

Indian Antidumping Measures against China: Evidence from Monthly Trade Data

H. Vandenbussche and Ch. Viegelaehn

Discussion Paper 2012-25

Institut de Recherches Économiques et Sociales
de l'Université catholique de Louvain



Indian Antidumping Measures against China: Evidence from Monthly Trade Data^{*}

Hylke Vandenbussche[§]

Christian Viegelaan[‡]

Abstract China's importance for India as a trading partner has increased tremendously over the recent years. At the same time, China has become the main target of Indian antidumping measures with a number of measures that is unprecedented worldwide. This paper provides a detailed analysis of trade flows between the two emerging economies and investigates on which type of products and in which sectors the Indian government applies antidumping measures against China. Then this paper estimates the trade impact of those measures that were imposed during the Great Recession, using monthly data on exports from China to India. The use of monthly data is relatively new to the literature and allows a detailed examination of the trade impact of antidumping measures and its dynamics. This paper finds that antidumping measures decrease the Chinese export value and quantity to India immediately and to a significant extent. The impact is quite stable over time.

Key words Antidumping, China, Crisis, Import diversion, India, Great Recession, Monthly data, Product-level data, Temporary trade barriers, Trade, Trade impact, Trade policy, WTO

JEL classification F13, F14, F52, G01

^{*} This final version of this paper is forthcoming in the *Foreign Trade Review*. Any views and opinions expressed in this paper are those of the authors and not necessarily those of the institutions they are affiliated with.

[§] IRES-CORE (Université catholique de Louvain), Centre for Economic Policy Research (CEPR), LICOS Centre for Institutions and Economic Performance (KU Leuven).

[‡] Corresponding author; Université catholique de Louvain; Email: christian.viegelaan@uclouvain.be.

1. Introduction

Over the past two decades, there is no other trading partner that has gained as much importance for India as China. While the magnitude of trade flows with China was close to zero before the onset of Indian trade liberalization in 1991, trade between the two emerging economies has steadily gained momentum until 2011. In terms of numbers, China's share in Indian goods exports has risen from below 1.0% in the early 1990s to 1.7% in 2000 and 5.5% in 2011, making China the fourth largest recipient of Indian goods in 2011. Relations are even more pronounced for trade flows that go into the opposite direction with India importing goods with a value of more than 50 billion USD from China. This corresponds to an increase of the Chinese share in the Indian import value from 0.1% in 1990 to 2.8% in 2000 and 12.0% in 2011.¹

Since a few years, several high-level government meetings have been taking place to discuss trade relations between India and China. One topic that is frequently on the agenda of these meetings is the use of antidumping (AD) policy and disputes related to it.² While China has initiated only 4 cases against India, India has initiated 147 cases against China of which 120 ended with the imposition of measures against Chinese producers. In relative terms, this corresponds to 22.4% of all Indian AD initiations and 25.1% measures that India imposed against its trading partners worldwide between 1995 and 2011. Roughly every fourth Indian AD case is directed towards China. No other country worldwide is targeted by its trading partner as frequently as China by India.

The AD rules are part of the General Agreement on Tariffs and Trade (GATT) and allow members of the World Trade Organization (WTO), under certain conditions, to impose restrictions against foreign imports. If a particular product is dumped into the domestic economy, which legally means that it is imported at a price below "normal value"³, and if, additionally, dumping causes material injury to the domestic producers, then the domestic industry can file for AD protection. GATT Article VI and the AD Agreement stipulate that the government can then impose protection, which usually comes along with the introduction

¹ Authors' calculations are based on trade data from the UN Comtrade database.

² See newspaper article in *The Hindu*, "India-China meet to discuss trade disputes", 15 April 2012, as example for Indian press coverage of one of the latest meetings covering AD issues between India and China.

³ The normal value usually corresponds to the price of the product in the ordinary course of trade within the country in which the product originates.

of an AD tariff on the “dumped” imports that are imported from the producers in the target country under investigation.⁴

Among economists, AD measures are widely regarded as a form of protectionism that allows governments to safeguard the domestic economy from foreign competition, whenever there is demand for protection from domestic producer industries. However, as most economists would agree, trade protection had a detrimental impact on trade flows during the Great Depression of the 1930s, thereby worsening the economic situation at that time. For this reason, economists and policy makers have been wary of a repetition of such a scenario in the current economic crisis, referred to as Great Recession.

Indeed trade policy has increasingly become under monitoring worldwide. International organizations such as the World Bank have been analyzing extensively the use of temporary trade barriers, which provide governments with a way to raise the levels of trade protection within the rules of the GATT.⁵ In particular, Bown (2011) includes detailed country-specific reports on the use of AD policy during the crisis. These reports reveal that most countries in fact have not reverted more often to AD policy or other temporary trade barriers during the crisis. However, Tovar (2011) who focuses on India provides some evidence that this general conclusion does not fully hold for the case of India. Using detailed product-level data, she finds that about 4% of products have been under AD measures in 2009, which is more than would be predicted by the linear trend established from data in previous years. She also finds some evidence that India has raised its level of protection in 2008 and 2009 by not removing AD barriers that were actually supposed to be removed.⁶ Also more recent evidence by Bown (2012a) shows that the group of G20 emerging economies, which India makes part of, has increased its level of protection in 2011 compared to 2007.

The purpose of this paper is twofold. First, we provide some descriptive evidence on Indian imports from China and their composition and investigate in which sectors and on which type of products the Indian government applies AD policy against China, thereby contributing to the monitoring efforts regarding the use of AD policy. Second, we investigate

⁴ The GATT regulations are implemented into the Indian national law through the Customs Tariff Act of 1975 and the Customs Tariff Rules of 1995 on “identification, assessment and collection of antidumping duty on dumped articles and for determination of injury”, including subsequent amendments.

⁵ Besides AD measures, also countervailing duties and safeguard measures are trade protection measures that are labeled “temporary trade barriers”.

⁶ After an AD measure has been in place for five years, it can be extended by means of an affirmatively ruled sunset review in which the government confirms that dumping and injury are likely to re-occur in case the measure would be removed.

the trade impact of India's most recent affirmatively ruled AD cases against China, initiated in 2009-2010. Hereby we go one step beyond the monitoring efforts described above and examine whether increased protection that is observed in India during the crisis has actually led to any significant reductions in trade flows. Using recently released monthly trade data from the UN, we are able to identify the impact of India's most recent AD measures against China on Chinese exports to India and reveal its dynamics on a monthly basis, distinguishing between export quantities and values.

There are some studies in the literature which have examined the trade impact of Indian AD policy. Aggarwal (2011) focuses on the period from 1994 to 2001 and finds a negative impact of AD policy on both trade values and volumes which leads her to the conclusion that "AD action is effective in trade contraction" for India. Ganguli (2008) obtains a similar result, finding a negative impact of Indian AD policy on targeted imports. Malhotra and Malhotra (2008) implement a case study for the pharmaceutical industry and find that imports in this industry decline as a consequence of AD policy.

