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The Trade Impact of Indian Antidumping Measures against China: Evidence from Monthly Data*

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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 article 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 article 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 article 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.

JEL: F13, F14, F52, G01

Keywords

Antidumping, China, crisis, India, monthly data, trade impact, trade policy, WTO

* Any views and opinions expressed in this article are those of the authors and not necessarily those of the institutions they are affiliated with.

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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, the 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 per cent in the early 1990s to 1.7 per cent in 2000 and 5.5 per cent 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 US\$ 50 billion from China. This corresponds to an increase of the Chinese share in the Indian import value from 0.1 per cent in 1990 to 2.8 per cent in 2000 and 12 per cent in 2011.¹

In the past few years, several high-level government meetings have taken 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 four cases against India, India has initiated 147 cases against China, of which 120 ended with the imposition of measures against Chinese producers.³ In relative terms, this corresponds to 22.4 per cent of all Indian AD initiations and 25.1 per cent 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 is 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',⁴ and if, additionally, dumping causes or threatens material injury to the domestic producers, then the domestic industry can file for AD protection. Article VI of the GATT and the AD Agreement stipulate that the government can then impose protection, which usually comes along with the introduction of an AD tariff on the 'dumped' imports that are imported from the producers in the target country under investigation.⁵

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 policymakers 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 come 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.⁶ 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 in the case of India. Using detailed product-level data, she finds that about 4 per cent of products were 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 raised its level of protection in 2008 and 2009 by not removing AD barriers that were actually supposed to be removed.⁷ Also, more recent evidence by Bown (2012a) shows that the group of G20 emerging economies, which India is part of, has increased its level of protection in 2011 as compared to 2007.

The purpose of this article is two-fold. 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 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 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 United Nations (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 (2010, p. 151) 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 article 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.⁸ 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 that we identify is less likely to be blurred by other factors influencing trade.

The remainder of the article is organized as follows. In the next section, 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. The following section introduces the data and the methodology

that are used in the empirical analysis. The penultimate section presents and discusses our findings regarding the impact of Indian AD policy against China on Chinese exports to India. The last section concludes.

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 couple of decades, exhibiting economic growth rates that have surpassed those of many others economies in the region. The annual average gross domestic product (GDP) growth rate of China has been 10.6 per cent over the last decade with double-digit growth rates in almost all years; India too has grown at a fast pace with an average growth rate of 7.8 per cent in the same period.

Figure 1 shows GDP growth rates as reported by the International Monetary Fund (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 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 per cent, 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,

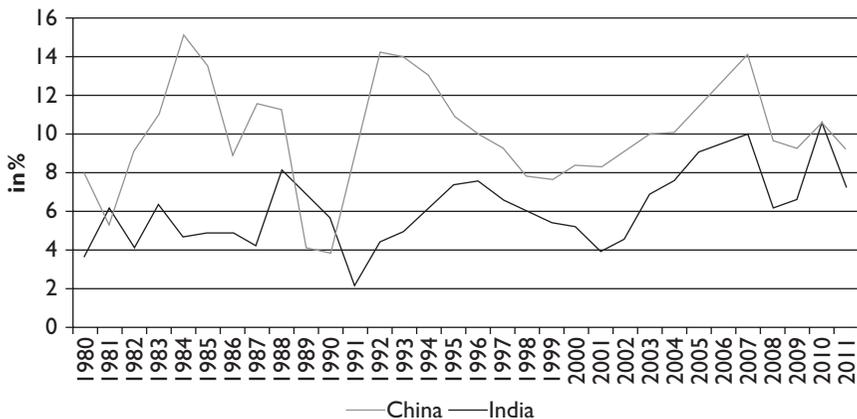


Figure 1. Annual GDP Growth of India and China

Source: International Monetary Fund (IMF) World Economic Outlook, April 2012 (<http://www.imf.org/external/ns/cs.aspx?id=28>).

with China and India reaching growth rates of 9.2 per cent and 7.2 per cent, respectively.

More recently, quarterly GDP growth numbers for India in 2012 have fallen to rates between 5–6 per cent, attracting the world's attention and triggering the IMF to call for a wide range of structural reforms in India.⁹ Given the counter-cyclical-ity with which AD policy has typically been applied in the past (see, for example, Knetter and Prusa, 2003), 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 restraint when it comes to trade policy if these results are taken literally.

