calculator, which is available at http://www.mapcrow.info/
Time	Dummy variable	+—	

Table 2-1 Empirical result for US

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ad	ad	ad	ad	ad	ad	ad
t	-0.047 (3.64) ^a	-0.048 (3.75) ^a	-0.063 (4.61) ^a	-0.055 (4.18) ^a	-0.056 (4.21) ^a	-0.048 (3.73) ^a	-0.056 (4.33) ^a
grgdp1	-0.122 (4.00) ^a	-0.120 (3.93) ^a	-0.128 (4.23) ^a	-0.120 (3.97) ^a	-0.105 (3.35) ^a	-0.120 (3.93) ^a	-0.126 (4.13) ^a
rimp1	0.957 (4.16) ^a	1.080 (4.68) ^a	1.031 (4.82) ^a	1.007 (4.53) ^a	1.067 (4.60) ^a	1.038 (4.40) ^a	0.776 (3.51) ^a
lnrex	0.463 (1.88) ^c	0.509 (2.05) ^b	0.504 (2.06) ^b	0.493 (2.00) ^b	0.461 (1.88) ^c	0.507 (2.04) ^b	0.416 (1.73) ^c
Indist		0.390 (1.76) ^c	0.479 (2.46) ^b	0.391 (1.85) ^c	0.375 (1.69) ^c	0.436 (1.87) ^c	0.105 (0.53)
TFT			0.518 (3.18) ^a				
ADL				0.016 (3.71) ^a			
adf					-0.019 (2.09) ^b		
deter						0.001 (0.75)	
ADT							0.035 (3.53) ^a
Constant	0.140 (0.12)	-3.609 (1.49)	-4.576 (2.07) ^b	-3.528 (1.50)	-2.893 (1.19)	-4.007 (1.60)	-0.770 (0.35)
Observ-	546	546	546	546	546	546	546
No. of group	39	39	39	39	39	39	39
loglikelihood	-674.33	-672.95	-668.11	-666.77	-670.66	-672.68	-667.11
/ln_r	2.838	2.944	3.211	3.106	2.952	2.955	3.339
/ln_s	0.923	1.045	1.337	1.121	1.038	1.045	1.505
chibar ²	116.71	92.70	57.48	84.28	93.44	92.70	21.57
Significant level	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Absolute valued of z statistics in parentheses; ^c significant at 10%, ^b significant at 5%, ^a significant at 1%.

Table 2-2 Empirical result for US (cont'd)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ad	ad	ad	ad	ad	ad	ad	ad	ad
t	-0.063 (4.58) ^a	-0.056 (4.27) ^a	-0.057 (4.23) ^a	-0.069 (5.01) ^a	-0.062 (4.69) ^a	-0.064 (4.76) ^a	-0.069 (4.99) ^a	-0.064 (4.79) ^a	-0.065 (4.78) ^a
grgdp1	-0.128 (4.23) ^a	-0.120 (3.97) ^a	-0.103 (3.30) ^a	-0.132 (4.35) ^a	-0.123 (4.08) ^a	-0.111 (3.57) ^a	-0.132 (4.34) ^a	-0.123 (4.06) ^a	-0.110 (3.53) ^a
rimp1	1.004 (4.55) ^a	1.071 (4.65) ^a	1.000 (4.21) ^a	0.807 (3.99) ^a	0.757 (3.54) ^a	0.769 (3.46) ^a	0.796 (3.80) ^a	0.827 (3.75) ^a	0.723 (3.18) ^a
Lnrex	0.504 (2.05) ^b	0.494 (2.00) ^b	0.455 (1.85) ^c	0.437 (1.84) ^c	0.425 (1.77) ^c	0.381 (1.60)	0.438 (1.84) ^c	0.420 (1.75) ^c	0.382 (1.61)
Lndist	0.508 (2.47) ^b	0.310 (1.41)	0.442 (1.89) ^c	0.233 (1.31)	0.144 (0.76)	0.097 (0.49)	0.246 (1.30)	0.056 (0.28)	0.153 (0.73)
TFT	0.511 (3.12) ^a			0.435 (2.85) ^a			0.432 (2.81) ^a		
ADL		0.018 (3.80) ^a			0.014 (3.34) ^a			0.017 (3.55) ^a	
adf			-0.021 (2.23) ^b			-0.019 (2.06) ^b			-0.020 (2.17) ^b
deter	0.000 (0.49)	-0.001 (1.10)	0.001 (1.11)				0.000 (0.21)	-0.001 (1.21)	0.001 (0.87)
ADT				0.032 (3.22) ^a	0.031 (3.13) ^a	0.034 (3.50) ^a	0.032 (3.18) ^a	0.032 (3.18) ^a	0.034 (3.43) ^a
Constant	-4.828 (2.11) ^b	-2.805 (1.17)	-3.426 (1.37)	-2.172 (1.05)	-1.095 (0.51)	-0.161 (0.07)	-2.287 (1.07)	-0.301 (0.14)	-0.623 (0.27)
Observations	546	546	546	546	546	546	546	546	546
No. of group	39	39	39	39	39	39	39	39	39
loglikelihood	-667.99	-666.14	-670.07	-663.31	-662.15	-664.89	-663.29	-661.38	-664.53
/ln_r	3.212	3.120	2.967	3.698	3.538	3.351	3.693	3.568	3.364
/ln_s	1.328	1.138	1.035	1.898	1.589	1.487	1.886	1.636	1.477
chibar ²	57.47	81.83	93.63	8.06	17.50	22.11	7.81	14.76	22.56
Significant level	0.000	0.000	0.000	0.002	0.000	0.000	.0003	0.000	0.000

Absolute valued of z statistics in parentheses; ^c significant at 10%, ^b significant at 5%, ^a significant at 1%.