Our paper fits into this line of the literature that examines the impact of AD policy on trade flows, but is to our knowledge the first one that matches information on AD cases with monthly data, looking at the trade impact of AD policy at the monthly level.⁷ Hereby we make use of the monthly Comtrade database on trade flows that has recently been made available by the UN. Besides providing detailed insights on the dynamics of the trade impact of AD measures that were imposed during the Great Recession, the use of monthly data has the advantage that the trade impact of AD is less likely to be blurred by other factors influencing trade.

The remainder of the paper is organized as follows. In Section 2, we briefly discuss trade relations between India and China and their evolution over time and provide some descriptive evidence on the use of Indian AD policy against China. Section 3 introduces the data and the methodology that are used in the empirical analysis. Section 4 presents and discusses our findings regarding the impact of Indian AD policy against China on Chinese exports to India. Section 5 concludes.

⁷ Hillberry and McCalman (2011) also use monthly data. They do not investigate the impact of AD policy on trade flows, but examine which types of shocks trigger AD petitions.

2. Indian-Chinese Trade Relations

Trade between India and China and its characteristics

India and China have been among the world's most dynamic economies over the past decades, exhibiting economic growth rates that have surpassed those of many other economies in the region. The annual average GDP growth rate of China has been 10.6% over the last decade with double-digit growth rates in almost all years, but also India has grown at a fast pace with an average growth rate of 7.8% in the same period.

[Figure 1]

Figure 1 shows GDP growth rates as reported by the IMF and illustrates that the Great Recession hit both "Asian giants" to a similar extent. It came along with a decline of both China's and India's GDP growth by around 4 percentage points in 2008. In 2009, GDP growth then remained almost unchanged. In 2010, though both emerging economies recovered, India recovered to a stronger extent than China, surpassing Chinese GDP growth by 0.2 percentage points and reaching more than 10%, raising India's hope that double-digit growth would be feasible for an extended period in the near future. However, growth has slowed down again in 2011, more in India than in China, with China and India reaching growth rates of 9.2% and 7.2%, respectively.

More recently, quarterly GDP growth numbers for India in 2012 have fallen to rates between 5 and 6%, raising the attention worldwide and triggering the IMF to call for a "wide range of structural reforms" in India.⁸ Given the counter-cyclical policy with which AD policy has typically been applied in the past⁹, the increased use of AD policy by the Indian government would not be a surprise in this situation. However, as Marelli and Signorelli (2011) find, large economic growth rates in both India and China have been very much supported by trade openness in the past which would call for restraints when it comes to trade policy if these results are taken literally.

Besides revealing recent trends in GDP growth in both countries, Figure 1 illustrates the co-movements of Chinese and Indian GDP growth since the 1980s. Indian and Chinese GDP growth have evolved quite differently before 1991, the year in which trade started to be

⁸ See Public Information Notice No. 12/36, 17 April 2012, International Monetary Fund.

⁹ See, for example, Knetter and Prusa (2003).

liberalized in India as a consequence of the economic crisis at that time. In the 1990s, trends in GDP growth rates have become more similar. In the 2000s, trends almost moved in a parallel fashion with Chinese GDP growth exceeding Indian GDP growth by 2-4 percentage points in all years except 2010.

Indeed, when calculating the correlations between the growth rates of the two emerging economies' GDP, we find that the correlation is -0.21 for 1980-1990, -0.05 for 1990-2000, and 0.79 for 2001-2011. The evolution of the correlations suggests that both India and China have been increasingly exposed to the same macroeconomic shocks over time. This evolution is also in line with the fact that India and China have become more integrated with each other in terms of trade.

[Figure 2]

Figure 2 shows in panel a) the export value of India to China and the import value of India from China. In “fob” terms, Indian goods exports to China have reached a level of around 17 billion USD in 2011, steadily increasing from 1988 to 2010 and slightly declining in 2011. The value of Indian imports from China, measured in “cif” terms, has increased even more sharply to a level of more than 55 billion USD in 2011.

Since the increase of trade flows from and to India is a trend that can be observed also for other trading partners than China, it is useful to calculate the share of China in Indian imports and exports as relative measure. This is shown in panel b) of Figure 2 and reveals that China has also gained importance for India as a trading partner in relative terms. While shares of China in Indian trade were close to zero until 2000, these have increased to 12% for the import value and 5.5% for the export value in 2011.

[Table 1]

Table 1 includes on the left-hand-side the distribution of Chinese imports over different sectors for 2001, 2006 and 2011. As sectors we use the 21 different sections of the Harmonized Commodity Description and Coding System (HS) from the World Customs Organization, into which traded products are classified.

As shown in Table 1, imports from China are concentrated in relatively few sectors. Particularly eye-catching is that machinery has gained much in importance, accounting for

more than 40% of imports from China in 2011 and being the sector in which India imports most of its goods. Although it has been the most important sector in terms of import value already in 2001, the share was considerably lower at that time with a value of 23%. India imports also many chemical products, which accounted for the second largest share of imports in 2011 with 16%. The base metals sector is the third largest sector in terms of import value from China with a share of 8.6% in total import value of 2011. The share of import value in both the mineral products and the textiles sectors has declined. While more than 20% of the total import value was created by mineral products in 2001, this share has declined to 3% in 2011. Textiles experienced a similar decline from 11.9% in 2001 to 3.9% in 2011.

While it is insightful to know to which sectors the products belong to that China has been shipping to India over the last decade, the left-hand-side of Table 1 does not reveal whether these trends are specific to China or whether they concern imports from all countries. Therefore, we apply a Balassa (1965) type of index on the Indian import data. Calculated for China, this index indicates how much each sector contributes to the import value from China relative to the contribution of the same sector to the import value from other countries. In other words, we divide the sectoral share of imports from China by the sectoral share of imports from all countries except China. This gives us an indication how important China is with respect to imports in a specific sector, compared to India's other trading partners.

The values of this index, calculated as just described, are shown on the right-hand-side of Table 1. A value of one for a certain sector corresponds to a situation in which the weight of this sector in the Chinese import value is exactly equal to the weight of this sector in the value of imports from all other countries. If the index takes on values that are greater than one, it can be interpreted as evidence for a comparative advantage in the respective sector of China in Indian imports. With a value that is smaller than one, the respective sector has a larger share in the import value from other countries than in the import value that is shipped from China.

Results show that China is dominant relative to other countries especially in the footwear industry that account for a share in Chinese imports that is almost 15 times larger than the share in other countries' imports. Prevalent, but less pronounced, is the dominance of China in the imports of products from the chemical, leather, stones and glass, machinery and transport equipment industry, respectively.

