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Piyush Chandra
Colgate University, pchandra@colgate.edu

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Piyush Chandra†
Colgate University

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Abstract

While tariff rates around the world have decreased during the last five decades, there has been an increase in other instruments of protectionism – in particular, antidumping (AD), countervailing duties (CVD) and global safeguards (SG) - collectively, temporary trade barriers (TTBs). In this paper, we examine China's use of these TTBs both before and during the 2008-9 crisis in order to identify underlying historical trends and explore potential changes in their use over time. While the flow of new AD investigations increased during the crisis, China's total stock of imports subject to AD measures decreased in terms of both *count* and *value*. Despite this decrease in the stock of imports subject to AD, we find a number of worrying trends. An increase in the flow of AD investigations during the crisis was a reversal of the trend from last five years. Second, prior to the crisis, almost all of China's AD use was confined to only five Harmonized System (HS) sectors, however, during the crisis, some new AD investigations were in sectors that had never participated in AD earlier. In addition, a large number of China's AD measures have lasted for longer than five years. At the end of 2009, only 40% of the AD cases imposed five or more years ago have been removed. However, not all news is bad. The size of the *ad valorem* AD duty has decreased in recent years. Also, through 2009, very few Chinese firms have participated as petitioners with most of them participating only once. We also find several differences in China's AD use across developed and developing trading partners both before and during the crisis. For instance, not only all of China's AD measures through 2009 disproportionately targeted developed countries but also the entire increase in AD investigations by *new* sectors during the crisis years was directed against developed countries.

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Contact: Piyush Chandra, Department of Economics, Colgate University, 13 Oak Drive, Hamilton, NY USA 13346. Email: pchandra@colgate.edu, Web: www.colgate.edu/academics/FacultyDirectory/pchandra.html, Tel: +1.315.228.7539, Fax: +1.315.228.7033.

1 Introduction

While tariff rates around the world have decreased during the last five decades, there has been an increase in other instruments of protectionism – in particular, antidumping (AD), countervailing duties (CVD) and global safeguards (SG) - collectively, temporary trade barriers (TTBs). In this paper, we examine China's use of these TTBs both before and during the 2008-9 crisis in order to identify underlying historical trends and explore potential changes in their use over time.

It is important to understand China's use of TTBs given that it is one of the leading importers in the world. Figure 1a illustrates that not only has China's economy been growing, its imports have also been expanding rapidly. China's real exports fell slightly during the 2008-9 crisis; however, its real imports continued to increase even during this period.[1] By the end of 2009, China was the world's third largest importer with merchandise imports of more than $1 trillion, following only the EU and USA with imports of $1.7 and $1.6 trillion, respectively (WTO, 2010). The scale of imports at stake is reason enough to study the frequency with which China uses these TTBs.

The 2008-9 crisis had much smaller macroeconomic effects on China than it did on many other countries. China's economy continued to grow and its unemployment rate has remained stable; however, Figure 1b illustrates how its growth rate did decrease during this period. China's real GDP growth rate had increased from 7.5% in 1998 to above 13% by 2007, only to fall to 9% in 2008.

Figure 1a also documents how a rapid reduction in China's average tariffs coincided with the dramatic increase in China's imports during 1995-2009. China's average applied MFN tariff decreased from roughly 40% in 1993 to 17% in 2000. China's accession to the WTO in December 2001 was associated with a further tariff reduction of roughly 6 percentage points. By the end of 2008, its average applied MFN tariff had decreased to 9.6%.

China began to use TTBs as an alternative form of protection while its tariffs were falling during this period (Messerlin, 2004). China enacted its first antidumping law in March 1997, and it was investigating 20-30 cases per year in each of the first few years following its WTO accession (Bown, 2010c). In this paper, we extend the analysis of previous studies by examining China's use of all TTB policies through 2009, examining both new initiations of investigations and instances in which China imposed new measures. Furthermore, as China's TTB use is dominated by antidumping, we explore China's use of AD in further detail. We examine its composition across sectors, the groups of foreign

[1] Later, we show that China's non-oil imports, measured in nominal terms, fell during 2008-9. Throughout the rest of the paper any discussion of imports refers to the non-oil nominal value unless otherwise noted.

countries that China has targeted, and the time duration of the measures imposed.[2]

Our results indicate interesting patterns to China's AD investigations prior to and during the 2008-9 crisis. China initiated a large number of new AD investigations in 2002, immediately after its December 2001 entry to the WTO. Except in 2004, the number of new Chinese AD investigations decreased in each year during 2003-7. However, during 2008-9 the number of new AD investigations again began to increase. This pattern holds under a number of different metrics—whether we consider the number of AD cases, the share of Harmonized System (HS) 6-digit products involved in AD investigations, or the share of China's import value affected by AD investigations.

Despite this increase in the flow of new AD investigations during the 2008-9 crisis, the total stock of products under Chinese AD measures actually decreased during this period due to the removal of several previously-imposed AD measures. For instance, 0.3% and 0.4% of China's HS 6-digit products were involved in new AD investigations in 2008 and 2009, respectively. However, during the same period, China's total stock of HS 6-digit products subject to AD measures decreased from 1.1% to 1.0%.

In terms of China's industries, chemicals, paper and pulp, plastics and rubber, steel, and textiles have been the main sectors petitioning for AD investigations during 1997-2009. The chemicals sector has dominated China's AD use with 104 of the 172 (60%) AD cases investigated during 1997-2009. However, in terms of the share of import value, only 8.6% of the imports in the chemicals sector were subject to AD measures at its within-period peak in 2008. Perhaps surprisingly, this figure is comparable to other sectors with many fewer investigations such as paper and pulp, plastics and rubber and steel, each of which had a stock of roughly 8% of industry imports subject to AD measures at their respective peaks.

Since the increase in the number of new Chinese AD investigations during the crisis coincided with a period that also saw a large number of measures being removed, we also investigate whether the new investigations were filed largely to replace those being removed. The data quickly rules out such an explanation. While in the years prior to the crisis China's AD activity was dominated by relatively few sectors, a number of 'new' sectors that had never previously used AD sought initiations in 2008-9. At the same time, other traditional users of AD in China such as paper and pulp and textiles did not file any new AD investigations, even though several previously-imposed AD measures on products from these sectors were removed.

[2] We use the World Bank's Temporary Trade Barriers Database (Bown, 2010b) for data on China's use of TTBs. In addition, we use imports data from COMTRADE and tariff data from TRAINS via WITS. Further details on the data can be found in Bown (2011).

Next, we provide evidence that China uses AD to target both developing and *developed* trading partners. The EU, Japan, South Korea and USA are four of the largest targets of China's AD activity, together accounting for 111 of the 172 (65%) AD cases that China filed during 1997-2009. These four economies also accounted for 62% of the total stock of HS 6-digit product-country combinations subject to Chinese AD measures by 2009. China's AD use exhibits other important differences depending on whether the AD targeted a developed or developing trading partner. For instance, while the total stock of HS 6-digit product-country combinations affected by AD measures decreased in 2009 compared to 2008 for both groups, the decline was much greater for developing economy exporters than the developed economy exporters.

An important question regarding China's AD use during the 2008-9 crisis is the extent to which it is motivated by retaliation. For example, China initiated AD investigations on imports of chicken parts and autos from the US almost immediately after the US imposed a safeguard on imports of Chinese tires in September 2009.[3] Many interpreted the timing of the new Chinese investigations as a direct response to the US actions and raised the concern of a potential 'trade war'. Other Chinese AD cases with potential retaliatory motives include China imposing its own AD duty on steel fasteners from the EU within months of the EU initiating an AD investigation on steel fasteners from China (Bown, 2010b).[4]

While these examples are suggestive of retaliation being a contributing motive to China's AD use, this evidence is merely anecdotal. Furthermore, while Bown (2010a) has found that a higher share of China's exports to *developing* countries are affected by their AD than its exports to developed countries, nevertheless we find that the majority of China's AD measures targeted imports from *developed* countries. Even among the set of developed countries, one of China's main AD targets is Japan, a country that has not used AD actively against China.

We examine other features of China's antidumping use during 1997-2009, including the size of duties imposed, the relationship to changes in its applied tariffs, and the duration of imposed measures. China's average ad valorem AD duty in 2009 was roughly 20% as opposed to the within-period peak of more than 95% in 2005. Furthermore, products that experienced a larger

[3] China eventually imposed antidumping duties as high as 105% on chicken parts in September 2010. China also initiated and imposed CVD measures on chicken parts.

[4] EU producers initiated an AD investigation against imports of steel fasteners from China in November 2007. China responded by initiating an AD investigation against steel fasteners from the EU in December 2008. Both economies targeted imports of identical HS 6-digit products from each other's market (the most disaggregated level at which the classification is comparable across countries), though the varieties of the product produced by each country are likely to be different.

reduction in China's applied tariff during its WTO accession were more likely to be involved in a subsequent AD investigation. Finally, even though the modal duration of Chinese AD measures is five years (excluding AD measures in force as of end-2009), there are a number of products for which the ongoing AD measures have been in place for much longer. In fact, China's record in removing AD orders after the mandated *sunset review* within five years is very poor. Only 40% of the AD measures that China imposed during 1999-2004 were removed by the end of 2009.

The last item we explore is the Chinese firm-level involvement in AD investigations as petitioners, finding only a small number of participating firms. Excluding the nine instances in which an industry association filed the AD petition, only 141 firms participated as petitioners in investigations during 1997-2009. Furthermore, many of the firms participated in only one AD case.

The rest of this paper proceeds as follows. Section 2 constructs count and value-based measures described in Bown (2011) and documents broad trends in China's use of TTBs. Section 3 investigates the sectoral composition of China's AD use, and Section 4 examines China's AD use across different groups of targeted countries. Section 5 highlights the relationship between China's tariff liberalisation and its subsequent AD use, trends in AD duties, and the average duration of Chinese AD measures. Section 6 illustrates the participation of Chinese firms as petitioners in AD investigations. Finally, Section 7 concludes.

2 China's use of TTBs

2.1 Broad trends in China's TTBs

Given that antidumping duty laws have been around for over a century, China is one of the more recent users of AD. While China established the principles of AD in its Foreign Trade Law of 1994, it enacted its first antidumping law - the Anti-dumping and Anti-subsidy Regulation - only in 1997 (Yu, 2005). China initiated its first AD investigation in 1997, and by the end of 2009 it had investigated 172 separate AD cases.

Figure 2a shows the total number of China's AD investigations during this period by year.[5] While China initiated only three AD investigations in 1997, it gradually started increasing the number of AD investigations until 2002. However, China initiated 30 new AD cases in the year immediately

[5] In Figure 2, we treat the European Union (EU) as a single economy and drop the duplicate cases in which two or more EU members are investigated. For instance, in December 2000, China initiated an AD investigation for dichloromethane (methylene chloride) against four members of the EU: France, Germany, the Netherlands and UK. We count this as one case against the EU. For consistency, we define 'EU' as all 27 countries for the entire period even though some countries became members only midway through the period.

following its entry into the WTO, twice as many as in 2001.

There could be several explanations for this increase in the number of AD cases in 2002. The first is the timing related to China's December 2001 WTO entry. Prior to 2001, China was free to use other measures of trade policy and thus there was no need to use AD. Because China's WTO accession was associated with a decrease in its applied import tariffs, this could have triggered an increase in demand for non-tariff barriers such as AD. A second contributing explanation could be China's adoption of a new set of AD regulations. China's first AD law in 1997 was far from complete, and a number of its administrative procedures led to confusion. For instance, the basis for calculating dumping margins for a preliminary affirmative determination was not disclosed to interested parties, and the determination of injury and causation was not based on an objective examination of sufficient evidence (Choi and Gao, 2006). As part of its accession to the WTO, China enacted a more comprehensive and WTO consistent set of rules guiding AD and CVD.[6] Finally, a third possible explanation could be a potential slowdown in the growth rate of China's economy during 2001-2 (see again Figure 1b).

After the increase in China's AD filings in 2002, the number of new AD cases decreased each year until 2008 when the trend reversed.[7] That the increase in new AD cases coincided with the onset of the crisis is not necessarily evidence of a causal link. In fact, the average number of 14 investigations during the 2008-9 crisis period is similar to that of the pre-crisis period (1997-2007).