Table 3-1 Empirical result for China

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ad	ad	ad	ad	ad	ad	ad
t	0.200 (3.65) ^a	0.211 (3.80) ^a	0.213 (3.88) ^a	0.222 (4.17) ^a	0.038 (0.51)	0.232 (4.66) ^a	0.273 (4.80) ^a
grgdp1	-0.082 (2.51) ^b	-0.083 (2.57) ^b	-0.082 (2.53) ^b	-0.068 (2.11) ^b	-0.076 (2.68) ^a	-0.064 (1.99) ^b	-0.073 (2.15) ^b
rimp1	0.591 (4.62) ^a	0.491 (3.50) ^a	0.470 (3.38) ^a	0.452 (3.64) ^a	0.561 (4.15) ^a	0.363 (4.25) ^a	0.523 (4.43) ^a
lnrex	0.622 (0.98)	0.546 (0.87)	0.579 (0.96)	0.394 (0.70)	0.320 (0.53)	0.207 (0.45)	0.376 (0.67)
Indist		-0.294 (1.65) ^c	-0.304 (1.73) ^c	-0.398 (2.38) ^b	-0.273 (1.65) ^c	-0.550 (5.17) ^a	-0.071 (0.39)
TFT			0.307 (0.91)				
ADL				0.016 (2.35) ^b			
adf					0.067 (3.12) ^a		
deter						0.002 (3.56) ^a	
ADT							0.063 (3.03) ^a
Constant	-1.660 (0.52)	2.433 (0.38)	1.743 (0.35)	2.679 (0.68)	12.755 (0.01)	4.669 (1.30)	1.817 (0.06)
Observations	207	207	207	207	207	207	207
No. of group	23	23	23	23	23	23	23
loglikelihood	-170.86	-169.50	-169.09	-167.18	-164.51	-164.75	-165.34
/ln_r	3.898	5.158	4.845	4.766	16.929	8.122	7.207
/ln_s	1.227	1.287	1.391	1.838	1.363	5.350	1.814
chibar ²	14.75	10.08	8.49	4.44	12.91	2.3e-03	7.15
Significant level	0.000	0.001	0.002	0.018	0.000	0.481	0.004

Absolute valued of z statistics in parentheses; ^c significant at 10%, ^b significant at 5%, ^a significant at 1%.

Table3-2 Empirical result for China (cont'd)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ad	ad	ad	ad	ad	ad	ad	ad	ad
t	0.234 (4.71) ^a	0.231 (4.67) ^a	0.092 (1.29)	0.273 (4.82) ^a	0.274 (4.87) ^a	0.093 (1.25)	0.275 (5.08) ^a	0.277 (5.08) ^a	0.119 (1.62)
grgdp1	-0.063 (1.97) ^b	-0.065 (2.01) ^b	-0.062 (2.15) ^b	-0.072 (2.14) ^b	-0.063 (1.86) ^c	-0.060 (2.05) ^b	-0.059 (1.76) ^c	-0.060 (1.82) ^c	-0.051 (1.72) ^c
rimp1	0.351 (4.31) ^a	0.360 (4.35) ^a	0.401 (4.30) ^a	0.509 (4.33) ^a	0.486 (4.18) ^a	0.564 (4.90) ^a	0.395 (4.12) ^a	0.394 (3.78) ^a	0.457 (4.23) ^a
lnrex	0.317 (0.67)	0.199 (0.44)	0.047 (0.10)	0.407 (0.73)	0.359 (0.65)	0.162 (0.28)	0.313 (0.61)	0.241 (0.48)	0.098 (0.18)
Indist	-0.539 (5.41) ^a	-0.553 (5.51) ^a	-0.518 (4.09) ^a	-0.076 (0.43)	-0.175 (0.94)	-0.046 (0.29)	-0.328 (2.14) ^b	-0.331 (2.03) ^b	-0.243 (1.44)
TFT	0.202 (0.80)			0.200 (0.63)			0.181 (0.58)		
ADL		-0.002 (0.17)			0.012 (1.72) ^c			-0.003 (0.30)	
adf			0.056 (2.59) ^a			0.072 (3.43) ^a			0.065 (3.01) ^a
deter	0.002 (5.07) ^a	0.002 (2.87) ^a	0.001 (2.76) ^a				0.001 (2.94) ^a	0.001 (2.03) ^b	0.001 (2.09) ^b
ADT				0.062 (2.96) ^a	0.055 (2.62) ^a	0.072 (3.40) ^a	0.047 (2.24) ^b	0.048 (2.35) ^b	0.060 (2.81) ^a
Constant	3.764 (1.16)	4.770 (1.37)	14.339 (0.03)	0.633 (0.05)	1.539 (0.14)	11.703 (0.01)	2.938 (0.27)	12.113 (0.02)	11.912 (0.02)
Observations	207	207	207	207	207	207	207	207	207
No. of group	23	23	23	23	23	23	23	23	23
loglikelihood	-164.42	-164.74	-161.41	-165.149	-163.996	-159.268	-161.939	-162.06	-157.468
/ln_r	16.728	15.541	17.509	6.356	6.360	18.987	7.853	15.935	17.893
/ln_s	14.129	12.750	3.731	1.933	2.043	1.926	3.629	3.027	2.782
chibar ²	0.00	0.00	0.06	4.10	4.30	8.49	0.08	0.67	1.19
Significant level	1.000	1.000	0.400	0.021	0.019	0.002	0.391	0.207	0.138