[Figure 3]

In Figure 3, we split up the Indian import value by type of product on the basis of the Broad Economic Categories (BEC) classification, distinguishing between consumption goods, intermediate goods and capital goods. We again do a separate analysis of imports coming from China and from the rest of the world, respectively. Interestingly, we find that the share of capital goods has increased in Chinese imports from 7.6% in 1996 to 28.4% in 2011. This is a trend that is specific to China and is not found for India's other trading partners. In 2011, intermediate goods accounted for 63.3% of the import value from China. This is less than the 90.3% that intermediate goods accounted for in the import value from other countries. Consumption goods are only present to a small extent in Indian imports, so most final goods seem to be produced and sold within India.

Indian antidumping policy against China

Between 1991, when India initiated its first AD case, and the first quarter of 2012, India initiated 650 AD cases against its trading partners. In 1994, India initiated its first AD case against China on Isobutyl Benzene, imposing a specific duty for five years from 1995 to 2000. On the whole, 148 AD cases were initiated against China which is roughly 23% of all cases. Over the 2000s, India has not only become the main user of AD policy worldwide, but is also the country with the largest number of initiations against one single trading partner worldwide.

In order to shed light into the patterns of Indian AD policy against China, we calculate how many imports from China in terms of value are under AD protection making use of the annual data on Indian imports from China at the HS 6-digit product level that can be found in the Comtrade database of UN. Figure 4 shows that, in most years, more than 10% of the Chinese import value has been under AD protection. In 2009, it was even more than 16% of all imports from China, on which AD duties were collected or other measures were imposed. In 2011, this share has come back to 10%. Tovar (2011) who uses the same data sources and calculates the share of total Indian import value under AD protection, not restricting the analysis to China, finds shares in the range between around 1.5% and 3.5% within the last ten years.¹⁰ The fact that Chinese import shares under AD are much higher illustrates the Indian focus on China as AD target.

[Figure 4]

¹⁰ These numbers are implied by Figure 7.2 in Tovar (2011).

Table 2 shows the share of import value from China which falls under AD protection by sector. Closely following Vandenbussche and Viegelahn (2011) who analyze the use of AD policy in the European Union, we shade for each sector and year the corresponding cell in the table according to the degree of AD coverage. The darker shaded the cells in the table, the larger the share of import value on which AD measures are imposed. This way of illustrating the degree of protection allows getting a quick grasp of India's use of AD policy across sectors and over time.

[Table 2]

Table 2 shows that Indian AD policy has been applied against China in 13 out of 21 sectors, where the definition of sectors follows Table 1. While AD policy is typically viewed as an “exception” to the most-favoured-nation (MFN) principle of the WTO rules, also by the WTO itself¹¹, Table 2 shows that AD protection of India against China has in fact become the rule in some sectors.

Heavily protected from dumping is in particular the food and beverages sector with in some years more than 70% of the import value under AD protection. In 2011, this share has decreased to 33% which is still the highest share across all sectors. However, one needs to take into account that the amount of imports in this sector is relatively small as shown before in Table 1. Also textiles and plastics and rubber are prominent sectors for Indian AD policy against China with currently around 27% of imports from China in both sectors under AD. Among these three sectors, textiles is the one into which most imports from China can be classified. An important role in Indian AD rulings also plays the chemicals sector with 16% of the import value under AD. Mineral products have been prominent in Indian AD rulings until 2009.

Our analysis demonstrates that AD plays an important role also in small sectors such as food and beverages – something that would likely not be revealed if we simply counted the cases for this sector. It seems important to consider the share of imports as additional indicator on the use of AD policy, since only this indicator can provide some guidance on the economic importance of AD policy.¹²

¹¹ See http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm8_e.htm.

¹² As discussed by Vandenbussche and Viegelahn (2011), this indicator may in fact underestimate the “true” economic importance of AD policy. As shown also in this paper, trade flows are likely to be depressed as a

[Figure 5]

Figure 5 follows Vandebussche and Viegelaahn (2011) and classifies products under AD into intermediate, consumption and capital goods. It shows that AD policy is predominantly applied on intermediate products from China with an import value of 15-25% covered in the recent years. Intermediate products have always been those products on which most AD measures were applied against China.

While the share of consumption and capital goods imports under AD has been close to zero until 2007, consumption goods like opal glassware or recordable DVDs from China have been put under AD during the Great Recession. Similarly, measures have been put in place on capital goods such as weaving machines, plastic processing machinery or tyre curing presses. To have larger import shares of consumption and capital goods covered by AD seems to be a new trend in Indian AD policy which was prevalent at least during the last three years.

3. Trade Impact of Antidumping Measures: Data and Methodology

Having provided in quite some detail a descriptive overview of Indian imports from China and their characteristics on the one hand and Indian AD policy against China on the other hand, this section now aims at identifying the impact of AD measures on trade flows from China. In order to perform such an analysis, this paper relies on data from two sources. The first database is the World Bank's Global Antidumping Database (Bown, 2012b) which contains data on all AD cases worldwide. For India, the database starts in 1992 when the first AD case was initiated by the Indian government. The current version of the database ends with a case that was initiated in the beginning of 2012. From the Global Antidumping Database, we extract information on 14 Indian AD cases that were initiated against China between 2009 and 2010 and for which AD measures were imposed in either 2010 or 2011.

[Table 3]

consequence of AD measures which has an impact on the size of this indicator. Therefore, the import shares cited here should be perceived rather as a lower bound estimate of the "true" economic importance of AD policy.

Table 3 provides an overview of the 14 Indian AD cases against China that are considered. These cases involve 48 products at the HS 6-digit level which belong to five different sectors: chemicals, plastics and rubber, textiles, stones and glass, and machinery. The 48 products are intermediate products as well as consumption and capital goods.

The database on Indian AD cases against China is merged with a second database, UN's recently released monthly Comtrade database which contains bilateral import and export data in terms of both values and quantities for 70 reporter countries, starting from January 2010. Since for India, data are so far only reported for one month, we cannot use Indian import data for our analysis. As a consequence, we extract information on China's exports to India for the products involved in the 14 AD cases initiated between 2009 and 2011. Monthly trade data is taken for the period from January 2010 to May 2012.

The estimator that is used to identify the impact of AD measures on trade flows is the Pseudo Poisson Maximum Likelihood Estimator (PPML) with fixed effects. This estimator takes into account one of the basic problems that a researcher is confronted with when modeling trade flows: trade flows may be zero. Especially when considering trade flows at a narrowly defined product level and on a monthly basis, as we do, this is not a rare case, such that the use of an estimator that can account for zeros is particularly relevant in our context.¹³

If we simply took the logarithm of the value or quantity of trade and used an OLS-based estimation methodology, all observations with zero trade would drop out of our estimation sample, not entering our regression. This would likely create a bias of our estimated policy impact: if AD measures were prohibitive and caused China to completely stop exporting the product under AD, then we would likely underestimate the true impact of AD on Chinese exports to India to a large extent. This is due to the fact that zero trade flows are excluded from the sample when taking the logarithm.