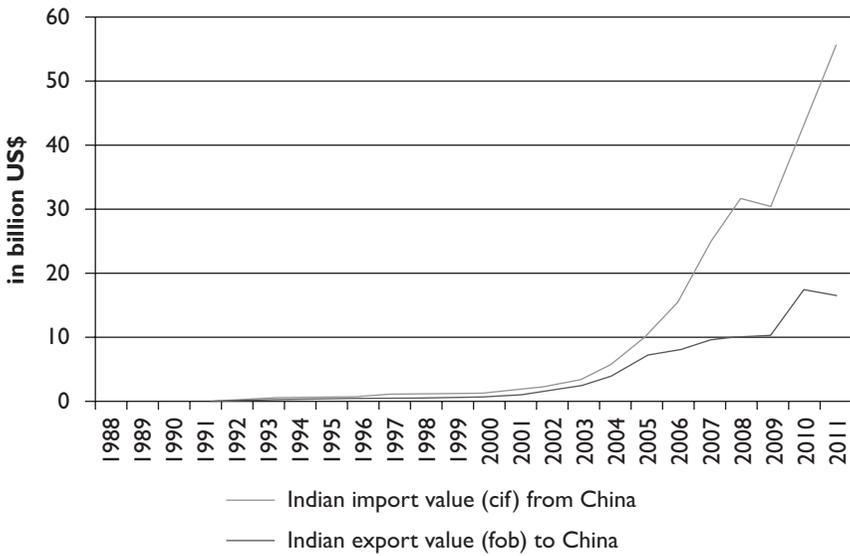
Besides revealing recent trends in GDP growth in both countries, Figure 1 illustrates the co-movements of Chinese and Indian GDP growth since the 1980s. Indian and Chinese GDP growth evolved quite differently before 1991, the year in which trade started to be liberalized in India as a consequence of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

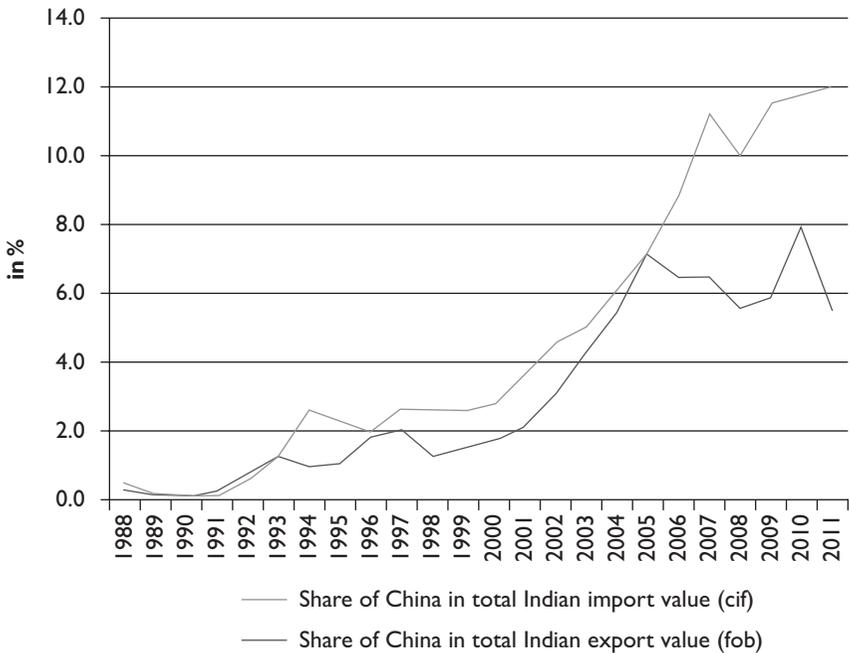
Figure 2 shows in panel (a), the export value of India to China and the import value of India from China. In 'fob' terms, Indian goods exports to China have reached a level of around US\$ 17 billion in 2011, steadily increasing from 1988 to 2010 and slightly declining in 2011. The value of Indian imports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

Since the increase of trade flows from and to India is a trend that can also be observed 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 1991, these have increased to 12 per cent for the import value and 5.5 per cent for the export value in 2011.