Absolute valued of z statistics in parentheses; ^c significant at 10%, ^b significant at 5%, ^a significant at 1%.

Table 4-1 Empirical result for Sino-US

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ad	ad	ad	ad	ad	ad	ad
t	0.189 (3.91) ^a	0.204 (4.20) ^a	0.209 (4.35) ^a	0.230 (4.72) ^a	0.065 (0.83)	0.241 (4.94) ^a	0.276 (4.91) ^a
tus	-0.230 (4.54) ^a	-0.253 (4.99) ^a	-0.282 (5.59) ^a	-0.288 (5.66) ^a	-0.125 (1.56)	-0.290 (5.70) ^a	-0.332 (5.76) ^a
grgdp1	-0.082 (2.04) ^b	-0.078 (1.99) ^b	-0.077 (2.01) ^b	-0.062 (1.68) ^c	-0.079 (2.51) ^b	-0.059 (1.62) ^c	-0.068 (1.62) ^c
grgdp1us	-0.033 (0.59)	-0.045 (0.82)	-0.055 (1.06)	-0.056 (1.07)	-0.031 (0.63)	-0.063 (1.19)	-0.067 (1.19)
rimp1	0.741 (8.97) ^a	0.600 (6.12) ^a	0.550 (5.95) ^a	0.526 (6.58) ^a	0.608 (6.60) ^a	0.371 (4.76) ^a	0.567 (7.10) ^a
rimp1us	0.412 (2.55) ^b	0.874 (5.11) ^a	0.921 (6.16) ^a	0.926 (5.87) ^a	0.859 (5.15) ^a	1.041 (5.63) ^a	0.296 (2.36) ^b
Inrex	0.103 (0.22)	-0.108 (0.22)	0.026 (0.05)	-0.038 (0.07)	-0.230 (0.46)	-0.068 (0.13)	0.012 (0.02)
Inrexus	0.401 (0.72)	0.648 (1.13)	0.633 (0.95)	0.620 (0.97)	0.747 (1.30)	0.624 (1.04)	0.382 (0.64)
Indist		-0.306 (2.09) ^b	-0.317 (2.26) ^b	-0.457 (3.44) ^a	-0.294 (2.18) ^b	-0.614 (4.86) ^a	-0.051 (0.29)
Indistus		0.886 (4.91) ^a	1.063 (6.26) ^a	1.067 (6.27) ^a	0.874 (5.13) ^a	1.245 (6.92) ^a	0.144 (0.73)
TFT			0.336 (1.24)				
TFTus			0.413 (1.39)				
ADL				0.019 (3.74) ^a			
ADLus				-0.000 (0.03)			
adf					0.053 (2.14) ^b		
adfus					-0.072 (2.58) ^b		
deter						0.002 (4.83) ^a	
deterus						-0.001 (0.70)	
ADT							0.077 (3.50) ^a
ADTus							-0.018 (0.79)
Usdummy	0.032 (0.01)	-8.897 (2.62) ^a	-10.443 (2.75) ^a	-9.909 (2.75) ^a	-7.240 (2.11) ^b	-11.440 (3.32) ^a	-0.165 (0.04)
Constant	-2.027 (0.88)	1.522 (0.52)	0.789 (0.24)	1.966 (0.63)	0.338 (0.11)	3.529 (1.23)	-2.309 (0.69)
Observations	753	753	753	753	753	753	753
Pseudo R ²	0.1029	0.1207	0.1408	0.1350	0.1247	0.1282	0.1610
Overdispersion	0.668	0.535	0.399	0.467	0.513	0.488	0.282
alpha							

Robust z statistics in parentheses; ^c significant at 10%, ^b significant at 5%, ^a significant at 1%