The PPML allows us to consistently model trade flows, since this methodology can be directly applied to levels of trade such that zeros do not drop out. In particular, we estimate the following equation:

$$EXP_{it} = \exp(\alpha + \beta_1 PR_{1,it} + \beta_2 PR_{2,it} + \dots + \beta_{n,it} PR_{n,it} + \varepsilon_t + \varepsilon_i) \varepsilon_{it} \quad (1)$$

¹³ See WTO/UNCTAD (2012) and Santos Silva and Tenreyro (2006) for a detailed discussion on the application of PPML in the context of modeling trade flows.

EXP_{it} corresponds to the value or quantity of Chinese exports to India of product i in month t . ε_t and ε_i are monthly and product-specific fixed effect, respectively. ε_{it} is the error term.

$PR_{1,it}, PR_{2,it}, \dots, PR_{n,it}$ are dummy variables that have a value of 1 in case an AD measure is in place 1, 2, ..., n months, respectively, after it has been imposed. Estimating the impact for each month separately, we can derive the dynamics of the impact of AD policy. This is particularly interesting when using monthly data as we do, since we get to know if exports from China to India change immediately due to AD protection or if it takes some time for them to adjust to the AD measures. We also estimate equation (1) by simply including a dummy that takes on a value of one always when an AD measure is in place, which gives us an estimate of the average policy impact.

Equation (1) is estimated on the panel of 48 products on which the Indian government initiated AD cases against China in 2009-2010 and imposed measures in 2010-2011. The sample of Chinese export data covers the time period from January 2010 to May 2012, giving us 29 observations for each product in the time dimension. We report heteroskedasticity-consistent estimates of standard errors.

4. Trade Impact of Antidumping Measures: Results

This section discusses the results that we get for the impact of Indian AD measures against China on the value and quantity that China exports to India, when estimating equation (1) with the PPML estimator.

[Table 4]

Table 4 is a regression table that shows the results for the export value and reveals that AD measures have a significantly negative impact on trade flows that fall under these measures. The estimated coefficient for the average effect is significant and takes on a value of -0.16. This corresponds roughly to a 15% decrease of the Chinese export value to India after controlling for time and product-specific fixed effects. We also find significant, quantitatively larger effects for some months, when allowing for a heterogeneous effect of

AD protection over time. In particular, we find significant coefficients when looking at the impact of AD measures three, four and six months after they have been imposed.

Figure 6 shows the estimated coefficients for each month together with the 90% confidence interval. Although we find that coefficients are not always significant, which may be due to the fact that we are considering only 47 products in our panel and therefore have too few observations in the cross-dimension¹⁴, we find a clear pattern of a negative impact that immediately follows the imposition of the AD measure.

[Figure 6]

Table 5 shows the results of the PPML regression for the export quantity. Here the impact is estimated to be even stronger with a coefficient of 0.28, significant at the 10% level. Again, when splitting up and considering the potential heterogeneity of the impact over time, we also find significance for the second, third and fourth month that AD protection is in place. In addition, the coefficient of the dummy variable that has a value of one if the AD measure has been in place for more than 6 months is significant. Coefficients in between, despite not being significant, seem to generally fit well into the estimated pattern.

[Table 5]

Figure 7 then again is a graphical representation of results with a graph that looks similar as the one in Figure 6. However, evidence for an impact on the export quantity seems to be a bit stronger than evidence for values. For both values and quantities, we can nevertheless reliably identify a negative impact.

[Figure 7]

The fact that the impact on quantities seems larger than the one on values may be due to an impact of AD protection on the export price, especially given that the Indian government

¹⁴ One product drops out of the regression, since trade is perfectly explained with the product-specific fixed effect.

imposed on 3 of the 47 products that enter the regression an AD duty, which is only applied in case the price of the good does not exceed a certain threshold. Such an AD duty provides incentives to Chinese exporters to raise their price.

Summarizing our results, we find that Indian AD measures are depressing trade flows from China during the Great Recession. This is in line with what has been previously found in the literature. As additional finding, we reveal that the impact of AD measures is quite immediate, so exports are jumping down to a new level rather than adjusting slowly when an AD measure is imposed. The impact seems then to be quite stable over time.

5. Conclusion

This paper provides new descriptive evidence on the trade relation between the two “Asian giants”, India and China. While trade values between the two countries have increased by a factor of 30 in the case of imports and 18 in the case of exports over the last decade, no other country is targeted with AD policy as often by its trading partner as China by India.

In this paper, we have shown several interesting facts about Indian imports from China. In particular, it seems that machinery imports have gained much in importance in recent years. Also chemical products and base metals are imported much from China. Equally, footwear plays an important role in trade flows from China to India, relative to imports coming from other countries. Regarding the type of product, it seems that especially capital goods have gained momentum in Indian imports from China.

AD policy seems to be applied to a large extent in the food and beverages industry, but also in chemicals, plastics and rubber, and textiles. The import value from China that is covered by AD measures exceeds 50% in some sectors, so that AD policy is rather the rule than the exception in these sectors. A recent finding is that AD policy has started to be applied on capital goods and consumption goods during the Great Recession. However, AD cases on intermediate goods are clearly dominating Indian AD cases against China.

The paper then takes the most recent AD cases initiated against India in 2009-2010 and estimates the trade impact of AD policy, using monthly data. AD policy has been intensively monitored worldwide, especially during the Great Recession, and our analysis contributes to these monitoring efforts. We find that Chinese exports to India decline significantly with an impact that is stronger for quantities than for values. The impact is found to be relatively immediate and quite stable over time.

This result is somewhat in line with the presumption that AD measures are beneficial for Indian producers that file for AD protection. However, what we do not examine in this paper, is whether there is any import diversion occurring, i.e. whether other trading partners replace those Indian imports from China that are kept out of India because of Indian AD measures. Given that AD policy is primarily applied on intermediate products coming from China, also importers and input users are likely to be affected by AD policy, presumably in a negative way. A closer analysis of these issues to provide a more comprehensive evaluation of India's AD policy is left to future research.

References

Aggarwal, A. (2011), 'Trade Effects of Anti-dumping in India: Who Benefits?', *International Trade Journal* 25(1), pp. 112-158.

Balassa, B. (1965), 'Trade Liberalisation and Revealed Comparative Advantage', *Manchester School of Economics and Social Studies* 33, pp. 99-123.