Figure 2a also illustrates that a large share of China's AD investigations targeted developed trading partners. Of the 172 AD cases initiated by China during 1997-2009, 138 (80%) were directed at developed economies. This is not surprising since developed economies account for a large fraction of China's total imports. Figure 2b shows China's non-oil imports during this period broken down by developed and developing trading partners. Even in 2009, China's imports from developed countries were $612 billion as opposed to approximately $200 billion from developing countries.

Table 1 reports more details on Chinese AD investigations as well as their outcomes. Of the 166 AD cases that China initiated during 1997-2009 in which a final decision has been made, 135

[6] The revision in 2002 was one of the main reforms to China's AD regulations, though a number of other smaller changes have taken place since. For instance, in July 2004, China revised its AD rules to make the newly constructed Ministry of Commerce People's Republic of China (MOFCOM) take AD responsibilities away from the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) and The State Economic and Trade Commission (SETC). Another change during June 2004 was to include a clause that directs MOFCOM to consider public interest in AD determinations.

[7] The only exception to the steady decline over the period 2003-7 was in 2004 when the total number of new AD cases increased to 26 after decreasing to 21 in 2003. Note that one might expect to see a decline in the following year given the large number of AD cases investigated in 2002. However, in 2003 the total number of cases was still higher than the 1997-2009 average.

(81%) cases ultimately resulted in the imposition of a final AD measure.[8] Furthermore, almost all Chinese AD measures were in the form of ad valorem duties; only eight cases resulted in a price undertaking. Moreover, each of the price undertakings resulted from AD cases initiated prior to the 2008-9 crisis and were directed at developed economies.

Table 1 also documents outcome variation both across years and targeted countries. China imposed a final AD measure in only 13 of the 24 AD cases (54%) filed in 2005; much lower than the period average of 81%. Of the 134 AD cases that China filed against developed countries, 110 (82%) resulted in the imposition of a final AD measure, compared to 25 out of 32 cases (78%) filed against developing countries. Finally, cases targeting developed countries had a higher average ad valorem AD duty rate during 1997-2009.

China has used other temporary trade barriers such as countervailing duties (CVD) and safeguards (SG) in addition to AD. However, it has used AD much more frequently than the other two policies. China initiated its first CVD case in June 2009, and by the end of 2009, it had already initiated three investigations: over steel products, chicken parts and autos. All three CVD cases targeted US exporters and all three had a corresponding AD case.

China has been more restrained in its use of safeguards as it used this TTB only once since its WTO accession. China imposed a safeguard in 2002 over imports of a number of steel products, coinciding with similar safeguards that the US, the EU and a number of other countries imposed. China withdrew the safeguards in 2003 in response to a similar removal by the US and the EU.

2.2 The share of China's imports subject to AD

We start the analysis by constructing stock and flow measures of the relevant TTBs based on Bown (2010a). In particular, we follow equation (1) and equation (2) of Bown (2011) and construct two separate measures of the use of TTBs: (i) based on the *count* of the HS 6-digit products affected by the TTBs as a share of the total number of products imported, and (ii) a *value*-based measure that takes into account the share of China's value of imports affected by TTBs.

Prior to 2006, China used the HS 6-digit product classification to describe the products involved in TTB investigations.[9] Since 2006, China has started using the more disaggregated HS

[8] Six of the 17 cases initiated during 2009 are still being investigated. Of the 31 cases initiated during 1997-2009 that did not result in the imposition of a final AD measure, 17 led to a negative injury determination, five were terminated and nine were withdrawn.

[9] The only exception is the safeguard case initiated in 2002 in which China used the HS 8-digit classification.

8-digit classification.[10] Since a majority of cases (72%) are reported using the HS 6-digit classification, we conduct our analysis at that level. One caveat is that this approach can overstate the total share of imports subject to TTBs for cases initiated after 2006 if only a fraction of the HS 8-digit products within an HS 6-digit category is subject to the TTB investigation. In our case, all the underlying HS 8-digit products were involved in the investigations in only 55% of the HS 6-digit products investigated during 2006-9. However, in order for our comparison across years to be meaningful we rely on the HS 6-digit classification.[11]

Figure 3a summarizes our main results. The top panel refers to China's use of all TTB policies whereas the bottom panel reports its use of AD only. We report the count measure in the left column and the value measure in the right column. The count and the value-based measures have similar time series patterns over 1997-2009. The main difference is that the count measure provides a lower estimate of the share of imports affected by TTBs. For instance, at its within-period peak in 2003, at least 2% of HS 6-digit products in China were under a TTB measure. However, these TTB measures affected more than 4% of the value of China's imports. This implies that China's TTBs disproportionately target relatively high import value products.

One of the most striking observations from the top panel of Figure 3a is a spike in 2002. A large part of this increase is due to China's imposition of the previously mentioned global safeguard on steel products. With the withdrawal of the safeguard measure, China's total stock of products subject to TTB measures decreased to roughly 0.9% in 2004, less than half its level in 2003. Since 2004, the stock of products affected by TTBs remained roughly constant at 1.1% until it fell to 1.0% in 2009.

The bottom panel of Figure 3a focuses on AD only and illustrates an upward trend in China's affected imports until 2005. Under the count measure, the stock of HS 6-digit products under AD more than tripled from 0.3% before China's accession to the WTO to 1.1% in 2005. The increase is even larger under the import value measure, where the share of products affected by AD more than quadrupled from 0.5% in 2001 to 2.2% in 2005.

The stock of products under AD measures remained roughly stable from 2005 until the beginning of the crisis in 2008, before falling in 2009. The decrease in the total *stock* of products under AD is especially notable given that a large number of new AD cases were initiated during 2008-9. The

[10] In two AD cases involving paper and catechol, originally investigated in 2002, China reclassified the products involved in a subsequent review using a finer HS 8-digit classification rather than the original HS 6-digit classification.

[11] While using the HS 6-digit classification might overstate the share of imports affected by AD in terms of the value of imports, the direction of bias in terms of the share of *products* affected by AD could be the opposite. In fact, China initiated AD investigations in 0.8% of the HS 8-digit products with non-zero imports during 2006-9. When we use the HS 6-digit classification for the same period, the share of products affected by AD investigations was only 0.6%.

reduction in the stock is driven by the removal of several existing AD measures during this period. The new AD measures that were imposed during this period covered fewer HS 6-digit products and they accounted for a smaller share of imports by value relative to the AD measures being removed.

The *flow* of new AD investigations reveals a similar pattern over 1997-2009 using either the count or the value of imports. The share of imports affected by new AD investigations increased in 2002, reaching the within-period peak. However, since the 2002 peak, the flow of new AD investigations decreased steadily until 2007. With the onset of the crisis in 2008, the share of products subject to new AD investigations reversed trend and again started to increase.

3 Sectoral targets of China's antidumping

The chemicals sector filed 104 (60%) of the 172 AD cases that China initiated during 1997-2009.[12] The other sectors that China targeted most heavily in its AD investigations are plastics and rubber (32 cases), paper and pulp (14 cases), steel (10 cases) and textiles (7 cases). Together these five sectors account for 97% of China's AD cases.

Nevertheless, there is no obvious trend in the value of industry-level imports to explain this AD pattern. Figure 2c shows China's total non-oil merchandise imports between 1997-2009 for chemicals, paper and pulp, plastics and rubber, and steel.[13] These sectors accounted for between 26-31% of China's total imports each year during 1997-2009, and China's total non-oil imports increased at an average annual rate of 14% during 1997-2009. However, except for the paper and pulp industry where imports grew annually at only 10%, imports in each of the other three leading users of AD (steel, chemicals, and plastics and rubber) grew at an annual rate of 13-15%.

Figure 3b presents the time series pattern of the share of imports affected by China's AD in each sector. The figure uses a slightly modified version of equation (2) from Bown (2011); here we restrict analysis to only the sector in question. Despite accounting for the majority of China's AD cases, the share of *products* affected by AD in chemicals is comparable to the other leading sectors that initiated many fewer cases. At its within-period peak in 2008, about 8.6% of the total stock of imports in the chemicals sector were affected by China's AD. This is similar to the paper and pulp and plastics and rubber industries. And while the steel sector was involved in ten-times fewer AD cases (10 cases) than chemicals (104 cases), China's AD cases over steel products targeted almost as large a share of

[12] The sectors are defined according to the 21 HS sections.

[13] Textiles imports are included in the 'others' category in Figure 2c. Textiles imports decreased as a share of total imports from around 13% in 1996 to around 2% by 2009. Moreover, textiles imports grew only at an annual average rate of 0.8% during 1997-2009.

industry imports, with a peak of 7.4% in 2003.

There are substantial differences across sectors in the time series patterns of AD protection. China's accession to the WTO was accompanied by a flow of new AD investigations in 2002 that accounted for between 2% and 7% of the total imports in each sector. However, since 2002, sectors have had very different patterns to the flow of new AD investigations. China did not initiate any new AD investigation in the steel sector until the beginning of the crisis in 2008. On the other hand, China initiated new investigations in the chemicals sector each year since 2001. In 2009 alone, the chemicals sector had as much as 4.8% of imports under new AD investigations. Moreover, except for paper and pulp and textiles, the flow of new AD investigations has increased during the 2008-9 crisis in all of China's leading sectoral users of AD.

Tables 2a and 2b summarize and provide additional information on China's AD use across sectors. The second column of Table 2a reports the share of HS 6-digit products in a given sector that were involved in an AD investigation during 1997-2009. The next column reports a similar measure but only refers to those products in which an AD measure was imposed. Thus, the difference between these two columns would arise if an investigation resulted in termination or withdrawal or if the investigation is still pending. The fourth column reports the share of China's imports by value of the HS 6-digit products subject to AD measures at any point during 1997-2009.

Table 2a reveals that not all sectors in China have been involved in AD activity; in fact, some sectors that account for a large share of imports (*eg* machinery and electrical) had very little AD activity during 1997-2009. Nevertheless, some sectors that are heavy users of AD also account for a large share of China's total imports. Steel and chemicals accounted for 10% and 9% of China's total merchandise imports during this period, respectively. The products subject to China's AD also accounted for 12% and 13% of the value of steel and chemicals imports, respectively.

Table 2b further breaks down this information into the period before and during 2008-9. Though it is not reported in the table, China's imports fell in 16 of the 21 sectors during the crisis.[14] Some sectors that were heavy users of AD before the crisis did not start new AD investigations during 2008-9 (see again Figure 3b). Table 2b identifies new sectors—*ie* those that initiated AD investigations during the crisis period—and reports the shares of HS 6-digit products under investigation. For example, China initiated new AD investigations on more than 4% of its HS 6-digit products in the transport equipment sector (autos). Other sectors such as animal products (chicken parts) and other

[14] The five sectors in which imports continued to increase during this period were food and beverage, steel, transport equipment, arms and ammunition, and miscellaneous.

instruments started new investigations covering 3.1% and 2% of each industry's imports, respectively.

4 The country targets of China's antidumping

4.1 Countries: overall trends

China initiated AD investigations against 19 different trading partners between 1997 and 2009. South Korea was targeted with 32 AD cases, followed by Japan (31), USA (28), the EU (20) and Taiwan (16). Combined, the countries accounted for 74% of China's AD investigations.

Figure 4a shows the cumulative annual stock of HS 6-digit product-country combinations subject to China's AD measures by the targeted exporting economy.[15] Japan and South Korea together account for approximately 40% of China's annual stock of product-country combinations affected by AD measures. On average, 64-71% of China's stock of AD measures were targeted towards developed countries each year during 2003-8. While the stock of products subject to China's AD measures fell for both developed and developing trading partners in 2009, the decline was much greater for AD measures targeting developing countries.

The leading target countries are also among the major sources of China's imports. Figure 2b shows the trend in the value of imports for China's leading trade partners. Imports from the EU, Japan, South Korea and USA together accounted for between 53-60% of China's total non-oil imports in each year during 1997-2009. During this period, imports from South Korea and the EU increased at an average annual rate of 16% and 15%, respectively, whereas imports from Japan and USA grew at an annual rate of 11% and 12%, respectively.