Table4-2 Empirical result for Sino-US (cont'd)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ad	ad	ad	ad	ad	ad	ad	ad	ad
t	0.242 (5.02) ^a	0.242 (4.98) ^a	0.130 (1.71) ^c	0.278 (5.13) ^a	0.275 (5.18) ^a	0.108 (1.46)	0.279 (5.54) ^a	0.277 (5.42) ^a	0.138 (1.92) ^c
tus	-0.315 (6.23) ^a	-0.301 (5.95) ^a	-0.190 (2.45) ^b	-0.352 (6.30) ^a	-0.340 (6.22) ^a	-0.176 (2.35) ^b	-0.353 (6.77) ^a	-0.344 (6.51) ^a	-0.208 (2.85) ^a
grgdp1	-0.059 (1.64) ^c	-0.059 (1.61)	-0.060 (1.97) ^b	-0.068 (1.65) ^c	-0.059 (1.49)	-0.061 (1.98) ^b	-0.056 (1.45)	-0.056 (1.44)	-0.051 (1.71) ^c
grgdp1us	-0.073 (1.46)	-0.060 (1.15)	-0.049 (1.00)	-0.072 (1.33)	-0.072 (1.34)	-0.059 (1.21)	-0.084 (1.62)	-0.075 (1.41)	-0.067 (1.39)
rimp1	0.362 (4.74) ^a	0.375 (4.67) ^a	0.390 (5.32) ^a	0.538 (6.74) ^a	0.532 (7.07) ^a	0.585 (7.90) ^a	0.403 (4.86) ^a	0.407 (4.79) ^a	0.451 (5.61) ^a
rimp1us	1.136 (7.05) ^a	1.232 (6.36) ^a	1.010 (5.59) ^a	0.432 (3.22) ^a	0.345 (2.72) ^a	0.268 (2.20) ^b	0.573 (3.91) ^a	0.582 (4.14) ^a	0.348 (2.57) ^b
Lnrex	0.006 (0.01)	-0.052 (0.10)	-0.155 (0.30)	0.136 (0.22)	0.061 (0.10)	-0.158 (0.27)	0.125 (0.21)	0.052 (0.10)	-0.081 (0.14)
lnrexus	0.648 (0.97)	0.600 (0.98)	0.688 (1.16)	0.371 (0.53)	0.383 (0.60)	0.530 (0.85)	0.382 (0.57)	0.360 (0.60)	0.472 (0.77)
Lndist	-0.603 (4.82) ^a	-0.612 (4.80) ^a	-0.587 (4.94) ^a	-0.061 (0.36)	-0.201 (1.08)	-0.020 (0.14)	-0.368 (1.99) ^b	-0.379 (1.98) ^b	-0.294 (1.81) ^c
lndistus	1.317 (7.68) ^a	1.058 (5.78) ^a	1.225 (7.07) ^a	0.358 (1.80) ^c	0.343 (1.63) ^c	0.110 (0.66)	0.657 (2.95) ^a	0.377 (1.65) ^c	0.455 (2.21) ^b
TFT	0.112 (0.42)			0.317 (1.09)			0.148 (0.54)		
TFTus	0.653 (2.21) ^b			0.250 (0.79)			0.422 (1.40)		
ADL		0.002 (0.25)			0.013 (2.27) ^b			-0.001 (0.16)	
ADLus		0.023 (2.49) ^b			0.005 (0.68)			0.024 (2.50) ^b	
adf			0.042 (1.80) ^c			0.069 (3.08) ^a			0.058 (2.58) ^b
adfus			-0.062 (2.28) ^b			-0.091 (3.66) ^a			-0.080 (3.21) ^a
deter	0.002 (4.92) ^a	0.002 (3.36) ^a	0.002 (4.26) ^a				0.001 (4.09) ^a	0.001 (3.00) ^a	0.001 (3.29) ^a
deterus	-0.002 (2.03) ^b	-0.004 (3.33) ^a	-0.001 (0.60)				-0.001 (1.35)	-0.003 (2.97) ^a	-0.000 (0.16)
ADT				0.075 (3.47) ^a	0.061 (2.52) ^b	0.088 (4.25) ^a	0.048 (2.14) ^b	0.048 (2.06) ^b	0.062 (2.72) ^a
ADTus				-0.024 (1.07)	-0.003 (0.11)	-0.028 (1.31)	0.002 (0.09)	0.010 (0.40)	-0.003 (0.12)
Usdummy	-12.374 (3.29) ^a	-9.730 (2.77) ^a	-9.889 (2.86) ^a	-2.005 (0.50)	-1.867 (0.49)	2.286 (0.62)	-4.742 (1.19)	-2.174 (0.59)	-0.843 (0.23)
Constant	3.036 (0.95)	3.412 (1.17)	2.398 (0.84)	-2.984 (0.82)	-1.369 (0.40)	-4.206 (1.24)	-0.159 (0.05)	0.367 (0.11)	-1.802 (0.55)
Observ-	753	753	753	753	753	753	753	753	753
Pseudo R ²	0.1482	0.1404	0.1314	0.1741	0.1740	0.1681	0.1784	0.1785	0.1718
Overdispersion alpha	0.361	0.442	0.472	0.234	0.261	0.259	0.212	0.237	0.238