Bown, C. P. (2012a), 'Import Protection Update: Antidumping, Safeguards, and Temporary Trade Barriers through 2011', 18 August 2012, VoxEU.org.

Bown, C. P. (2012b), 'Temporary Trade Barriers Database', World Bank, July [available at <http://econ.worldbank.org/ttbd/>].

Bown (2011), 'The Great Recession and Import Protection: The Role of Temporary Trade Barriers', London, CEPR and the World Bank.

Ganguli, B. (2008), 'The Trade Effects of Indian Antidumping Actions', *Review of International Economics* 16(5), pp. 930-41.

Hillberry, R. and McCalman, P. (2011), 'What Triggers an Anti-Dumping Petition? Finding the Devil in the Detail', Working Paper, University of Melbourne.

Knetter, M. and Prusa, T. J. (2003), 'Macroeconomic Factors and Antidumping Filings: Evidence from Four Countries', *Journal of International Economics* 61, pp. 1-17.

Malhotra, N. and Malhotra, S. (2008), 'Liberalization and Protection: Antidumping Duties in the Indian Pharmaceutical Industry', *Journal of Economic Policy Reform* 11(2), pp. 115-122.

Marelli, E. and Signorelli, M. (2011), 'China and India: Openness, Trade and Effects on Economic Growth', *European Journal of Comparative Economics* 8(1), pp. 129-154.

Santos Silva, J. M. C. and Tenreyro, S. (2006), 'The Log of Gravity', *Review of Economics and Statistics* 88, pp. 641-658.

Tovar, P. (2011), 'The Use of Temporary Trade Barriers', in C. P. Bown (ed.), *The Great Recession and Import Protection: The Role of Temporary Trade Barriers*, London, CEPR and the World Bank.

Vandenbussche, H. and Viegeln, C. (2011), 'European Union: No Protectionist Surprises', in C. P. Bown (ed.), *The Great Recession and Import Protection: The Role of Temporary Trade Barriers*, London, CEPR and the World Bank.

WTO/UNCTAD (2012), 'A Practical Guide to Trade Policy Analysis', Geneva, World Trade Organization and United Nations Conference on Trade and Development.

Tables

Table 1. Distribution of Indian import value from China by sector

Sector	Share of sector in total Indian import value from China (in %)			Share of sector in total Indian import value from China / Share of sector in total Indian import value from other countries (Ratio)		
	2001	2006	2011	2001	2006	2011
Animal products	0.3	0.1	0.1	7.5	2.2	0.7
Vegetable products	1.5	0.4	0.5	0.8	0.3	0.4
Fats and oils	0.0	0.0	0.2	0.0	0.0	0.1
Food and beverages	0.4	0.2	0.2	1.1	1.2	0.8
Mineral products	20.3	8.3	3.0	0.6	0.2	0.1
Chemicals	22.3	14.8	16.0	2.6	2.0	2.4
Plastics and rubber	1.4	2.5	3.0	0.7	1.2	1.2
Leather	0.4	0.3	0.3	0.8	1.3	2.5
Wood	0.1	0.1	0.3	0.1	0.2	0.5
Pulp and paper	0.2	0.9	0.8	0.1	0.7	0.8
Textiles	11.9	7.1	3.9	4.8	7.1	5.9
Footwear	0.7	0.4	0.4	16.7	9.6	14.8
Stones and glass	1.6	1.9	1.7	3.9	6.1	6.7
Precious stones	4.7	0.4	3.3	0.2	0.0	0.1
Base metals	5.4	11.0	8.6	1.1	1.8	1.6
Machinery	23.4	43.9	41.5	1.7	2.9	3.8
Transport	0.4	1.9	4.6	0.2	0.3	2.4
Instruments	2.6	1.4	1.8	1.1	0.8	1.3
Arms, ammunition	0.0	0.0	0.0	0.0	0.1	0.2
Miscellaneous	2.0	1.9	1.7	8.7	0.8	8.8
Art	0.0	0.0	0.0	0.2	0.1	5.7
Total	100.0	100.0	100.0	-	-	-

Source: Authors' calculations based on UN Comtrade.

Table 2: Share of sectoral import value from China under AD measures, by sector

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Animal products																
Vegetable products																
Fats and oils																
Food and beverages						■	■	■	■	■	■	■	■	■	■	■
Mineral products	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Chemicals	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Plastics and rubber			■			■									■	■
Leather																
Wood														■	■	■
Pulp and paper											■	■	■		■	■
Textiles								■	■	■	■	■	■	■	■	■
Footwear																
Stones and glass								■	■	■	■	■	■	■	■	■
Precious stones																
Base metals			■	■	■				■	■				■	■	■
Machinery				■	■									■	■	■
Transport														■	■	■
Instruments														■	■	■
Arms, ammunition																
Miscellaneous																
Art																

0%	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	>60%
	■	■	■	■	■	■	■

Source: Authors' calculations based on UN Comtrade and the Global Antidumping Database (Bown, 2012b).

Table 3. Indian antidumping cases against China, initiated in 2009-2010

Product	Date of initiation	Number of HS products	Outcome
Viscose Staple Fibre excluding Bamboo Fibre	19 Mar 2009	1	Specific duty
Circular Weaving Machines (having six or more shuttles for weaving PP/HDPE Fabrics of a width exceeding 30 cms.)	18 May 2009	2	Specific duty
Barium Carbonate	16 June 2009	1	Specific duty
Coumarin	10 July 2009	1	Duty if price falls under given level
1,1,1,2-Tetrafluoroethane or R-134a of all types	19 Aug 2009	1	Specific duty
Poly Vinyl Chloride Paste Resin (PVC Paste Resin)	3 Nov 2009	2	Duty if price falls under given level
Sodium Tripoly Phosphate (STPP)	5 Nov 2009	1	Specific duty
Certain Glass Fibre and articles thereof	8 Jan 2010	8	Ad valorem duty
PVC Flex Films	1 Feb 2010	5	Specific duty
Sewing Machine Needles	19 May 2010	1	Specific duty
Paranitroaniline (PNA)	8 Jun 2010	1	Specific duty
Opal Glassware	26 Aug 2010	10	Ad valorem duty
Morpholine	7 Dec 2010	1	Specific duty
Geogrid/Geostrips/Geostraps made of Polyester or Glass Fiber in all its forms (including all widths and lengths)	20 Dec 2010	13	Specific duty

Source: Global Antidumping Database (Bown, 2012b). The table shows only cases for which AD protection was granted.