While the top five economies targeted by China are developed economies, China has also frequently targeted developing economies such as India, Indonesia, Malaysia, Thailand, and Russia.[16] Although a much smaller share of China's imports during 1997-2009 were from developing countries, imports from developing countries grew at a faster rate (17.5%) than imports from developed economies (13%).

Figure 4b focuses on the share of China's imports subject to AD measures using the *value* measure. The figure relies on separately constructed measures for developed and developing trading partners using the stock and flow indicators based on equation (2) of Bown (2011).[17] The pattern in

[15] Figure 4a uses a slightly modified version of the count measure where we only use the numerator of equation (1) of Bown (2011). Moreover, following Bown (2010a), we construct the measure using the count of combinations of HS 6-digit products and the target economy.

[16] We refer to all high income countries according to the World Bank definition based on GNI per capita as developed economies and the rest as developing economies.

[17] The denominator in each case refers to the imports from that group only. Therefore, if China imported very little from

China's flow of AD investigations is similar for both groups of countries; a large share of China's imports were affected by new AD investigations during 2002, followed by a gradual decline until 2007, with a reversal in trend during the crisis years. Despite the similarity in the pattern across both groups, the shares of imports affected by new AD investigations are very different. For instance, in 2009, 1.2% of China's imports from developed economies were subject to new AD investigations—almost as high as its within-period peak of 1.4% in 2002. On the other hand, roughly 0.4% of imports from developing countries were affected by new AD investigations in 2009, which was only one-fourth as much as the within-period peak of 1.6% in 2002. Thus, the flow of China's AD investigations during 2008-9 against developing countries was much smaller than the new cases against developed economies. Second, even within the set of developing country targets, the share of imports affected by new Chinese AD investigations during the crisis was much smaller than previous years.

Between 1997 and 2003, the total stock of Chinese imports subject to AD measures increased steadily, eventually affecting 1.8% of China's imports from developing countries and 2.2% of China's imports from developed countries. However, the two groups of countries show very different trends since 2003. While China's total stock of imports from developed economies subject to AD measures continued to increase until 2007, there was a dramatic decrease in its stock of imports from developing countries subject to AD measures.

4.2 Countries: sectoral composition of AD

Tables 3a and 3b explore potential sectoral differences in China's imports affected by AD depending on whether the targets were developed or developing economies. Table 3a examines the pre-crisis period (1997-2007) and Table 3b refers to 2008-9.

First consider Table 3a. China has only targeted imports from developed countries in the textiles sector; whereas in each of the other leading AD sectors (chemicals, paper and pulp, plastics and rubber, and steel), China targeted imports from both groups of countries. Moreover, in each sector in which China has used AD, the products involved in the AD investigations form a much lower share of imports from developing trading partners than the share of imports from developed trading partners. For example, while 6.6% of the imported products from developed economies in the paper and pulp sector were involved in AD investigations, only 3.3% of paper and pulp products imported from developing countries were involved.

Two striking features arise when comparing the pre-crisis period to 2008-9. First, China

developing countries but all of its imports were subject to AD measures, the import share affected by AD would be 100%.

initiated several new AD investigations against developed economies in sectors that had not previously participated in AD investigations prior to the crisis. For the developing economy targets, the entire increase during 2008-9 was due to increased product coverage in some of the traditional AD-using sectors. Second, the products involved in AD investigations in new sectors accounted for a much larger share of the value of imports. In the pre-crisis period, the largest share of imports for products involved in AD investigations accounted for only 14% of imports (plastics and rubber). During 2008-9, 35% of imports in the transport equipment sector became subject to China's AD investigations, all of this associated with the autos case.

5 Tariffs, AD duties and the duration of AD measures

5.1 China's AD duties

This section examines the magnitude of China's AD duties and explores whether China's AD has become more or less prohibitive over time. One of the features of AD is that it can be used to discriminate between different countries as well as between firms from the same target country. We focus on the ad valorem AD duty rates in Bown (2010b) which reports the *minimum* and *maximum* firm-specific duties. We use these minimum and maximum rates to construct averages. Figure 5a reports the average over all HS 6-digit products subject to an AD measure imposed that year across all targeted countries.[18] The solid line in the figure is the average of the maximum ad valorem rate for a given product across all targeted countries, and the dashed line depicts the average of the corresponding minimum rate. Our first result is that China's average ad valorem AD duty fell over the sample. At the end of 2009, the maximum rate for products with new AD measures was only 20%, which was sharply lower than 70% in 1999 when China first imposed an AD duty. This trend is particularly evident in the five years following the 2004 peak of the average rate.

Figure 5b reports the average maximum and minimum rates for the stock of products with an AD duty in place that year.[19] The average AD duty rate decreased over the sample period because the addition of new AD measures had lower average ad valorem AD rates than the measures being removed. Nevertheless, the maximum ad valorem AD duty was 60% even as late as 2009. Average AD

[18] Figure 5 reports the average ad valorem rates based on HS 6-digit product-country combinations, whereas Table 1 reports average ad valorem AD duties at the AD case level. Figure 5 takes the average over all products in which the duty was *imposed* in that year, whereas Table 1 takes the average over all cases *initiated* in that year.

[19] In later years, the AD duty faced by a given firm could be higher or lower than the duty originally imposed because of *administrative* or *interim reviews*. However, constructing a measure based on data collected from interim reviews is beyond the scope of this study. Hence, for simplicity, we assume that the size of the AD duty rate remained unchanged over the duration of the measure.

duties did not decrease at a faster rate despite the removal of previously-imposed measures in 2008-9 because the measures being eliminated had lower ad valorem rates.

5.2 The relationship between average tariff rates and AD

There are a number of potential theories of the relationship between tariffs and AD. Sectors with more political power may be successful in both getting an AD measure imposed and lobbying for tariff protection in the first place. Alternatively, the prospect that protection through AD might act as an 'escape valve' for tariff liberalisation (Bagwell and Staiger, 1990; Hoekman and Kostecki, 2001) suggests a positive relationship between the extent of tariff liberalisation and subsequent AD use.[20]

While we do not attempt a systematic exploration of these competing hypotheses, we explore potential differences between the average applied tariff rates for products that were involved in AD investigations in China in comparison to products that were not. Figure 6 illustrates average tariffs for both groups of products during 1999-2009. The dashed line in the figure refers to the average applied MFN tariff rates for all HS 6-digit products involved in an AD investigation at any point during the period after China's WTO accession (2002-9). The solid line represents the average applied MFN tariff rates for all other HS 6-digit products that were never involved in Chinese AD investigations. The first graph in Figure 6 refers to all imported products; the other graphs report the same analysis for China's five leading AD sectors - chemicals, paper and pulp, plastics and rubber, steel, and textiles.[21]

The figure suggests a similar trend in the average tariff across all of China's leading AD users. China's average applied tariff decreased significantly during 2001-3 for both groups of products - those involved in AD investigations at any point during 2002-9 and those that were not. Furthermore, for many of the leading sectors, the average tariff for products that were subsequently involved in an AD investigation decreased at a faster rate and experienced a larger cut in absolute terms.[22] The larger decrease in absolute terms is noteworthy considering that even prior to China's WTO accession the average tariff for products subsequently involved in AD investigations was lower than the average tariff for other products. This suggests that products that experienced a larger tariff reduction during China's WTO accession were more likely to be involved in an AD investigation subsequently.

[20] See Bown and Tovar (2011) for evidence of this relationship in the case of India.

[21] We use data on China's applied MFN ad valorem tariff at the HS 6-digit level from TRAINS through WITS. There is no tariff data for China for 2002.

[22] The only exceptions to this were plastics and rubber and steel in which average tariffs decreased at a similar rate. The average tariff in the steel sector decreased from 9.6% in 2000 to 7.9% in 2003 for the products that were never investigated with AD, and the average tariff for the products involved in AD decreased from 8.5% in 2001 to 6.9% in 2003—a decrease of 18% in each case. Similarly, the average tariffs for the plastics and rubber sector decreased by 33% and 36% during 2001-3, for products that were in subsequent AD investigations and those that were not, respectively.

5.3 The duration of China's AD measures

According to WTO rules, members are required to conduct *sunset reviews* of all AD orders at the end of five years to determine whether the AD measure is still necessary. While WTO rules call for a mandatory sunset review, the members can extend the duration of the AD measure if they find a likely recurrence of dumping and injury.

As noted in Table 1, 135 of the 166 AD cases that China investigated during 1997-2009 resulted in imposition of an AD measure.[23] Of these 135 measures, 105 (78%) were still 'in force' through 2009—*ie* China removed only 30 AD measures during 1999-2009. China removed 20 of these 30 AD measures during the 2008-9 crisis. On one hand, it is not surprising that China removed so many AD measures during the crisis given that a large number of cases had been imposed in 2002-3; *ie* many cases were scheduled for a sunset review in 2008. Nevertheless, this is not meant to suggest that China is successful at removing its AD measures 'on time', *ie* after 5 years. In 2008-9, China removed only 11 of the 34 (32%) AD measures imposed during 2002-3.

Figure 7a shows the duration (in years) of all Chinese AD measures imposed during 1997-2009 categorised by whether the AD measure has been removed. First focus on the AD measures that have been removed by 2009. Of the 30 removed measures, 15 (50%) were removed after five years. Adding the number of measures that were removed in fourth and sixth years, and given that we are using annual figures rather than the exact date at which the AD measure was imposed or removed, this number increases to 22 cases (73%).[24] Thus, a large share of AD measures that *have been* removed were removed around the sunset review period of five years. However, if we include the measures that have not yet been removed through 2009, a very different picture emerges. Many Chinese AD measures that are in force as of 2009 were imposed more than five years earlier.

Figures 7b and 7c focus on the Chinese AD measures that were imposed prior to 2005 and which already completed the five-year period required for the initial sunset review. Figure 7b shows the number of AD measures based on whether they have been removed, further subdividing the removed cases according to whether they were removed at, before, or after the expected five-year term. With the exception of 1999, a large share of the measures imposed *before* China's accession to the WTO have been removed on time. However, this is not the case for AD measures that China imposed *after* it entered the WTO.

[23] Six additional AD investigations in 2009 are still ongoing.

[24] The sunset review investigations could also last for several months, thus the measures removed in six years were presumably removed after the completion of the sunset review.

Figure 7c provides data by year that examines the percentage of AD measures imposed more than five years earlier that have been removed. Between 2005 and 2009, the share of AD measures that were not removed but that were imposed five or more years earlier varied between 40% to 60%. The exception is 2004, when none of the three AD measures (originally imposed in 1999) were removed. Figure 7c also shows that the share of AD measures not removed on time increased slightly during the crisis.

6 The participation of Chinese firms in AD cases as petitioners

According to China's antidumping regulations, the government can initiate an AD investigation after a petition is submitted by or on behalf of the domestic industry. While the concerned government authority (MOFCOM) could also self-initiate a petition, a group of firms representing the industry has initiated almost all of the AD cases in China through 2009.[25]

We pause at this stage to make three clarifications. First, AD petitions filed against the imports of a given product may be directed towards more than one country. Thus, here we refer to each product-country combination as a separate AD case. Second, there are nine instances during 1997-2009 in which an industry association (and not individual firms) filed the AD petition. We drop these cases from our analysis since the number of firms within the association that support the petition is unknown.[26] Third, on occasion, subsidiaries of the same corporation participate in filing the petition. For example, in 2007 China initiated an AD investigation on imports of acetone from Japan, South Korea, Singapore and Taiwan. Two of the petitioners were *Beijing Yanshan Branch Sinopec* and *Shanghai Gaoqiao Branch Sinopec*. In our analysis, we treat these as two distinct firms even though both are subsidiaries of the same corporation. We justify this under the assumption that subsidiaries of the same corporation may engage in very different operations.

During 1997-2009, only 141 Chinese firms participated in the AD proceedings as petitioners. Furthermore, the average number of firms involved in a given AD case is also very small. Figure 8a shows the distribution of Chinese firms involved in an AD case as petitioners during 1997-2009. Three or fewer petitioning firms were involved in 128 of the 163 AD cases (80%). While 14 firms were listed

[25] According to Chinese AD regulations, the domestic industry constitutes the firms producing *like* products. In addition, for the government authority to initiate the AD case, the AD petition should be supported by a majority of the industry—*ie* firms representing at least 50% of the output (Wang and Yu, 2002).