Robust z statistics in parentheses; ^c significant at 10%, ^b significant at 5%, ^a significant at 1%

Table 5: Comparisons

	Variables	U.S.	China	comparison	Results from the literature
Macro-economics	<i>GRGDP</i>	—	—	N	Knetter and Prusa (2003)—; Moore and Zanardi (2006) —; Sadni-Jallab et al (2005) ²⁵ —; Feinberg (2005) —; Blonigen (2005) —; Mah et al (2006) ²⁶ ns; Vandenbussche and Zanardi(2007) ns;
	<i>REX</i>	+	ns	N	Feinberg(1989) +; Knetter and Prusa (2003)+; Raafat et al (2002)+; Sadni-Jallab et al (2005)+; Blonigen (2005)+; Feinberg (2005) +; Francois and Niels (2004) ns; Irwin(2005) +; Niels and Francois (2006)+; Vandenbussche and Zanardi(2007) ns;
	<i>RIMP</i>	+	+	Y	Blonigen and Bown (2003)+; Blonigen (2005)+; Deardorff and Stern(2005)+; Irwin(2005)+; Herander and Schwartz (1984) ²⁷ +; Irwin(2005) +; Leidy(1997) ns; Sadni-Jallab et al (2005) ns;
Retaliation	<i>TFT</i>	+	ns	N	Prusa and Skeath (2004) ²⁸ +/-; Feinberg and Reynolds (2005, 2006) ²⁹ +;
	<i>ADL</i>	+	ns/+	Y/N	Prusa and Skeath(2004)+; Feinberg and Reynolds (2006) ³⁰ +;
	<i>ADF</i>	—	+	Y	Aggarwal (2004) ³¹ +/ns;
	<i>DETER</i>	ns	+	Y/N	Feinberg and Reynolds (2006) ³² +;
Contagion	<i>ADT</i> (current year)	+	+	N	none
	<i>ADT</i> (previous year)	+	ns	N	none ³³
Distance	<i>DIST</i>	+	—	Y	none
Time trend	<i>T</i>	—	+	Y	none

Note that “+”, “-”, “ns” and “none” respectively denoting the variable being significantly positive, significantly negative, not significant, not included in any previous research; “Y” and “N” simply means whether China and the US are significantly different in the same variable or not.

²⁵ Sadni-Jallab et al (2005) found the coefficient of real GDP grow rate is significantly negative for the US but not significant for the EU.

²⁶ Mah et al (2006) show that there is no statistically significant unidirectional relationship running from GDP to change of antidumping cases at one percent level of significance.

²⁷ Herander and Schwartz (1984) found IMP significantly influence domestic firm’s complaint decision but has no significant influence on USITC’s injury decision.

²⁸ In Prusa and Skeath (2004), they used a dummy variable whether country j is a member of the “AD club” prior to year t to denote club effect. They show evidence of using AD for both club effect and tit-for-tat reasons for traditional users. New users have a more significant club effect, but a negative tit-for-tat effect.

²⁹ Feinberg and Reynolds (2005,2006) uses a dummy variable that indicates whether the exporting country filed an antidumping case against the importing country during the past year to capture tit-for-tat effects. Since most game theory models emphasize the immediacy of retaliation (i.e., within the next year), which is more precisely measured in one-year lagged case filings rather than over a longer time period.

³⁰ Feinberg and Reynolds (2006) uses country dummy to identify “club effects” for five traditional AD users, namely Australia, Canada, the European Union, New Zealand and the United States.

³¹ Aggarwal (2004) proved that ADF is significant positive for all the developing countries, especially for low and middle income groups. However it is insignificant for developed countries.

³² They use a slightly different variable to capture “deter” effect, namely the exporting country’s total worldwide filings the previous year interacted with the importing country’s total exports to that country in billions of dollars.

³³ Feinberg and Reynolds (2005, 2006) include a similar variable to capture deflection effect which equals the number of global antidumping cases filed the previous year in the particular industry category, excluding those filed against the importer being considered.