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.



(a) Absolute Value



(b) Share in Total Value

Figure 2. Indian Goods Imports from China and Goods Exports to China

Source: Authors' calculations based on UN Comtrade database.

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 Divided by 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 database.

As shown in Table 1, imports from China are concentrated in relatively few sectors. Particularly eye-catching is that machinery, the sector in which India imports most of its goods, has gained much importance, accounting for more than 40 per cent of imports from China in 2011. Although it was already the most important sector in terms of import value in 2001, the share was considerably lower at that time with a value of 23.4 per cent. India also imports many chemical products, which accounted for the second largest share of imports in 2011 reaching 16 per cent. The base metals sector is the third largest sector in terms of import value from China with a share of 8.6 per cent 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 per cent of the total import value was created by mineral products in 2001, this share declined to 3 per cent in 2011.

Textiles experienced a similar decline from 11.9 per cent in 2001 to 3.9 per cent 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.

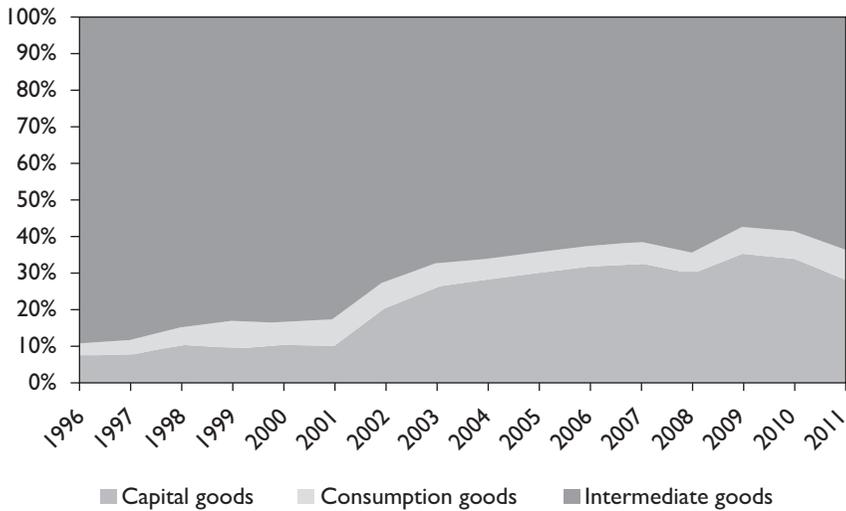
The values of this index, calculated as just described, are shown on the right-hand side of Table 1. A value of one for a certain sector corresponds to a situation in which the weight of this sector in the Chinese import value is exactly equal to the weight of this sector in the value of imports from 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 especially is dominant relative to other countries, especially in the footwear industry that accounts 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.

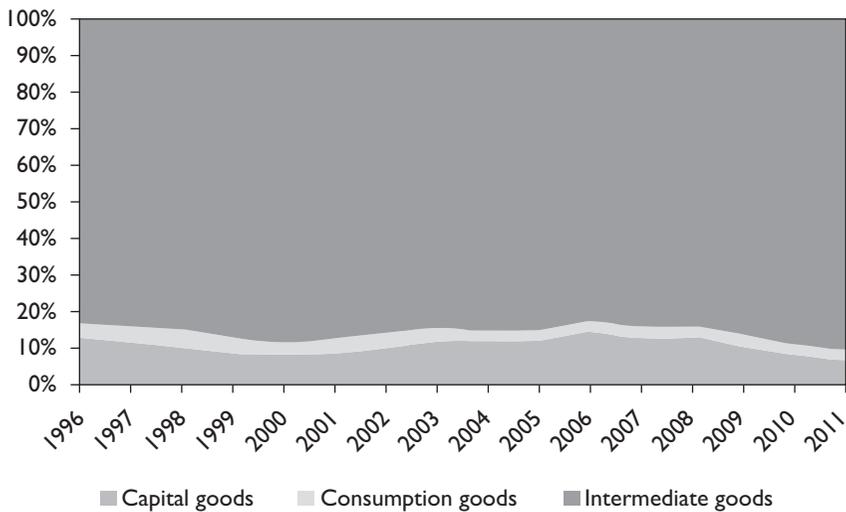
In Figure 3, we split up the Indian import value by type of product on the basis of the Broad Economic Categories (BEC) classification, distinguishing between consumption goods, intermediate goods and capital goods. We again do a separate analysis of imports coming from China and from the rest of the world, respectively. Interestingly, we find that the share of capital goods has increased in Chinese imports from 7.6 per cent in 1996 to 28.4 per cent 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 per cent of the import value from China. This is less than the 90.3 per cent 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 are produced domestically rather than imported.