[26] Through 2009, only five 'associations' were petitioners in AD investigations: China's Industrial Association of Mechanical General Parts, China Methanol Association, China Animal Agricultural Association, China Association of Automobile Manufacturers, and Chemical Fiber Industry Association of China. Together, these five associations accounted for nine separate AD cases.

as petitioners in one case, 37 AD cases (23%) listed only one petitioning firm.

Table 4a shows the average number of firms participating as petitioners for each year during 1997-2009. There is little difference in how many firms participated in an AD investigation before and during the 2008-9 crisis. Except for 1997, the average number of petitioners varied between two and four until 2007. Though the AD cases filed during 2008 had relatively fewer firms listed as petitioners, it increased again in 2009.

We explore next the average number of AD cases in which each firm participates. Figure 8b reports that the modal number of AD cases in which a firm participates is three, with more than 50 firms participating in three AD cases during 1997-2009. One firm, *Jilin Chemical Co. Ltd.*, was involved in 14 separate AD cases and was listed as a petitioner in four separate AD petitions during 1997-2009 (Table 4b). Of the 141 firms that have participated in Chinese AD investigations, 128 (91%) were involved in only one AD petition each through 2009.

Even though a number of firms participated in multiple AD cases, Figure 8b shows that of the 141 firms, 29 (21%) participated in just one AD case. These firms were involved in AD petitions that targeted imports from only one trading partner.

7 Conclusions

This paper examines the underlying trends in China's use of a particular set of non-tariff barriers - collectively temporary trade barriers (TTBs). We focus on historical patterns in China's use of TTBs and examine whether this pattern changed during the 2008-9 crisis. The share of China's imports subject to TTB measures during 2008-9 was not much different from previous years, and in fact had declined compared to 2007. Nevertheless, a more detailed exploration of the data reveals a number of potential changes to this trend.

Although China's total stock of imports subject to AD measures decreased during the crisis, China initiated a number of new investigations. This increase in new AD investigations was a reversal of the existing pattern, as the flow of China's AD investigations had generally been decreasing since 2003. Furthermore, a number of Chinese antidumping investigations over sizeable amounts of imports are still pending. Finally, another notable feature of 2008-9 was the new industries for which China initiated an AD investigation for the first time—including transport equipment and animal products.

Furthermore, though China removed a number of AD measures during the crisis period, there were many cases in which the duration of previously-imposed AD measures surpassed five years

without removal. Turning temporary trade barriers into quasi-permanent protection is potentially troubling.

Our analysis also revealed a number of other interesting patterns in China's use of TTBs. We find that during 1997-2009 a much larger share of China's TTBs targeted developed countries than developing countries. Even at its peak, only 1.5% of China's total imports from developing countries were subject to AD measures; much lower than the respective within-period peak of 2.5% for the developed countries. Moreover, during the crisis, China's stock of imports subject to AD measures decreased at a much faster rate for developing countries as compared to developed countries. This stands in contrast to many other developing countries in which the pattern of AD has increasingly become more 'South-South'.

We also explore participation by Chinese firms as petitioners in the AD proceedings and find it to be surprisingly small. Only 141 Chinese firms were involved in AD activities as petitioners during 1997-2009, and 128 (91%) of these firms have filed only one petition. In a large number of AD cases, the AD petitions were filed by only one Chinese firm.

We conclude with one final caveat. While this paper focused on instruments of contingent protection - AD, CVD and SG - these TTBs are not the only instruments of import protection. During the crisis, many countries, including China, resorted to protectionism through indirect and often disguised means such as bailouts, local content requirements, and subsidies (Global Trade Alert, 2009). For instance, in June 2009, the Chinese government made more stringent '*buy Chinese*' provisions in its new stimulus program. Similarly, in May 2009, China's National Development and Reform Commission and a number of Chinese Ministries signed a notification to give priority to the local content in government contracts. A more complete picture of the policy responses during the crisis would thus require accounting for many other instruments of protectionism beyond TTBs.

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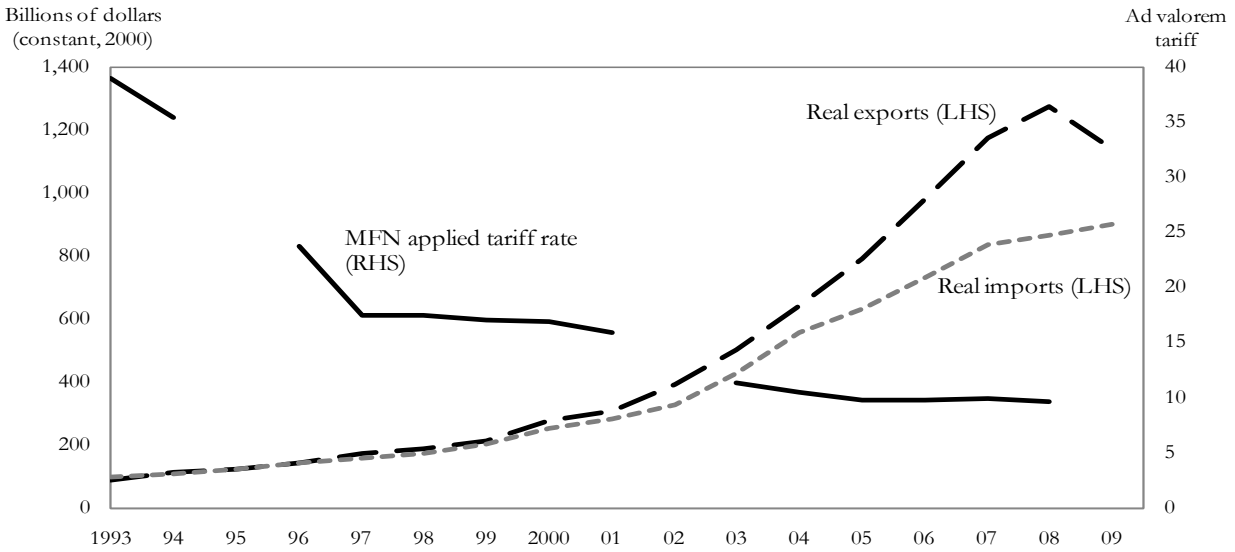
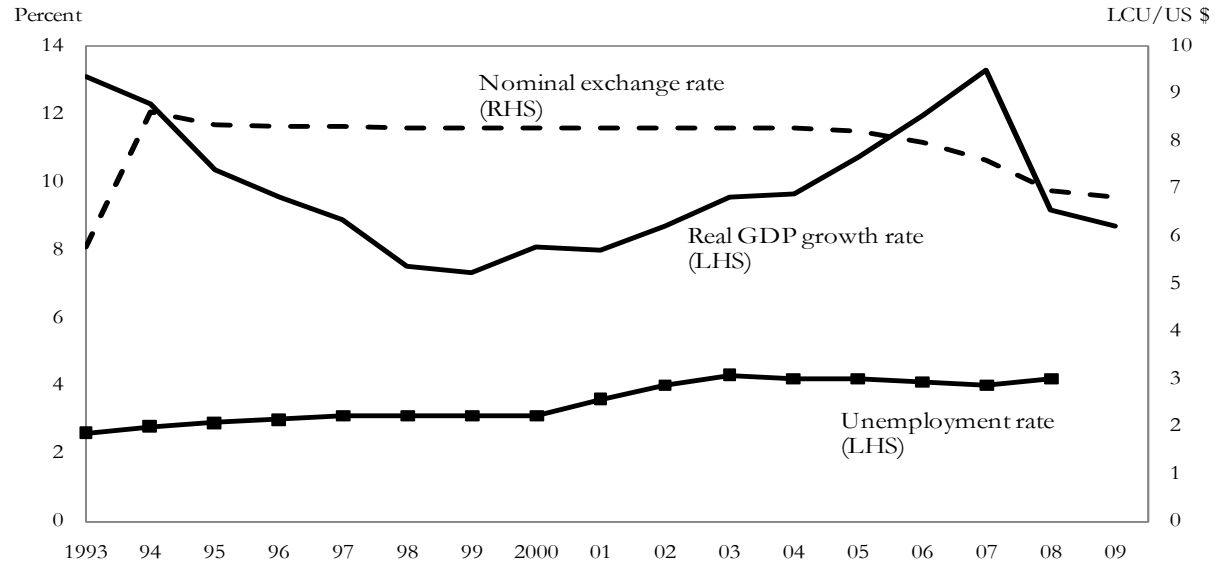
a. Exports, imports and average tariffs



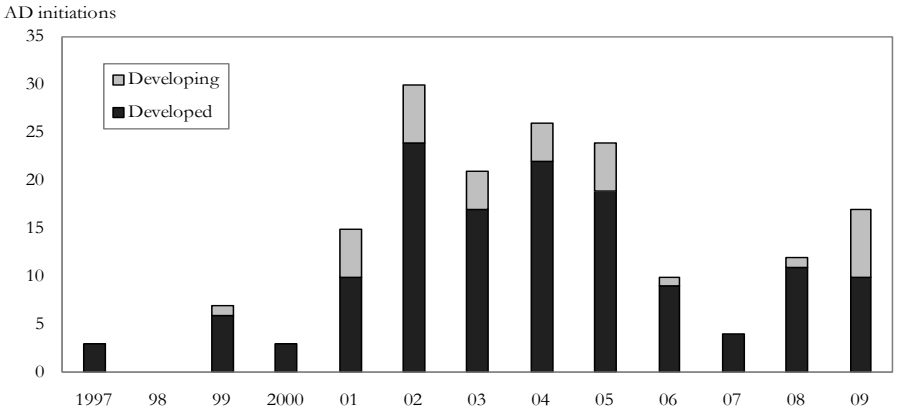
b. Growth rate of GDP, exchange rate and unemployment rate



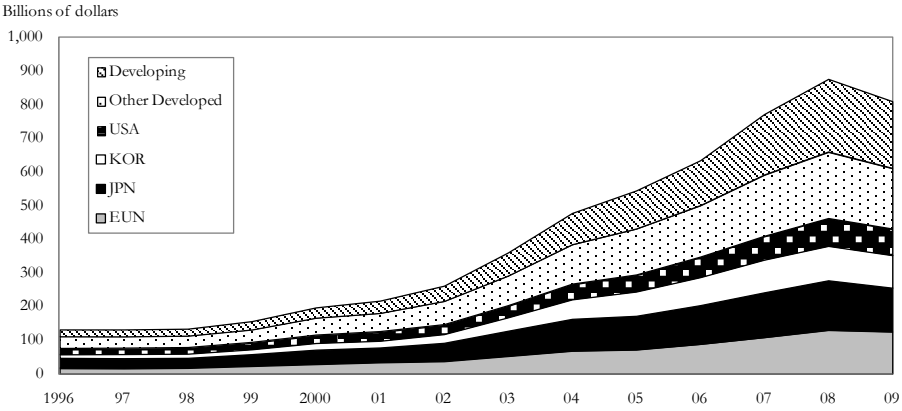
Notes: In Panel a, the ad valorem tariff rate is defined as a simple average of applied MFN tariffs for all products. In Panel b, the exchange rate is the period average official exchange rate defined as yuan/$. The unemployment rate is a percentage of total employment.
Source: Author's calculations using the World Development Indicators (2010).