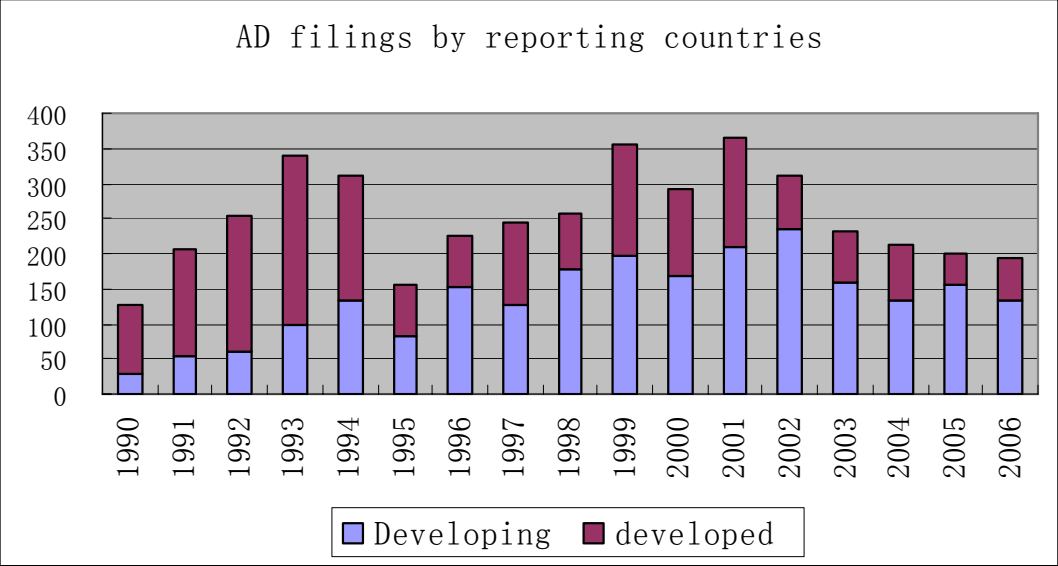


Figure 1

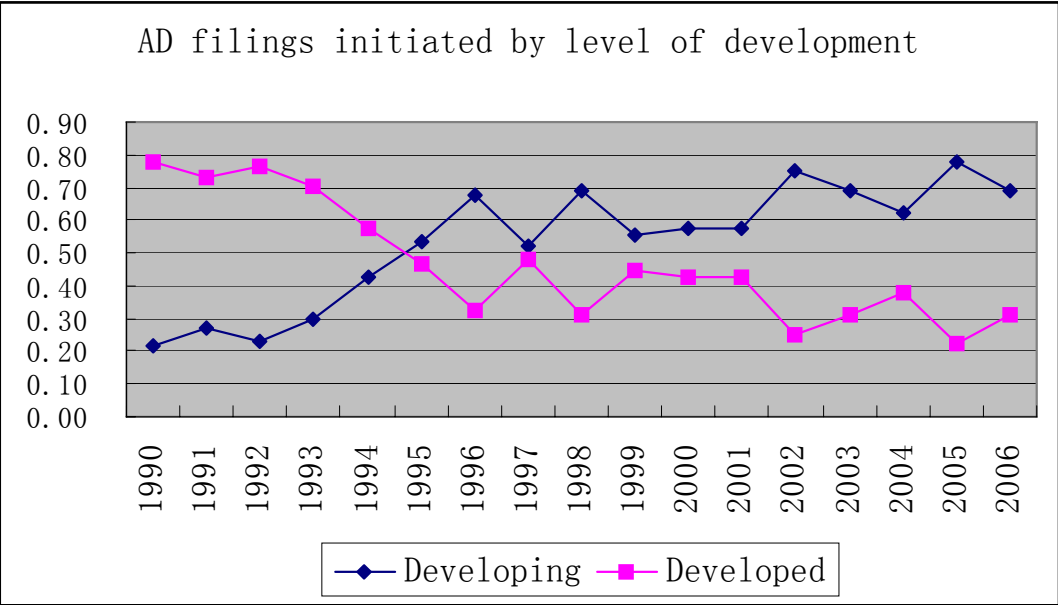


Figure 2

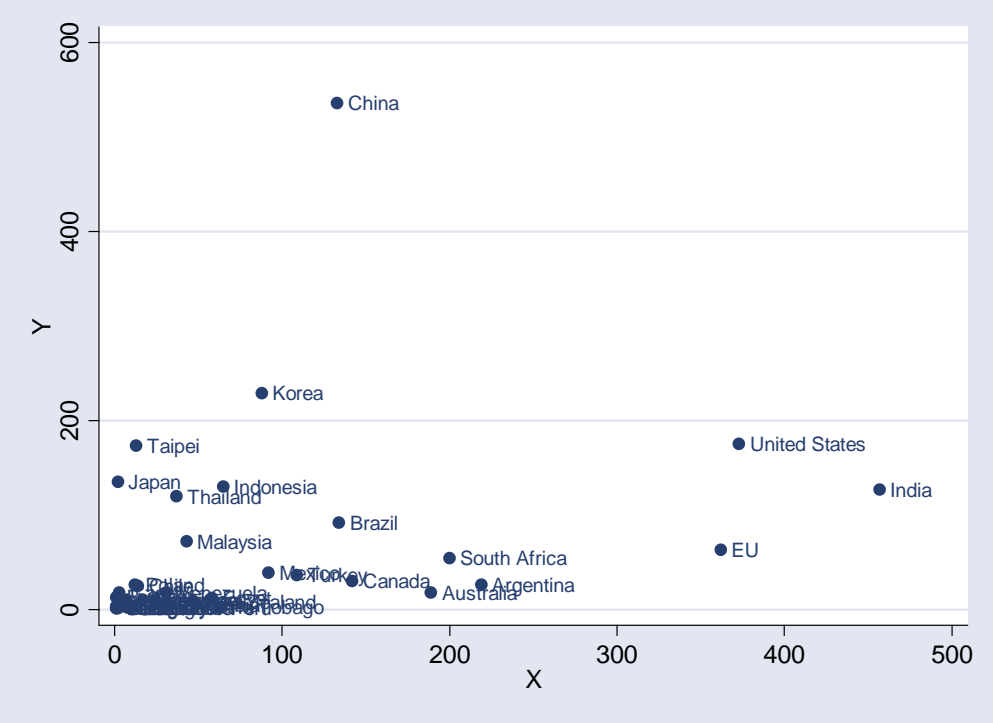


Figure 3: asymmetry for a country as a plaintiff and as a defendant

Table A1: AD filings by exporting and reporting member 1995-2006

<i>Country</i>	<i>Targeted</i>	<i>Initiations</i>	<i>asymmetry</i>
<i>Argentina</i>	26	219	0.12
<i>Australia</i>	18	189	0.10
<i>Brazil</i>	92	134	0.69
<i>Bulgaria</i>	13	1	13.00
<i>Canada</i>	30	142	0.21
<i>Chile</i>	25	14	1.79
<i>China</i>	536	133	4.03
<i>Taipei</i>	173	13	13.31
<i>Colombia</i>	5	32	0.16
<i>Costa Rica</i>	2	8	0.25
<i>Czech</i>	18	3	6.00
<i>Ecuador</i>	2	1	2.00
<i>Egypt</i>	12	58	0.21
<i>EU</i>	63	362	0.17
<i>Guatemala</i>	3	1	3.00
<i>India</i>	127	457	0.28
<i>Indonesia</i>	130	65	2.00
<i>Israel</i>	7	31	0.23
<i>Japan</i>	135	2	67.50
<i>Jordan</i>	1	1	1.00
<i>Korea</i>	229	88	2.60
<i>Latvia</i>	7	7	1.00
<i>Lithuania</i>	10	7	1.43
<i>Malaysia</i>	72	43	1.67
<i>Mexico</i>	39	92	0.42
<i>New Zealand</i>	8	47	0.17
<i>Nicaragua</i>	1	2	0.50
<i>Pakistan</i>	10	24	0.42
<i>Paraguay</i>	1	1	1.00
<i>Peru</i>	2	63	0.03
<i>Philippines</i>	10	17	0.59
<i>Poland</i>	26	12	2.17
<i>Slovenia</i>	2	1	2.00
<i>South Africa</i>	54	200	0.27
<i>Thailand</i>	120	37	3.24
<i>Trinidad and Tobago</i>	3	12	0.25
<i>Turkey</i>	36	109	0.33
<i>United States</i>	175	373	0.47
<i>Uruguay</i>	3	6	0.50
<i>Venezuela</i>	18	31	0.58
<i>All the 40 countries</i>	2244	3038	0.74