Indian AD 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



(a) Imports from China



(b) Imports from All Countries except China

Figure 3. Distribution of Indian Import Value by Type of Product

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

initiated its first AD case against China on Isobutyl Benzene, imposing a specific duty for five years from 1995 to 2000. On the whole, 147 AD cases were initiated against China, which is roughly 23 per cent 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 much of the 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 per cent of the Chinese import value has been under AD protection. In 2009, it was even more than 16 per cent 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 per cent. 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 per cent and 3.5 per cent within the last 10 years.¹⁰ The fact that Chinese import shares under AD are much higher illustrates the Indian focus on China as AD target.

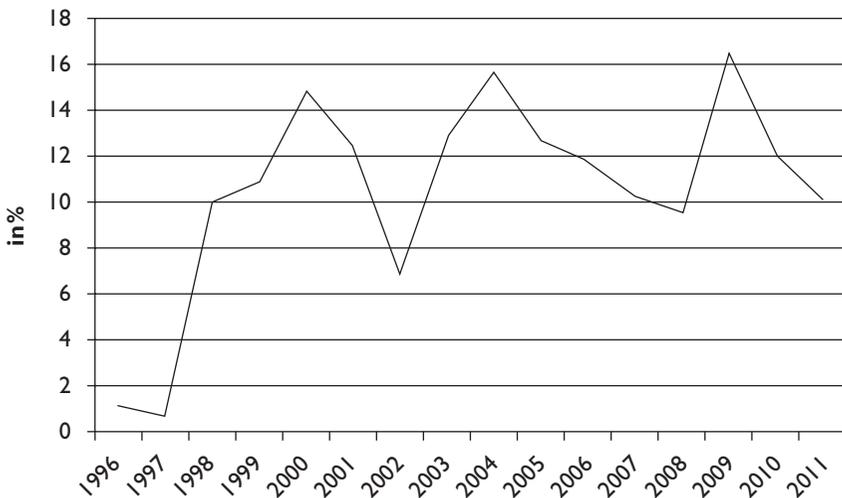


Figure 4. Share of Import Value from China under AD Measures

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

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 (EU), we shade for each sector and year the corresponding cell in the table according to the degree of AD coverage. The darker the shaded 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. 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 2 shows that Indian AD policy has been applied against China in 12 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 itself,¹¹ Table 2 shows that AD protection of India against China has, in fact, become the rule in some sectors.

Heavily protected from dumping, in particular, is the food and beverages sector with, in some years, more than 70 per cent of the import value under AD protection. In 2011, this share decreased to 33 per cent, 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 in Table 1. Also, textiles and plastics and rubber are prominent sectors for Indian AD policy against China with currently around 27 per cent 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 Indian AD rulings also play in the chemicals sector with 16 per cent of the import value placed under AD measures. Mineral products have been prominent in Indian AD rulings until 2009.

Our analysis demonstrates that AD also plays an important role 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

Figure 5 follows Vandenbussche and Viegelaan (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 per cent covered since 2003. 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