Figure 1: Macroeconomic Conditions in China, 1993-2009

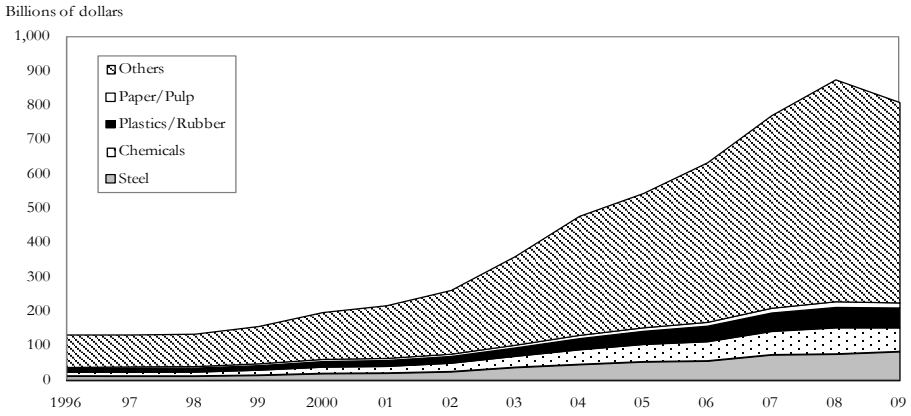
a. China's antidumping investigations



b. China's total import value by major trading partners



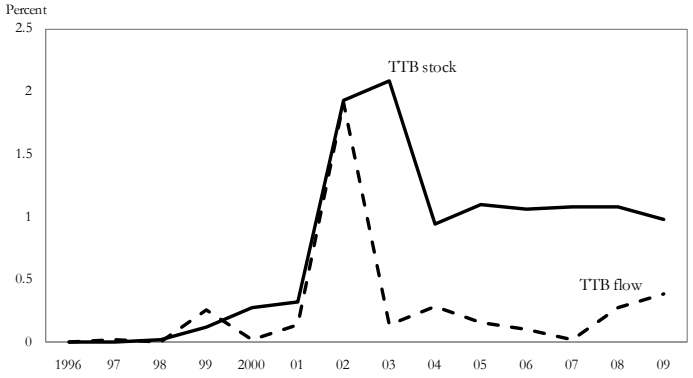
c. China's total import value by main sectors involved in AD



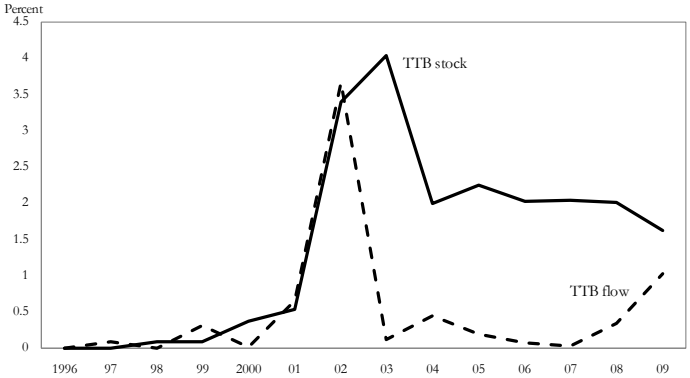
Notes: The European Union is treated throughout as the set of 27 member countries. An AD case refers to the product-country pair from a given AD petition. Imports refer to China's non-oil imports.
Source: Author's calculations using data from Bown (2010b) and COMTRADE.

Figure 2: China's AD Investigations and Aggregate Imports, 1997-2009

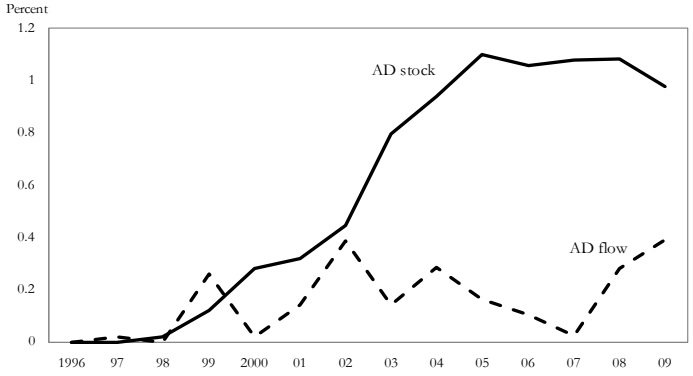
(i) All TTBs - count



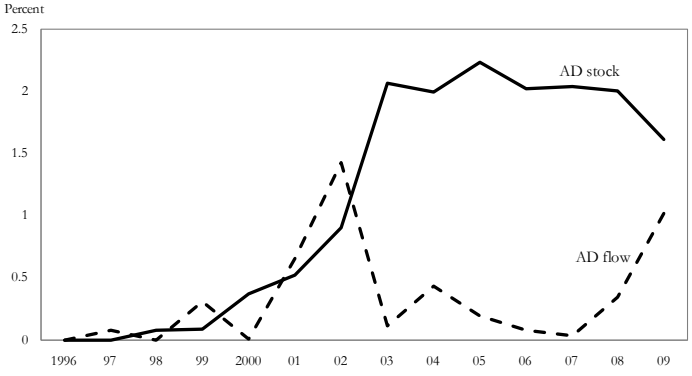
(ii) All TTBs - value



(iii) AD only - count

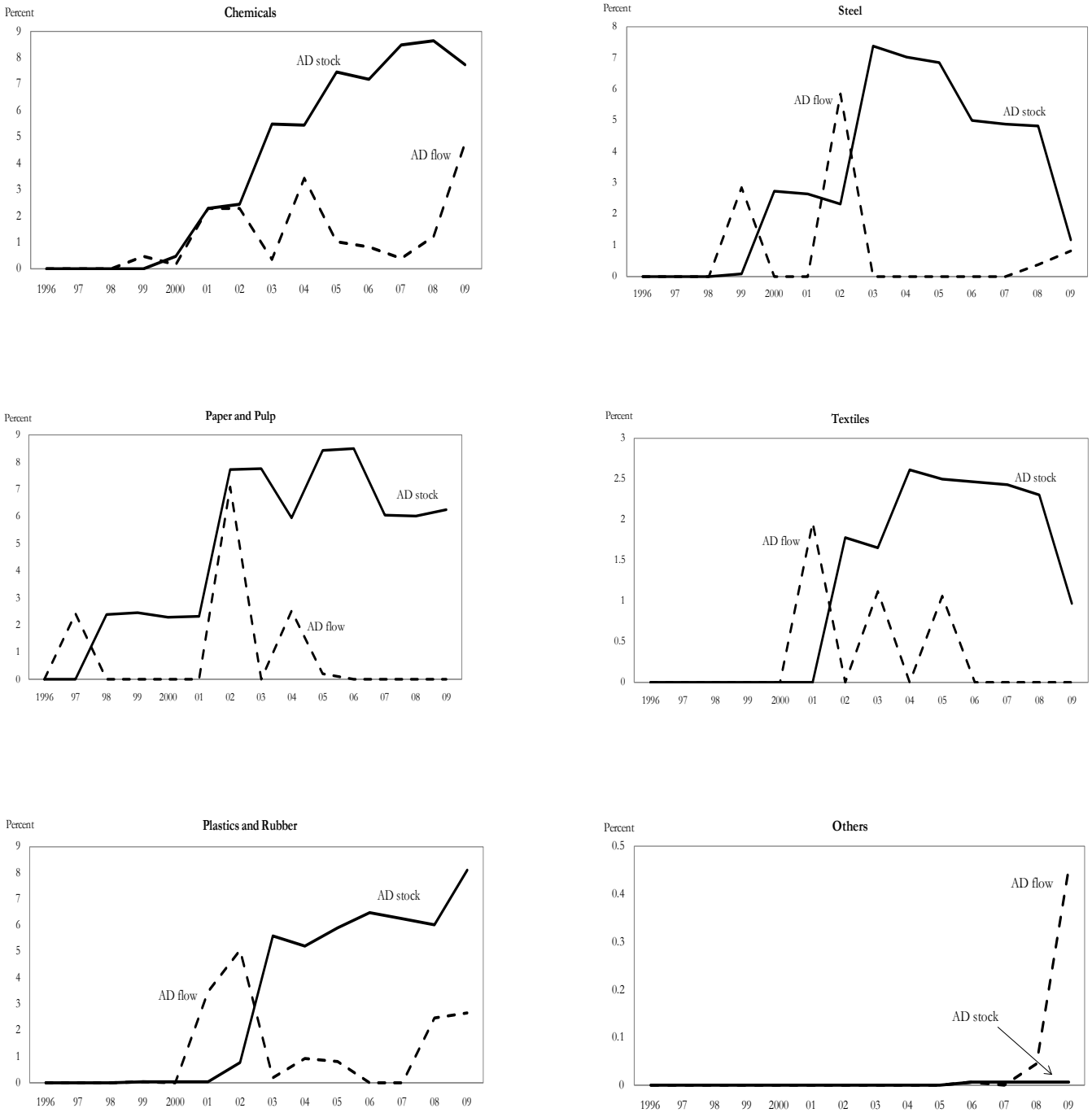


(iv) AD only - value



Notes: The measures are based on equation (1) and equation (2) from Bown (2011). The count measures report the percentage of HS-06 digit products affected by the relevant barrier. The value measures report the share of the imports affected by the corresponding measure. The *stock* measure corresponds to all measures currently in force (even if preliminary) and the *flow* measure corresponds to all new initiations. The top panel refers to all TTBs, which include AD, CVD as well as SG measures, whereas the bottom panel refers to AD only.
Source: Author's calculations using data from Bown (2010b) and COMTRADE.

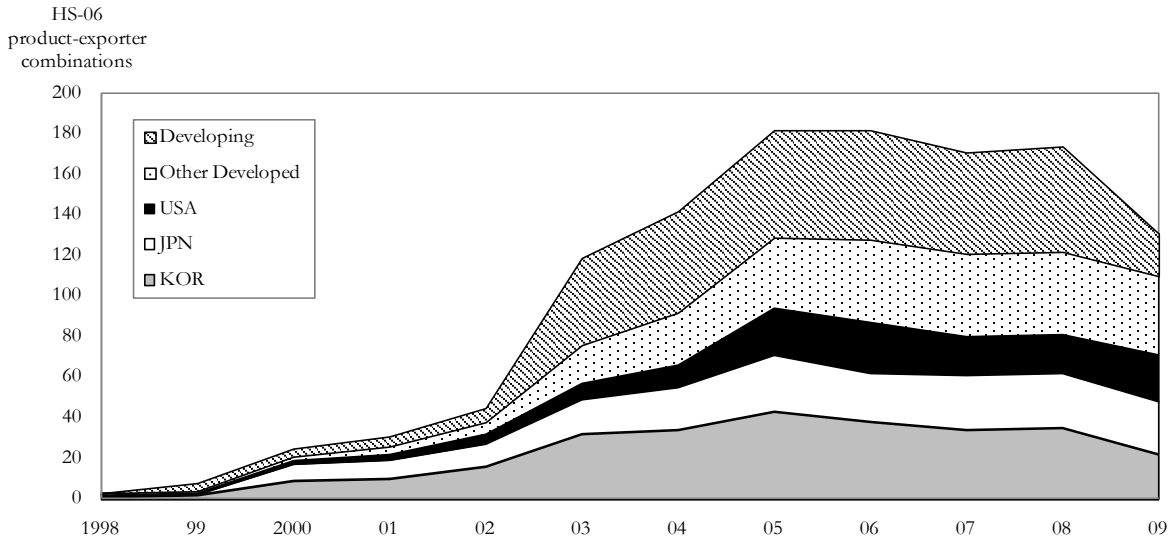
Figure 3a: China's TTB-Affected Imports using Count and Value Measures, 1997-2009



Notes: These measures are based on equation (2) from Bown (2011). The figure shows the share of import value in each sector affected by AD.
Source: Author's calculations using data from Bown (2010b) and COMTRADE.