Table 4. Pseudo-Poisson Maximum Likelihood (PPML) estimation: Impact of AD measures on the Chinese export value to India at the HS 6-digit product level

	Dependent variable: Export value	
	(1)	(2)
AD protection		-0.16085* (.0896)
AD protection in 1st month	-0.05979 (0.115732)	
AD protection in 2nd month	-0.11963 (0.10351)	
AD protection in 3rd month	-0.22379*** (0.068228)	
AD protection in 4th month	-0.25929*** (0.103393)	
AD protection in 5th month	-0.01719 (0.170119)	
AD protection in 6th month	-0.2309* (0.120507)	
AD protection > 6th month	-0.16758 (0.135154)	
Year dummies	Yes	Yes
Product fixed effects	Yes	Yes
Wald Chi2 Test (p-value)	0.00	0.00
Number of products	47	47
Number of observations	1316	1316

Source: Authors' estimates based on UN Comtrade and Global Antidumping Database (Bown, 2012b).

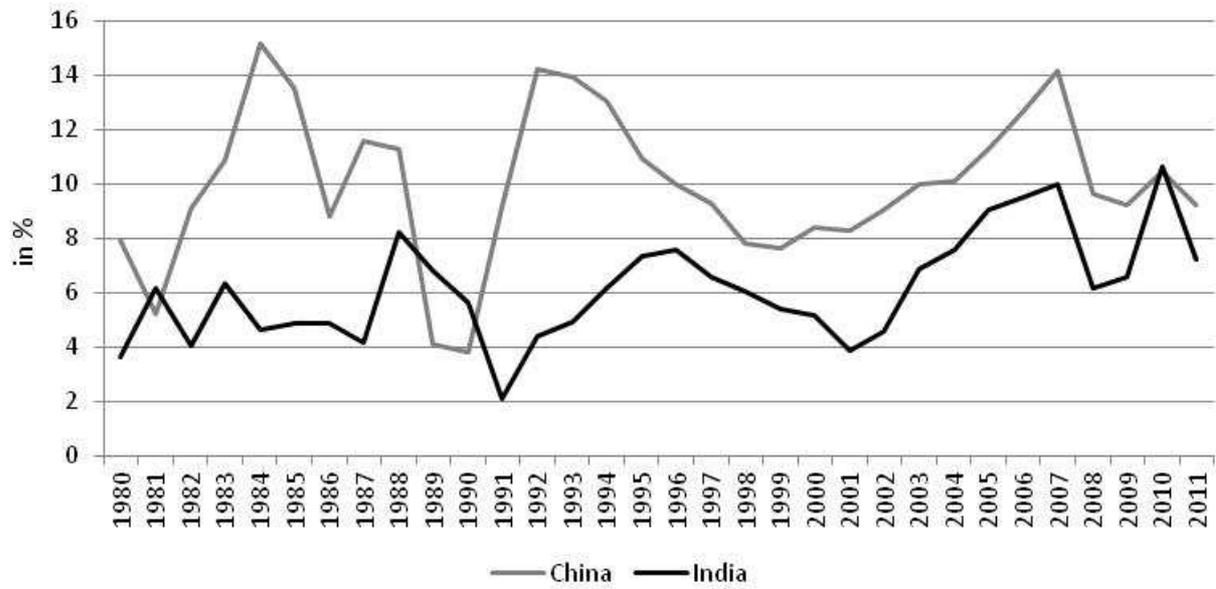
Table 5. Pseudo-Poisson Maximum Likelihood (PPML) estimation: Impact of AD measures on the Chinese export quantity to India at the HS 6-digit product level

	Dependent variable: Export quantity (in kilo)	
	(1)	(2)
AD protection		-0.27932* (.150277)
AD protection in 1st month	-0.16366 (0.11747)	
AD protection in 2nd month	-0.29182* (0.156337)	
AD protection in 3rd month	-0.349*** (0.134642)	
AD protection in 4th month	-0.25289* (0.142514)	
AD protection in 5th month	-0.14046 (0.163249)	
AD protection in 6th month	-0.31012 (0.189873)	
AD protection > 6th month	-0.36787* (0.208662)	
Year dummies	Yes	Yes
Product fixed effects	Yes	Yes
Wald Chi2 Test (p-value)	0.00	0.00
Number of products	1260	1260
Number of observations	45	45

Source: Authors' estimates based on UN Comtrade and Global Antidumping Database (Bown, 2012b).

Figures

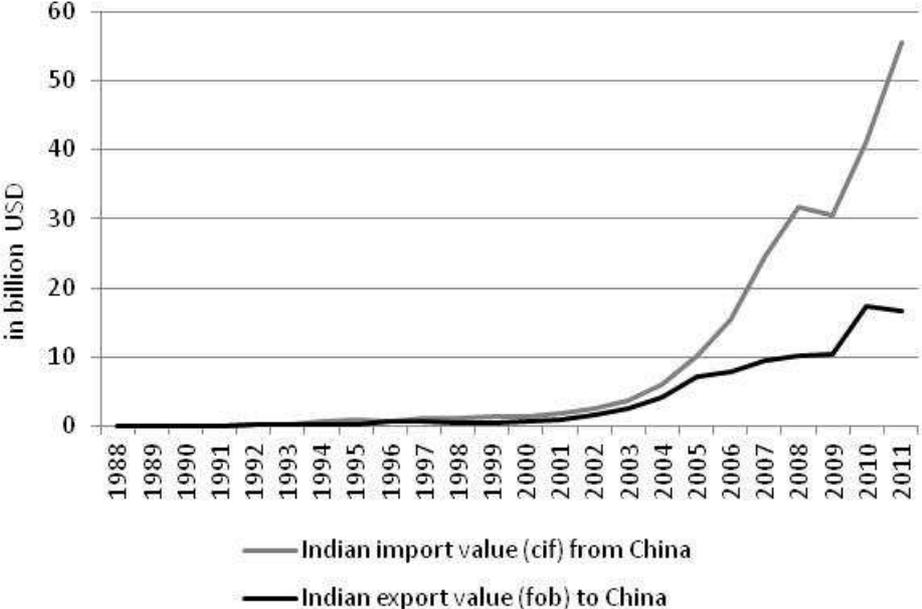
Figure 1. Annual GDP growth of India and China, in %