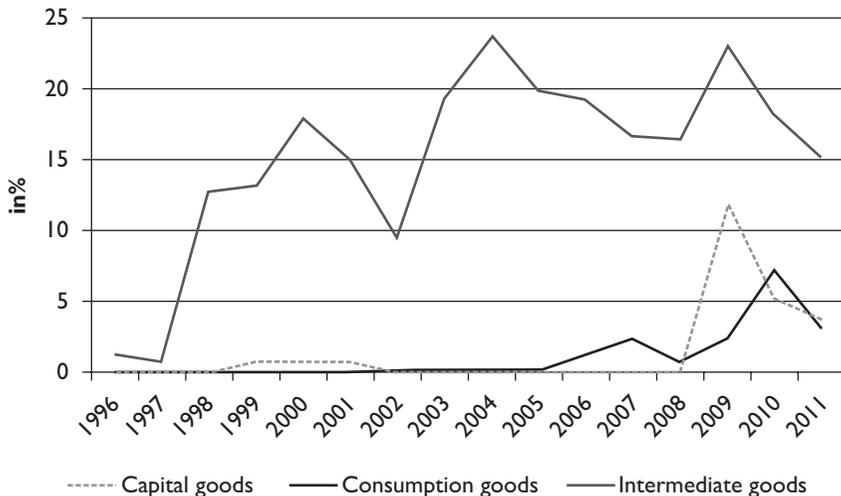


Figure 5. Share of Import Value from China under AD Measures, by Type of Product

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

of consumption and capital goods covered by AD seems to be a new trend in Indian AD policy which has been prevalent at least during the last three years.

Trade Impact of AD Measures: Data and Methodology

Having provided in 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 article 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 provides an overview of the 14 Indian AD cases against China that have been 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. These are sectors that also figure prominently in Indian AD policy in the years before 2009, which becomes apparent from Table 2. Furthermore, the 48 products involve intermediate products as well as consumption and capital goods. We believe that the 14 AD cases on 48 products provide a fairly representative sample of Indian AD policy against China.

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 2010. 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 Poisson Pseudo Maximum Likelihood (PPML) estimator with fixed effects. This estimator takes into account one of the basic problems that a researcher is confronted with when modelling 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 a standard ordinary least squares (OLS)-based estimation methodology, all observations with zero trade would drop out of our estimation sample, not entering our

Table 3. Indian AD Cases against China, Initiated in 2009–10

Product	Date of Initiation	Number of HS Products	Outcome
Viscose staple fibre excluding bamboo fibre	19 March 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 August 2009	1	Specific duty
Polyvinyl chloride paste resin (PVC paste resin)	3 November 2009	2	Duty if price falls under given level
Sodium tripoly phosphate (STPP)	5 November 2009	1	Specific duty
Certain glass fibres and articles thereof	8 January 2010	8	Ad valorem duty
PVC flex films	1 February 2010	5	Specific duty
Sewing machine needles	19 May 2010	1	Specific duty
Paranitroaniline (PNA)	8 June 2010	1	Specific duty
Opal glassware	26 August 2010	10	Ad valorem duty
Morpholine	7 December 2010	1	Specific duty
Geogrid/geostrips/geostraps made of polyester or glass fiber in all its forms (including all widths and lengths)	20 December 2010	13	Specific duty

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

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:

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

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.

$PR_{1,it}$, $PR_{2,it}$, ..., $PR_{n,it}$ 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 1 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.

Trade Impact of AD 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 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 per cent 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

Table 4. Poisson Pseudo 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* (0.0896)
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)	

(Table 4 continued)

(Table 4 continued)

	Dependent Variable: Export Value	
	(1)	(2)
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	1,316	1,316

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

Notes: ***, ** and * denote significance at the 1, 5 and 10 per cent level, respectively.

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 per cent 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-dimension,¹⁴ we find a clear pattern of a negative impact that immediately follows the imposition of the AD measure.

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 per cent 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 1 if the AD measure has been in place for more than six months is significant. Coefficients in between, despite not being significant, seem to generally fit well into the estimated pattern.

Figure 7, 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.

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 imposed on 3 of the 47 products that enter the regression an