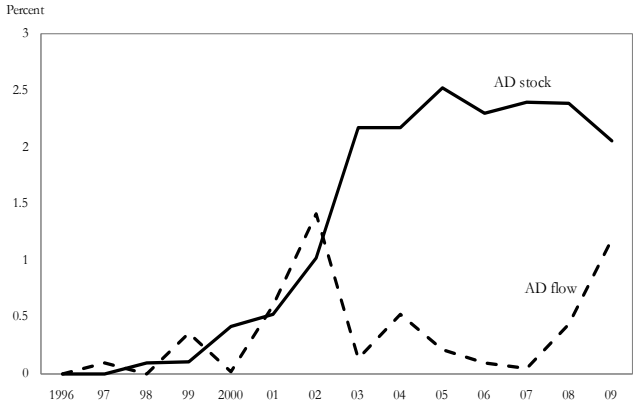
Figure 3b: Share of China's Imports Affected by AD by Sector, 1997-2009

a. Stock of products affected by AD measure, by trading partner

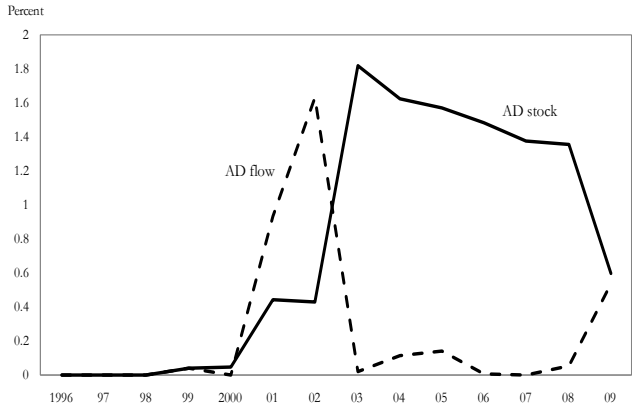


b. Share of imports affected by AD, by income group of trading partner

(i) From developed



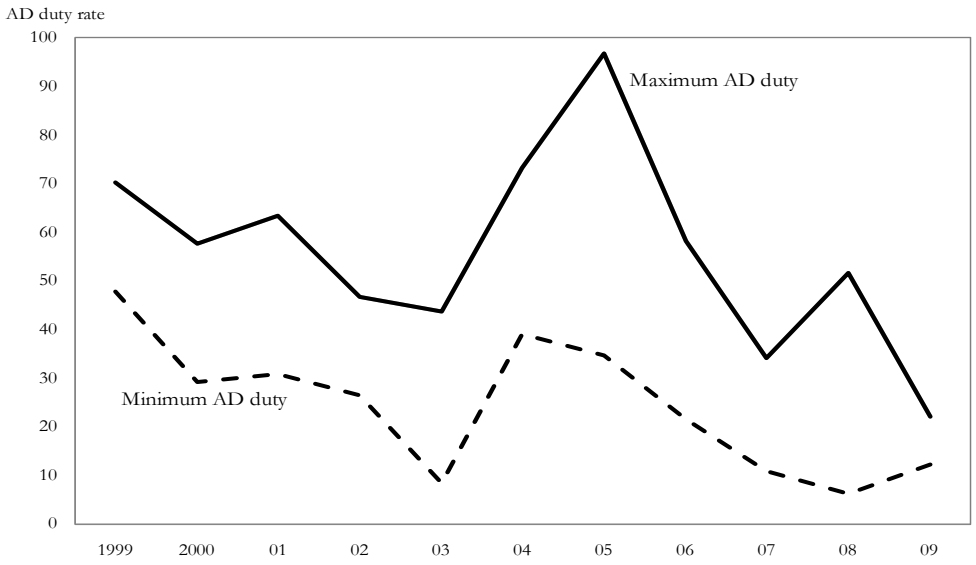
(ii) From developing



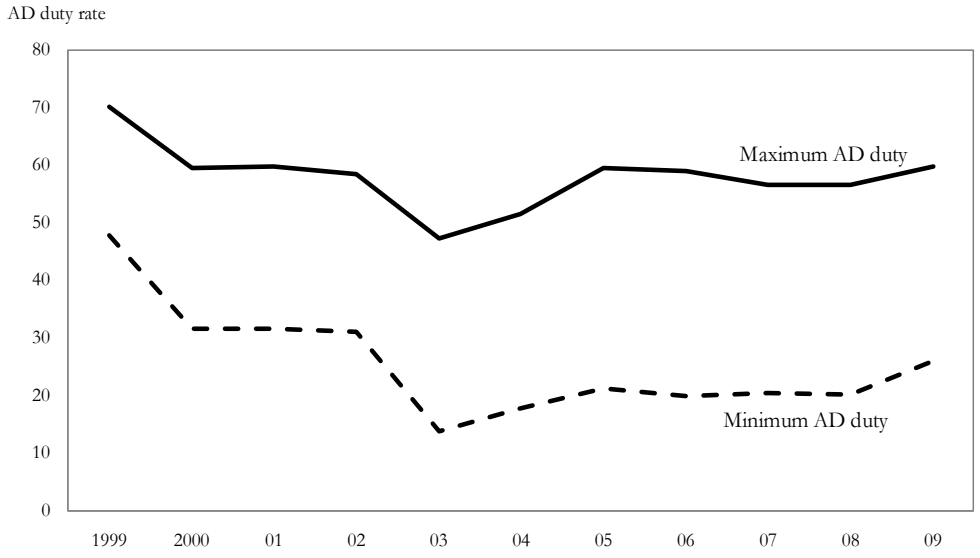
Notes: The measures in Panel a are based on a slightly modified version of equation (1) from Bown (2011) in which we drop the denominator. The measures illustrate the annual stock of product-exporting country target combinations affected by AD measures. The measures in Panel b are based on equation (2) from Bown (2011).
Source: Author's calculations using data from Bown (2010b) and COMTRADE.

Figure 4: China's Imports Affected by AD, by Targeted Trading Partner, 1997-2009

a. Products with new AD measures only (flow)

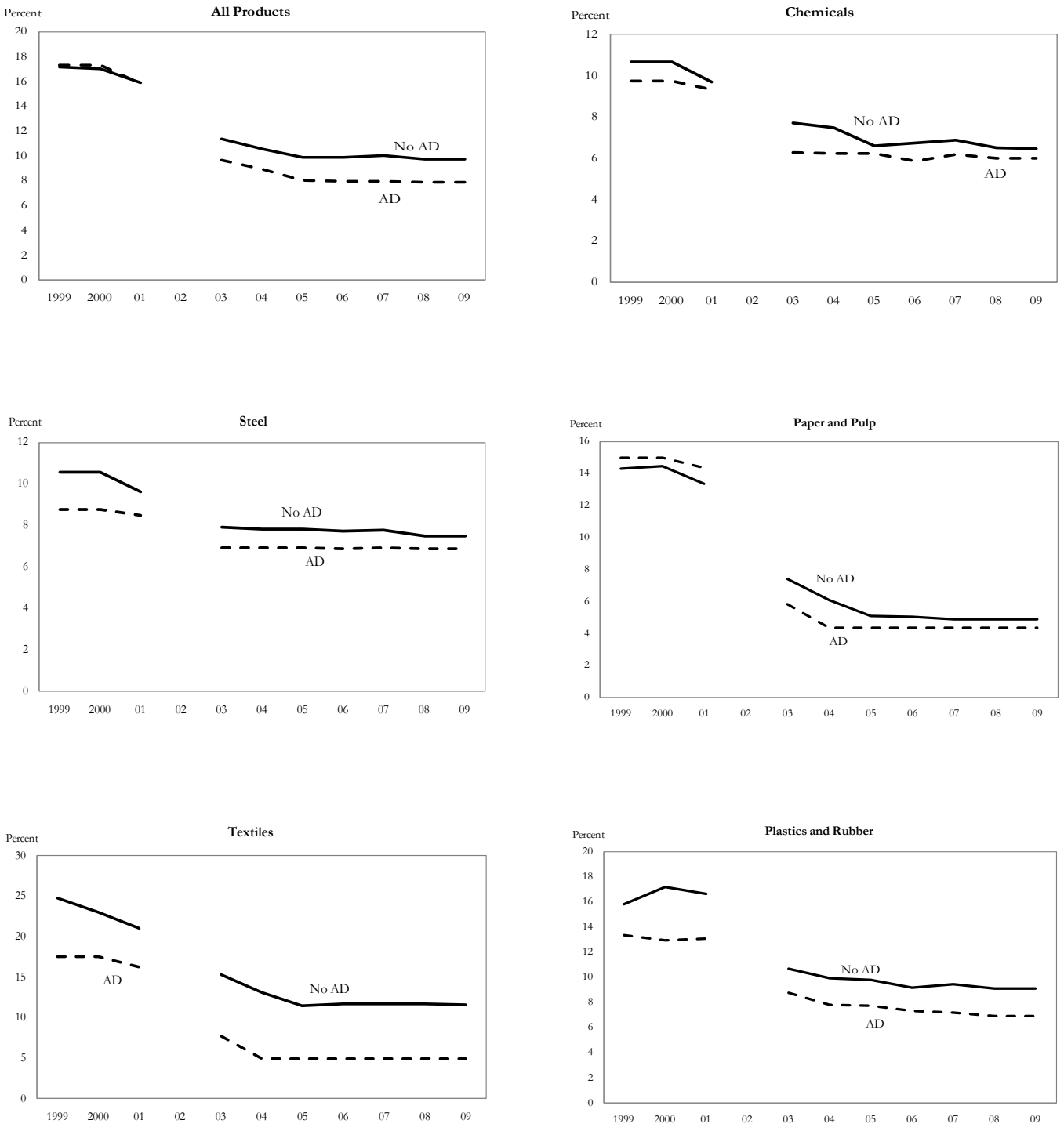


b. All products with a final AD measure in force (stock)



Notes: Panel a reports the average ad valorem duty rate for all new measures conditional on a final AD measure being imposed. Panel b reports the same measure for all products that have a final AD measure in place.
Source: Author's calculations using data from Bown (2010b).

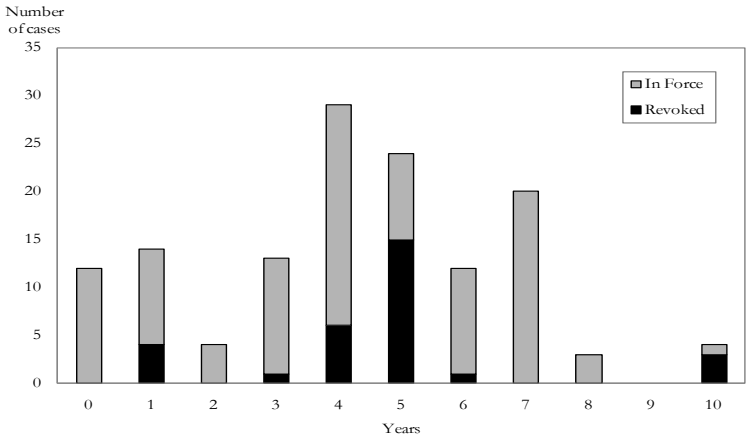
Figure 5: China's Average AD Duties Conditional on a Final AD Measure Imposed



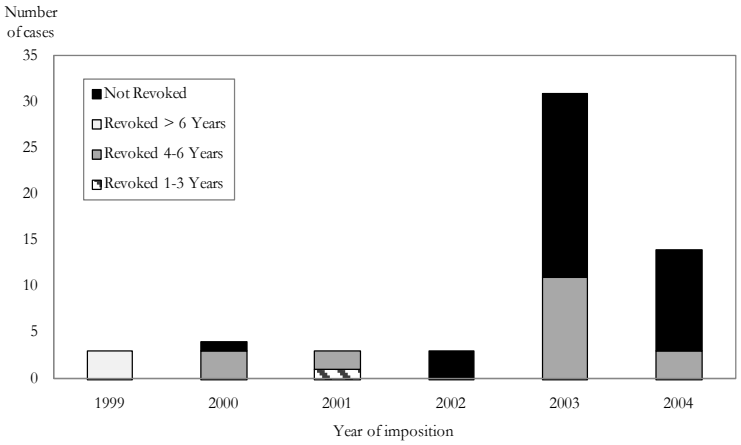
Notes: Applied tariff rates are simple averages with data from TRAINS at the HS 6-digit level. Products are classified as AD if they were involved in an AD investigation in China at any time during 2002-9, *ie* the period after China's WTO accession.
Source: Author's calculations using data from Bown (2010b) and TRAINS using WITS.