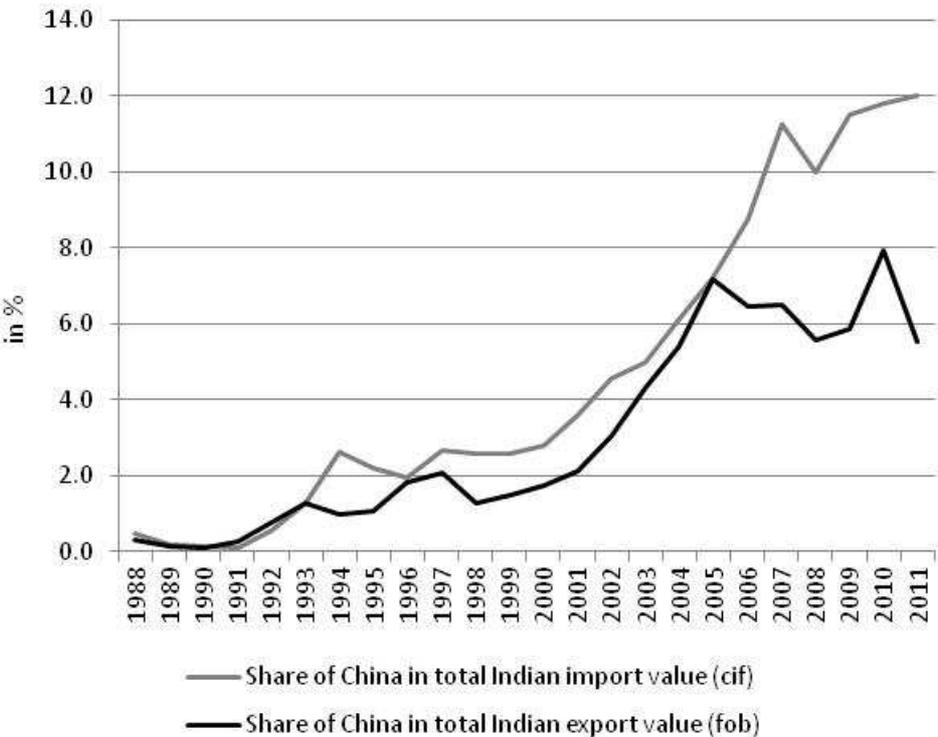
Source: IMF World Economic Outlook, April 2012.

Figure 2. Indian goods imports from China and goods exports to China

a. Absolute value (in USD)



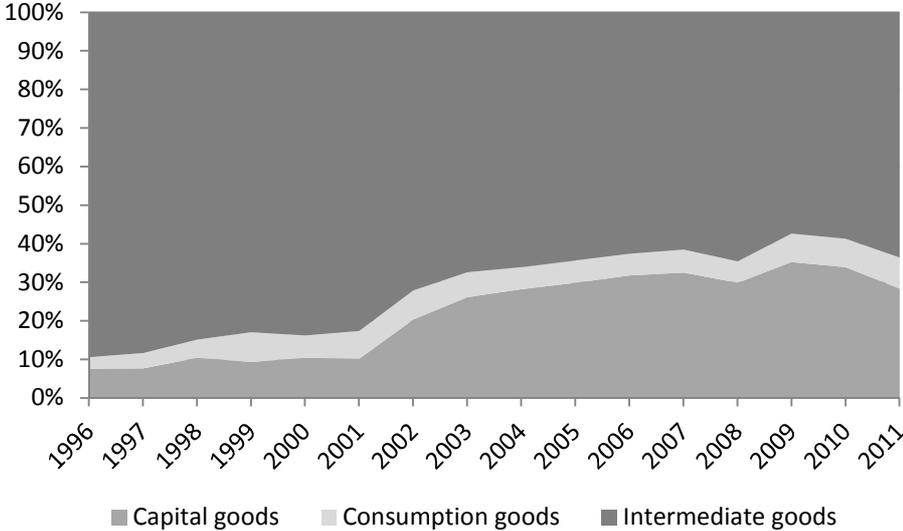
b. Share in total value (in %)



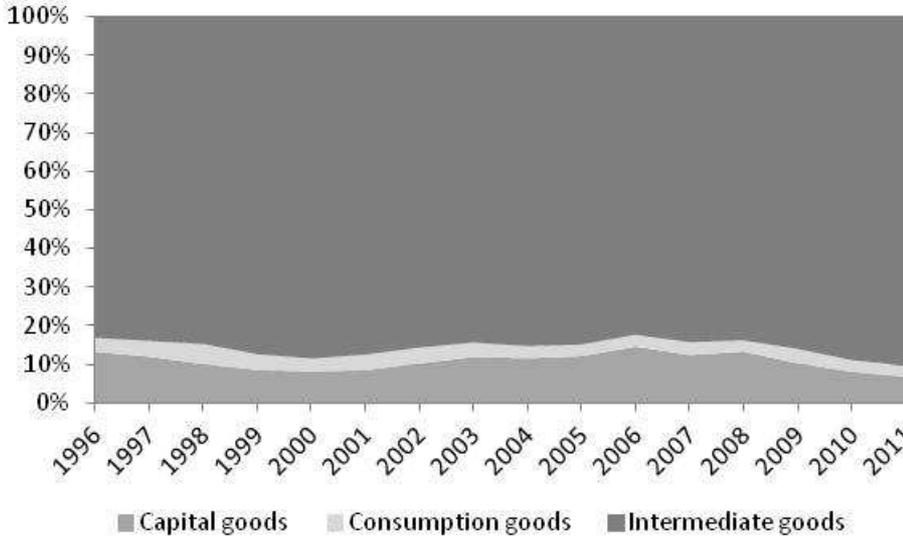
Source: Authors' calculations based on UN Comtrade.