Table A1: AD filings by exporting and reporting member 1995-2006 (cont'd)

<i>Country</i>	<i>Targeted</i>	<i>Initiations</i>	<i>Country</i>	<i>Targeted</i>	<i>Initiations</i>
<i>Jamaica</i>	0	4	<i>Luxembourg</i>	3	0
<i>Panama</i>	0	2	<i>Macau</i>	2	0
<i>Algeria</i>	2	0	<i>Macedonia</i>	8	0
<i>Austria</i>	14	0	<i>Malawi</i>	1	0
<i>Bahrain</i>	1	0	<i>Moldova</i>	3	0
<i>Bangladesh</i>	1	0	<i>Mozambique</i>	1	0
<i>Belarus</i>	11	0	<i>Nepal</i>	2	0
<i>Belgium</i>	20	0	<i>Netherlands</i>	27	0
<i>Bosnia Herzegovina</i>	1	0	<i>Nigeria</i>	1	0
<i>Croatia</i>	6	0	<i>Norway</i>	5	0
<i>Cuba</i>	2	0	<i>Oman</i>	1	0
<i>Denmark</i>	7	0	<i>Portugal</i>	6	0
<i>Dominican Republic</i>	1	0	<i>Qatar</i>	1	0
<i>Estonia</i>	4	0	<i>Romania</i>	34	0
<i>Faroe Islands</i>	2	0	<i>Russia</i>	101	0
<i>Finland</i>	11	0	<i>Saudi Arabia</i>	15	0
<i>France</i>	38	0	<i>Serbia and Montenegro</i>	3	0
<i>Georgia</i>	1	0	<i>Singapore</i>	41	0
<i>Germany</i>	78	0	<i>Slovak Republic</i>	10	0
<i>Greece</i>	6	0	<i>Spain</i>	42	0
<i>Honduras</i>	1	0	<i>Sri Lanka</i>	1	0
<i>Hong Kong</i>	21	0	<i>Sweden</i>	15	0
<i>Hungary</i>	14	0	<i>Switzerland</i>	6	0
<i>Iran</i>	15	0	<i>Ukraine</i>	59	0
<i>Ireland</i>	6	0	<i>United Arab Emirates</i>	10	0
<i>Italy</i>	44	0	<i>United Kingdom</i>	41	0
<i>Kazakstan</i>	24	0	<i>Uzbekistan</i>	3	0
<i>Korea, PDR</i>	1	0	<i>Viet Nam</i>	18	0
<i>Libya</i>	2	0	<i>Yugoslavia</i>	3	0
<i>Liechtenstein</i>	1	0	<i>Zimbabwe</i>	2	0
<i>All 30 countries</i>	335	6	<i>All 30 countries</i>	462	0