Figure 6: China's Average Applied Tariffs for Products Affected by AD - Overall and by Sector, 1997-2009

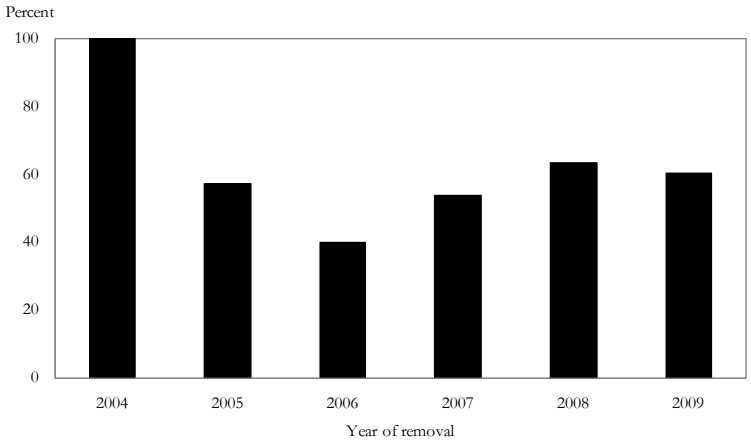
a. All AD cases conditional on a final AD measure being imposed, 1999-2009



b. All AD cases conditional on a final AD measure being imposed, 1999-2004



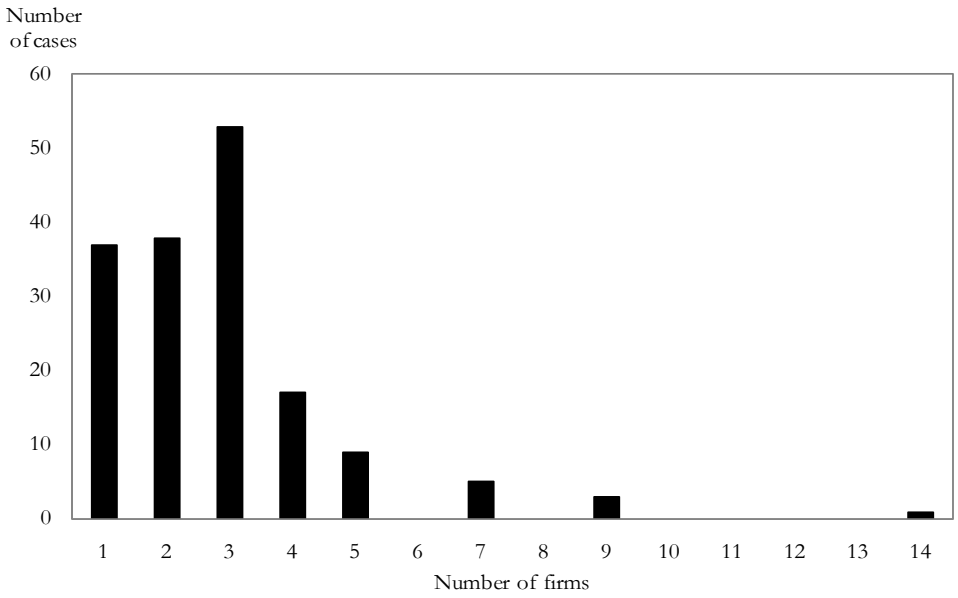
c. Percentage of AD measures imposed five or more years earlier that have not been removed



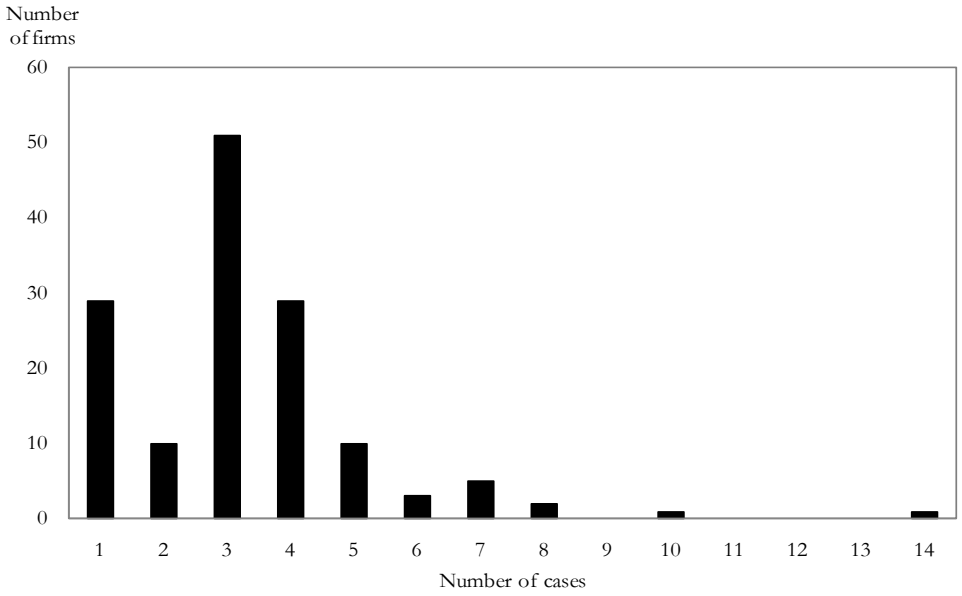
Source: Author's calculations using data from Bown (2010b).

Figure 7: Duration of China's AD Measures

a. Chinese firms involved in an AD case as petitioners



b. AD cases filed by petitioning Chinese firms



Notes: Each unique petitioner identified separately in the AD petition is defined as a separate firm even if they are subsidiaries of a single corporation. We exclude cases where the petition was filed by an industry association. Each AD case is defined as a separate product-country AD investigation.
Source: Author's calculations using data from Bown (2010b).

Figure 8: Chinese AD Petitioning Firms, 1997-2009

Table 1: China's AD Initiations and Outcomes - Overall and by Income Group, 1997-2009

	All cases				Developed countries				Developing countries			
Year	Number of AD Initiations	Number of cases that resulted in final AD measures (%)	Average minimum ad valorem AD duty	Average maximum ad valorem AD duty	Number of AD Initiations	Number of cases that resulted in final AD measures (%)	Average minimum ad valorem AD duty	Average maximum ad valorem AD duty	Number of AD Initiations	Number of cases that resulted in final AD measures (%)	Average minimum ad valorem AD duty	Average maximum ad valorem AD duty
1997	3	3 (100)	48.0	70.3	3	3 (100)	48.0	70.3	0	0 -	-	-
1998	0	0 -	-	-	0	0 -	-	-	0	0 -	-	-
1999	7	7 (100)	25.8	58.3	6	6 (100)	29.8	57.6	1	1 (100)	6.0	62.0
2000	3	3 (100)	26.7	46.7	3	3 (100)	26.7	46.7	0	0 -	-	-
2001	15	9 (60)	8.6	32.1	10	6 (66)	9.2	35.2	5	3 (60)	7.3	26.0
2002	30	26 (86)	11.6	47.1	24	20 (83)	10.5	50.0	6	6 (100)	15.2	37.3
2003	21	20 (95)	63.5	105.5	17	16 (94)	66.6	114.6	4	4 (100)	51.3	69.0
2004	26	18 (69)	32.5	83.8	22	15 (68)	37.5	80.8	4	3 (75)	7.2	98.6
2005	24	13 (54)	13.8	42.7	19	12 (63)	14.0	44.6	5	1 (20)	12.2	20.4
2006	10	10 (100)	11.6	37.0	9	9 (100)	11.8	37.0	1	1 (100)	10.1	37.7
2007	4	4 (100)	6.3	51.6	4	4 (100)	6.3	51.6	0	0 -	-	-
2008	12	11 (91)	12.4	22.6	11	10 (90)	13.1	22.6	1	1 (100)	5.4	21.8
2009*	11	11 (100)	11.9	39.4	6	6 (100)	16.9	51.0	5	5 (100)	5.9	25.5
Total	166	135 (81)	22.7	55.9	134	110 (82)	24.4	58.7	32	25 (78)	15.0	46.5

Notes: *The table does not include the six additional AD cases initiated in 2009 that are still ongoing.
Source: Author's calculations using data from Bown (2010b).

Table 2: Sectoral Distribution of AD cases in China

a. 1997-2009

	HS Section	Number of HS six digit products with non-zero imports	Share of HS six digit products within sector involved in AD investigations	Share of HS six digit products within sector subject to AD measure	Share of 1997-2009 imports within sector in HS six digit products subject to AD measure	Sectoral Imports as a share of total imports (1997-2009)	Share of 1996 imports within sector in HS six digit products subject to AD measure	Sectoral Imports as a share of total 1996 imports
I	Live animals, and animal products	198	2.5	0.0	0.0	0.8	0.0	0.7
II	Vegetable products	269	0.4	0.4	0.1	2.3	0.2	2.6
III	Animal or vegetable fats, oils, and waxes	46	0.0	0.0	0.0	0.9	0.0	1.3
IV	Prepared foodstuffs, beverages, and tobacco	186	0.0	0.0	0.0	0.7	0.0	1.8
V	Mineral products	146	0.0	0.0	0.0	7.2	0.0	2.6
VI	Chemicals	786	3.7	3.1	12.1	8.8	9.9	7.9
VII	Plastics and rubber	198	5.1	4.5	12.0	7.1	10.3	7.7
VIII	Leather products	74	0.0	0.0	0.0	1.0	0.0	1.9
IX	Wood and bamboo products	81	0.0	0.0	0.0	1.1	0.0	1.2
X	Paper and pulp	151	6.6	6.6	9.7	2.2	18.6	3.2
XI	Textiles	822	0.7	0.7	4.7	4.2	3.9	12.6
XII	Footwear and umbrellas	55	0.0	0.0	0.0	0.1	0.0	0.3
XIII	Articles of stone, plaster, cement	147	0.0	0.0	0.0	0.6	0.0	0.8
XIV	Precious stones and metals	50	0.0	0.0	0.0	0.7	0.0	0.3
XV	Steel	571	4.7	4.7	13.3	9.7	18.2	9.6
XVI	Machinery and electrical	804	0.0	0.0	0.0	40.7	0.0	37.1
XVII	Transport equipment	132	3.8	0.0	0.0	4.5	0.0	4.0
XVIII	Other instruments	238	1.7	0.0	0.0	7.0	0.0	3.5
XIX	Arms and ammunition	14	0.0	0.0	0.0	0.0	0.0	0.0
XX	Miscellaneous manufactured articles	130	0.0	0.0	0.0	0.4	0.0	0.8
XXI	Works of art	7	0.0	0.0	0.0	0.0	0.0	0.0
	Total	5105	1.9	1.5	4.9	100.0	5.1	100.0

Source: Author's calculations using data from Bown (2010b) and COMTRADE.

b. Before and During the Crisis

		1997-2007			2008-2009		
	HS Section	Share of HS six digit products within sector involved in AD investigations	Share of HS six digit products within sector subject to AD measure	Share of 1997-2007 imports within sector in HS six digit products subject to AD measure	Share of HS six digit products within sector involved in AD investigations	Share of HS six digit products within sector subject to AD measure	Share of 2008-2009 imports within sector in HS six digit products subject to AD measure
I	Live animals, and animal products	0.0	0.0	0.0	3.1	0.0	0.0
II	Vegetable products	0.4	0.4	0.2	0.0	0.4	0.0
III	Animal or vegetable fats, oils, and waxes	0.0	0.0	0.0	0.0	0.0	0.0
IV	Prepared foodstuffs, beverages, and tobacco	0.0	0.0	0.0	0.0	0.0	0.0
V	Mineral products	0.0	0.0	0.0	0.0	0.0	0.0
VI	Chemicals	3.2	2.8	11.8	1.0	3.4	10.7
VII	Plastics and rubber	4.5	4.0	9.7	0.5	4.1	11.6
VIII	Leather products	0.0	0.0	0.0	0.0	0.0	0.0
IX	Wood and bamboo products	0.0	0.0	0.0	0.0	0.0	0.0
X	Paper and pulp	6.6	6.6	12.0	0.0	3.7	2.2
XI	Textiles	0.7	0.7	5.0	0.0	0.5	1.8
XII	Footwear and umbrellas	0.0	0.0	0.0	0.0	0.0	0.0
XIII	Articles of stone, plaster, cement	0.0	0.0	0.0	0.0	0.0	0.0
XIV	Precious stones and metals	0.0	0.0	0.0	0.0	0.0	0.0
XV	Steel	3.9	3.9	13.5	1.3	3.3	7.0
XVI	Machinery and electrical	0.0	0.0	0.0	0.0	0.0	0.0
XVII	Transport equipment	0.0	0.0	0.0	4.1	0.0	0.0
XVIII	Other instruments	0.0	0.0	0.0	1.9	0.0	0.0
XIX	Arms and ammunition	0.0	0.0	0.0	0.0	0.0	0.0
XX	Miscellaneous manufactured articles	0.0	0.0	0.0	0.0	0.0	0.0
XXI	Works of art	0.0	0.0	0.0	0.0	0.0	0.0
	Total	1.4	1.4	4.9	1.6	1.3	3.3

Source: Author's calculations using data from Bown (2010b) and COMTRADE.