Figure 3. Distribution of Indian import value by type of product

a. Imports from China

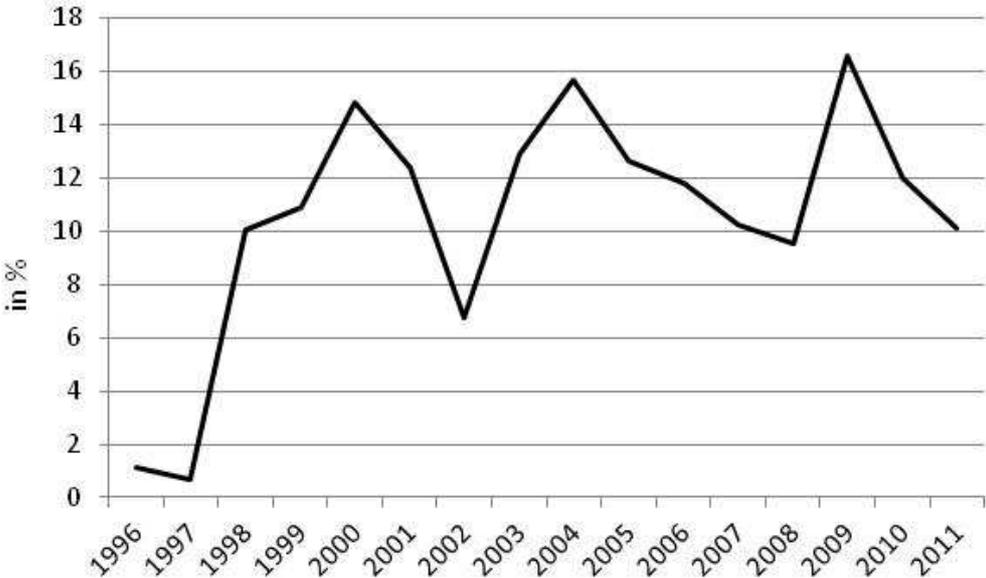


b. Imports from all countries except China



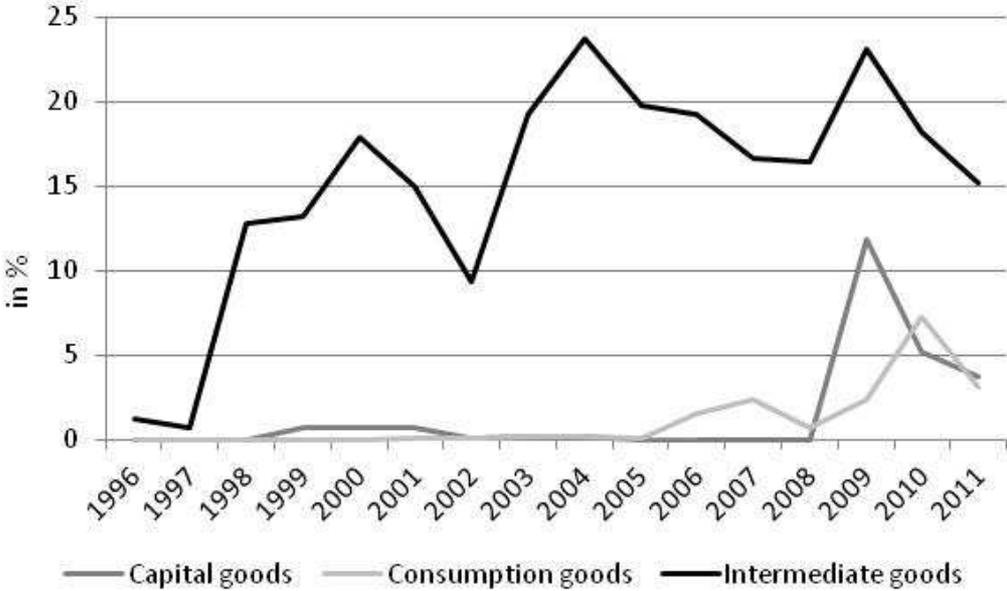
Source: Authors' calculations based on UN Comtrade and the BEC classification of goods.

Figure 4. Share of import value from China under AD measures



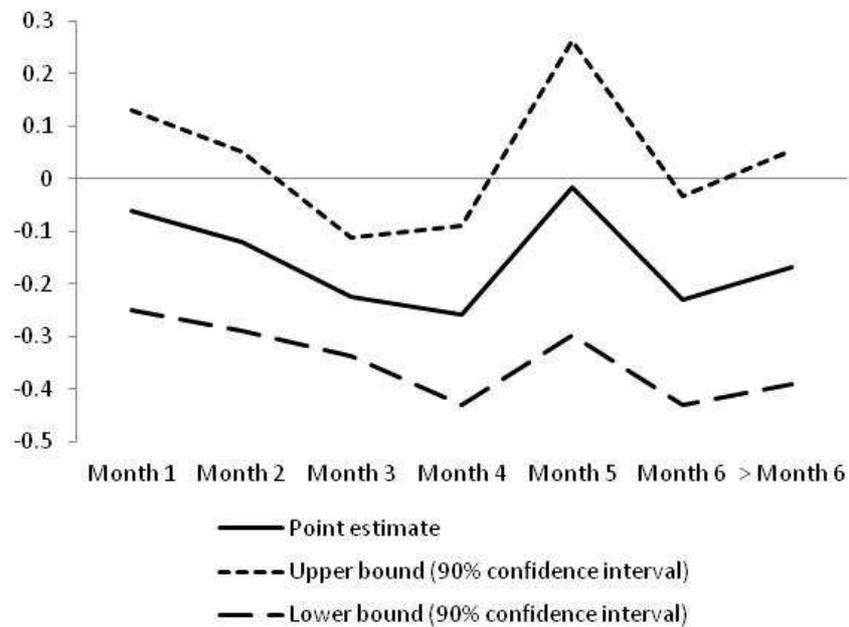
Source: Authors' calculations based on UN Comtrade and Global Antidumping Database.

Figure 5. Share of import value from China under AD measures, by type of product



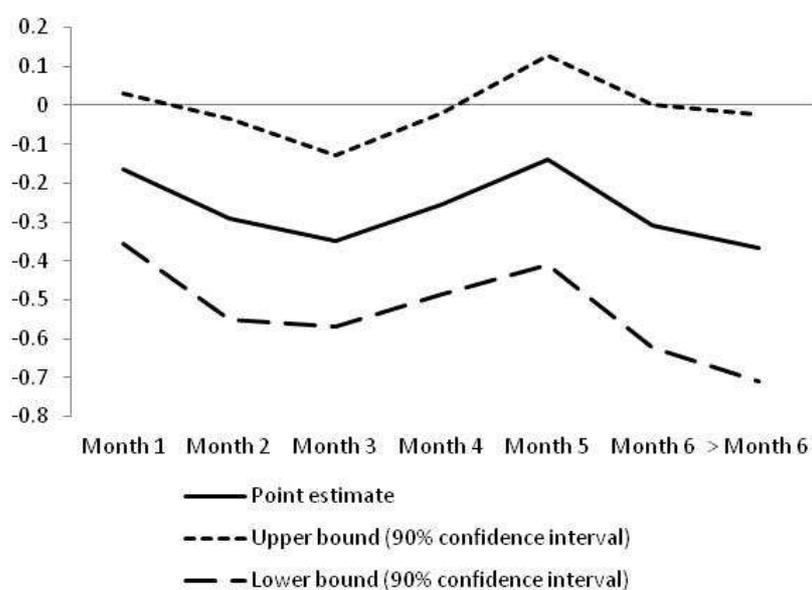
Source: Authors' calculations based on UN Comtrade, Global Antidumping Database (Bown, 2012b) and the BEC classification of goods.

Figure 6. Estimated monthly impact of AD measures on the Chinese export value to India at the HS 6-digit product level



Source: Authors' estimates based on UN Comtrade and Global Antidumping Database (Bown, 2012b).
 Note: Y-axis shows value of estimated coefficient for protection dummies of equation (1).

Figure 7. Estimated monthly impact of AD measures on the Chinese export quantity to India at the HS 6-digit product level



Source: Authors' estimates based on UN Comtrade and Global Antidumping Database (Bown, 2012b).
 Note: Y-axis shows value of estimated coefficient for protection dummies of equation (1).

Institut de Recherches Économiques et Sociales
Université catholique de Louvain

Place Montesquieu, 3
1348 Louvain-la-Neuve, Belgique