Table A2-1: AD filings (China as exporting/reporting member 1995-2006)

<i>China as targeted</i>				<i>China as plaintiff</i>			
1	India	93	17.35%	1	Japan	26	19.55%
2	EU	72	13.43%	2	Korea,	24	18.05%
3	US	64	11.94%	3	US	20	15.04%
4	Argentina	50	9.33%	4	Chinese Taipei	12	9.02%
5	Turkey	43	8.02%	5	EU	8	6.02%
6	Brazil	26	4.85%	6	Russia	8	6.02%
7	South Africa	26	4.85%	7	Singapore	5	3.76%
8	Australia	24	4.48%	8	Germany	4	3.01%
9	Mexico	22	4.10%	9	India	4	3.01%
10	Canada	18	3.36%	10	Indonesia	3	2.26%
	Top 10	438	81.72%		Top 10	114	85.71%
	All other	98	18.28%		All other	19	14.29%
	Total	536	100.00%		Total	133	100.00%

Table A2-2: AD filings (US as exporting/reporting member 1995-2006)

<i>US as targeted</i>				<i>US as plaintiff</i>			
1	Mexico	25	14.29%	1	China	64	17.16%
2	India	24	13.71%	2	Japan	32	8.58%
3	Brazil	23	13.14%	3	Korea	25	6.70%
4	China	20	11.43%	4	India	19	5.09%
5	Canada	17	9.71%	5	Taipei	18	4.83%
6	Argentina	11	6.29%	6	Indonesia	16	4.29%
7	EU	11	6.29%	7	South Africa	15	4.02%
8	Korea	10	5.71%	8	Canada	14	3.75%
9	South Africa	9	5.14%	9	Germany	14	3.75%
10	Australia	7	4.00%	10	Mexico	14	3.75%
	Top 10	157	89.71%		Top 10	231	61.93%
	All other	18	10.29%		All other	142	38.07%
	Total	175	100.00%		Total	373	100.00%

Table A3-1: Top 15 AD users and China's top 15 targets (1995-2006)

<i>Top 15 AD users excluding China</i>				<i>China's top 15 targets</i>			
1	India	457	15.01%	1	Japan	26	19.55%
2	US	373	12.25%	2	Korea	24	18.05%
3	EU	362	11.89%	3	US	20	15.04%
4	Argentina	219	7.19%	4	Chinese Taipei	12	9.02%
5	South Africa	200	6.57%	5	EU	8	6.02%
6	Australia	189	6.21%	6	Russia	8	6.02%
7	Canada	142	4.66%	7	Singapore	5	3.76%
8	Brazil	134	4.40%	8	Germany	4	3.01%
10	Turkey	109	3.58%	9	India	4	3.01%
11	Mexico	92	3.02%	10	Indonesia	3	2.26%
12	Korea	88	2.89%	11	Malaysia	3	2.26%
13	Indonesia	65	2.14%	12	Netherlands	3	2.26%
14	Peru	63	2.07%	13	France	2	1.50%
15	Egypt	58	1.91%	14	United Kingdom	2	1.50%
16	New Zealand	47	1.54%	15	Belgium	1	0.75%
	Top 15	2598	85.35%		Top 15	125	93.98%
	All other	446	14.65%		All other	8	6.02%
	Total	3044	100.00%		Total	133	100.00%

Table A3-2: Top 15 AD users and the US's top 15 targets (1995-2006)

<i>Top 15 AD users excluding US</i>				<i>US's top 15 targets</i>			
1	India	457	15.01%	1	China	64	17.16%
3	EU	362	11.89%	2	Japan	32	8.58%
4	Argentina	219	7.19%	3	Korea	25	6.70%
5	South Africa	200	6.57%	4	India	19	5.09%
6	Australia	189	6.21%	5	Chinese Taipei	18	4.83%
7	Canada	142	4.66%	6	Indonesia	16	4.29%
8	Brazil	134	4.40%	7	South Africa	15	4.02%
9	China	133	4.37%	8	Canada	14	3.75%
10	Turkey	109	3.58%	9	Germany	14	3.75%
11	Mexico	92	3.02%	10	Mexico	14	3.75%
12	Korea	88	2.89%	11	Russia	11	2.95%
13	Indonesia	65	2.14%	12	Brazil	9	2.41%
14	Peru	63	2.07%	13	Thailand	9	2.41%
15	Egypt	58	1.91%	14	Italy	8	2.14%
16	New Zealand	47	1.54%	15	Spain	8	2.14%
	Top 15	2358	77.46%		Top 15	276	73.99%
	All other	686	22.54%		All other	97	26.01%
	Total	3044	100.00%		Total	373	100.00%