Table 3: Sectoral Distribution of AD cases in China by Income Group

a. Prior to Crisis, 1997-2007

		Developed countries			Developing countries		
	HS Section	Share of HS six digit products within sector involved in AD investigations	Share of imports within sector in HS six digit products involved in AD investigations	Sectoral Imports as a share of total imports (%)	Share of HS six digit products within sector involved in AD investigations	Share of imports within sector in HS six digit products involved in AD investigations	Sectoral Imports as a share of total imports (%)
I	Live animals, and animal products	0.0	0.0	0.7	0.0	0.0	1.6
II	Vegetable products	0.4	0.4	1.1	0.0	0.0	5.2
III	Animal or vegetable fats, oils, and waxes	0.0	0.0	0.1	0.0	0.0	3.3
IV	Prepared foodstuffs, beverages, and tobacco	0.0	0.0	0.4	0.0	0.0	2.0
V	Mineral products	0.0	0.0	2.8	0.0	0.0	16.0
VI	Chemicals	3.1	12.7	9.4	1.8	12.7	6.5
VII	Plastics and rubber	4.5	14.4	7.5	1.5	10.1	6.0
VIII	Leather products	0.0	0.0	1.1	0.0	0.0	1.0
IX	Wood and bamboo products	0.0	0.0	0.4	0.0	0.0	4.7
X	Paper and pulp	6.6	13.1	2.2	3.3	3.2	3.0
XI	Textiles	0.7	5.2	5.3	0.0	0.0	3.8
XII	Footwear and umbrellas	0.0	0.0	0.1	0.0	0.0	0.1
XIII	Articles of stone, plaster, cement	0.0	0.0	0.7	0.0	0.0	0.3
XIV	Precious stones and metals	0.0	0.0	0.5	0.0	0.0	1.1
XV	Steel	3.2	11.0	9.3	2.6	11.8	11.5
XVI	Machinery and electrical	0.0	0.0	44.5	0.0	0.0	31.6
XVII	Transport equipment	0.0	0.0	5.1	0.0	0.0	1.1
XVIII	Other instruments	0.0	0.0	8.3	0.0	0.0	0.9
XIX	Arms and ammunition	0.0	0.0	0.0	0.0	0.0	0.0
XX	Miscellaneous manufactured articles	0.0	0.0	0.4	0.0	0.0	0.1
XXI	Works of art	0.0	0.0	0.0	0.0	0.0	0.0
	Total	1.3	5.0	100	0.7	3.8	100

Source: Author's calculations using data from Bown (2010b) and COMTRADE.

b. During Crisis, 2008-2009

		Developed countries			Developing countries		
	HS Section	Share of HS six digit products within sector involved in AD investigations	Share of imports within sector in HS six digit products involved in AD investigations	Sectoral Imports as a share of total imports (%)	Share of HS six digit products within sector involved in AD investigations	Share of imports within sector in HS six digit products involved in AD investigations	Sectoral Imports as a share of total imports (%)
I	Live animals, and animal products	3.1	19.6	0.8	0.0	0.0	1.1
II	Vegetable products	0.0	0.0	1.8	0.0	0.0	6.9
III	Animal or vegetable fats, oils, and waxes	0.0	0.0	0.1	0.0	0.0	4.0
IV	Prepared foodstuffs, beverages, and tobacco	0.0	0.0	0.5	0.0	0.0	1.4
V	Mineral products	0.0	0.0	6.0	0.0	0.0	27.7
VI	Chemicals	0.9	13.5	9.9	0.8	12.1	4.5
VII	Plastics and rubber	0.5	3.9	7.3	0.5	1.3	5.4
VIII	Leather products	0.0	0.0	0.7	0.0	0.0	0.8
IX	Wood and bamboo products	0.0	0.0	0.3	0.0	0.0	2.7
X	Paper and pulp	0.0	0.0	1.9	0.0	0.0	2.0
XI	Textiles	0.0	0.0	2.5	0.0	0.0	2.1
XII	Footwear and umbrellas	0.0	0.0	0.1	0.0	0.0	0.2
XIII	Articles of stone, plaster, cement	0.0	0.0	0.6	0.0	0.0	0.2
XIV	Precious stones and metals	0.0	0.0	0.7	0.0	0.0	1.2
XV	Steel	1.3	4.3	9.3	0.4	1.1	10.6
XVI	Machinery and electrical	0.0	0.0	40.9	0.0	0.0	27.8
XVII	Transport equipment	4.1	34.8	6.3	0.0	0.0	0.5
XVIII	Other instruments	1.9	3.7	9.9	0.0	0.0	0.7
XIX	Arms and ammunition	0.0	0.0	0.0	0.0	0.0	0.0
XX	Miscellaneous manufactured articles	0.0	0.0	0.4	0.0	0.0	0.2
XXI	Works of art	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.6	4.5	100	0.2	1.9	100

Source: Author's calculations using data from Bown (2010b) and COMTRADE.

Table 4: Participation of Chinese Firms as Petitioners in AD Cases, 1997-2009

a. Number of Firms

Year	Average number of firm listed as petitioners in an AD case	Total number of AD cases	Average number of firm listed as petitioners in an AD petition	Total number of AD Petitions
1997	9.0	3	9.0	1
1998	-	0	-	0
1999	3.0	7	3.0	4
2000	2.0	3	2.0	1
2001	3.2	13	3.3	4
2002	3.8	30	3.6	9
2003	2.6	21	4.0	6
2004	2.0	26	2.0	8
2005	2.3	24	1.9	7
2006	2.5	10	2.8	5
2007	3.0	4	3.0	1
2008	1.2	11	1.2	5
2009	3.7	11	2.8	5
Total	2.8	163	2.8	56

Notes: A single AD petition for a product may be directed against more than one country. We treat each product-country combination as a separate AD case. In addition, we drop the nine cases where the AD petition was filed by an industry association during this period.
Source: Author's calculations using data from Bown (2010b).

b. AD Cases and Outcomes for Chinese Firms Involved in More than One AD Petition

Name of Firm	Product under investigation	Countries (ISO 3)	Year of initiation	Final AD imposed	Year revoked	Average ad valorem rate	
						Minimum	Maximum
Beijing Oriental Chemical No. 4 Plant	Spendex	KOR, SGP, TWN, JPN, USA	2005	AVD	In Force	18.0	61.0
Beijing Oriental Chemical No. 4 Plant	Glassine and Other Glazed Transparent or Translucent Papers	USA, EUN	2005	AVD	In Force	7.1	42.8
Daxinanling Lixue Potato Starch Co. Ltd.	Butan-1-Ol (N-Butyl Alcohol)	RUS, JPN, EUN, ZAF, USA, MYS	2005	Negative injury	-	-	-
Daxinanling Lixue Potato Starch Co. Ltd.	Potato Starch	EUN	2006	AVD	In Force	17.0	35.0
Gansu Xinda Potato Starch Co. Ltd.	Octylphenol Nonylphenol and their Isomers and Salts Thereof	TWN, IND	2005	AVD	In Force	8.2	20.4
Gansu Xinda Potato Starch Co. Ltd.	Potato Starch	EUN	2006	AVD	In Force	17.0	35.0
Guangdong Xinhui Meida Nylon Co. Ltd.	Polycaprolactam/Polyamide-6 (PA6)/Nylon6	TWN, RUS, EUN, USA	2009	AVD	In Force	11.8	37.2
Guangdong Xinhui Meida Nylon Co. Ltd.	Chloroform (Trichloromethane)	KOR, IND, EUN, USA	2003	AVD	In Force[1]	80.0	96.0
Guangdong Zhaoqing Xinhu Biotech Co. Ltd.	Disodium 5'-Inosinate/Disodium 5'-Guanylate	THA, IDN	2009	AVD	In Force	5.6	29.7
Guangdong Zhaoqing Xinhu Biotech Co. Ltd.	Dimethyl Cyclosiloxane or Cyclic Dimethyl Siloxane	EUN, JPN, USA	2004	AVD	In Force	14.8	22.0
Jilin Chemical Co. Ltd.	Spendex	KOR, SGP, TWN, JPN, USA	2005	AVD	In Force	18.0	61.0
Jilin Chemical Co. Ltd.	Polybutylene Terephthalate Resin (PBT)	JPN, TWN	2005	AVD	In Force	6.2	17.3
Jilin Chemical Co. Ltd.	Trichloroethylene	RUS, JPN	2004	AVD	In Force	81.0	159.0
Jilin Chemical Co. Ltd.	Bisphenol-A (BPA)	RUS, SGP, TWN, JPN, KOR	2004	Withdrawn	-	-	-
Lianyungang Sanjili Chemical Industry Co. Ltd.	Disodium 5'-Inosinate Disodium 5'-Guanylate	JPN, KOR	2004	AVD	In Force	25.0	119.0
Lianyungang Sanjili Chemical Industry Co. Ltd.	Catechol	EUN	2002	AVD	In Force	20.0	79.0
Oriental Chemical (BOCIG)	Esters of Acrylic Acid	JPN, EUN, USA	1999	AVD	2005[2]	31.0	63.5
Oriental Chemical (BOCIG)	Esters of Acrylic Acid	IDN, SGP, MYS, KOR	2001	AVD	In Force[3]	11.8	32.8
Qilu Chemical (Sinopec)	Spendex	KOR, SGP, TWN, JPN, USA	2005	AVD	In Force	18.0	61.0
Qilu Chemical (Sinopec)	O-Dihydroxybenzene(Catechol Pyrocatechol)	USA, JPN	2005	AVD	In Force	23.4	44.8
Qilu Chemical (Sinopec)	Dimethyl Cyclosiloxane or Cyclic Dimethyl Siloxane	EUN, JPN, USA	2004	AVD	In Force	14.8	22.0
Qinghai Weisidun Biotech Co. Ltd.	Butan-1-Ol (N-Butyl Alcohol)	RUS, JPN, EUN, ZAF, USA, MYS	2005	Negative injury	-	-	-
Qinghai Weisidun Biotech Co. Ltd.	Potato Starch	EUN	2006	AVD	In Force	17.0	35.0
Shanghai Baosan Steel Group	Grain Oriented Flat-rolled Electrical Steel	RUS, USA	2009	AVD	In Force	7.1	44.4
Shanghai Baosan Steel Group	Cold-Rolled Steel Products	RUS, UKR, TWN, KOR, KAZ	2002	AVD	2008	7.2	44.2
Wuhan Steel Group	Grain Oriented Flat-rolled Electrical Steel	RUS, USA	2009	AVD	In Force	7.1	44.4

Wuhan Steel Group	Grainoriented Other	RUS	1999	AVD	2004	6.0	62.0
Wuhan Steel Group	Cold-Rolled Steel Products	RUS, UKR, TWN, KOR, KAZ	2002	AVD	2008	7.2	44.2
Zhejiang Xin'an Chemical Co. Ltd.	Dimethyl Cyclosiloxane or Cyclic Dimethyl Siloxane	THA, KOR	2008	AVD	In Force	15.3	23.5
Zhejiang Xin'an Chemical Co. Ltd.	Trichloroethylene	RUS, JPN	2004	AVD	In Force	81.0	159.0

Notes: [1]China removed the AD measure against India in 2009; AD against other countries is still in force. [2]China removed the AD measure against EU in 2004; AD against other countries was removed in 2005. [3]China removed the AD measure against South Korea in 2009; AD against other countries is still in force.
Source: Author's calculations using data from Bown (2010b).