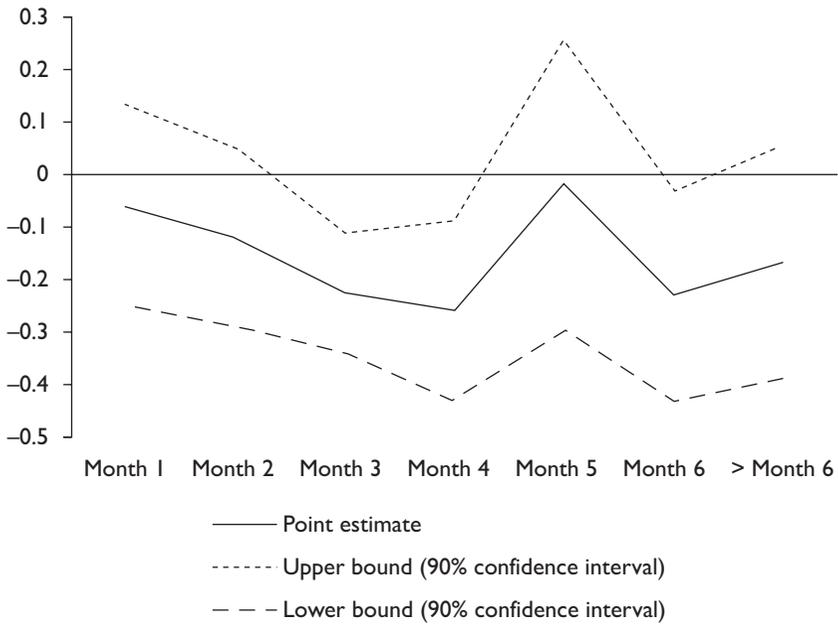


Figure 6. Estimated Monthly Impact of AD Measures on the Chinese Export Value to India at the HS 6-digit Product Level

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).

Table 5. Poisson Pseudo 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	
	(1)	(2)
AD protection		-0.27932* (0.150277)
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)	

(Table 5 continued)

(Table 5 continued)

	Dependent Variable: Export Quantity	
	(1)	(2)
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	1,260	1,260
Number of observations	45	45

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

Notes: ***, ** and * denote significance at the 1, 5 and 10 per cent level, respectively.

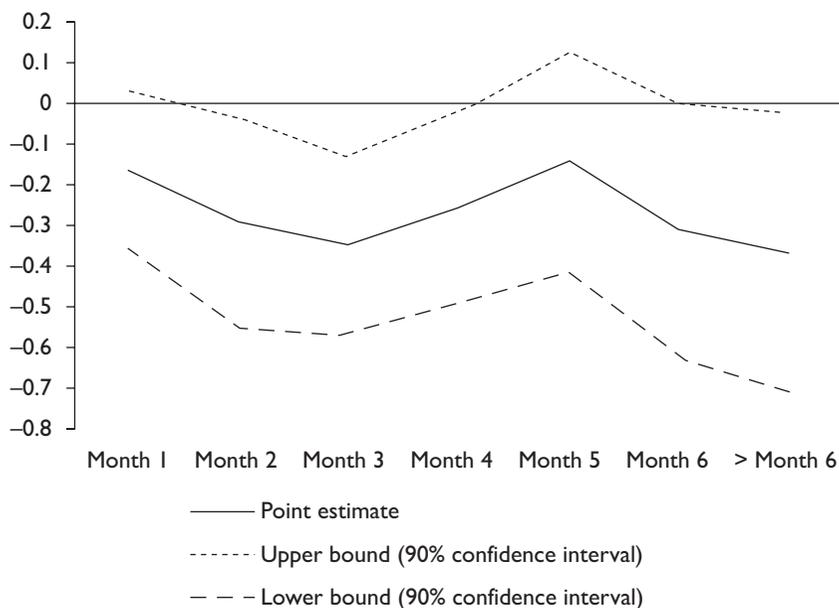


Figure 7. Estimated Monthly Impact of AD Measures on the Chinese Export Quantity to India at the HS 6-digit Product Level

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).

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 were 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.

Conclusion

This article 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 Indian imports from China and 18 in the case of Indian exports to China over the last decade, no other country is targeted with AD policy as often by its trading partner as China is by India.

In this article, we have shown several interesting facts about Indian imports from China. In particular, it seems that imports of machinery have gained much 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 capital goods especially have gained momentum in Indian imports from China.

AD policy is 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 per cent 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 article then takes the most recent Indian AD cases initiated against China 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 article is whether there is any import diversion occurring, that is, 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.

Notes

1. Author's calculations are based on trade data from the United Nations (UN) Comtrade database.
2. See newspaper article in *The Hindu* (2010), as example for Indian press coverage of one of the latest meetings covering AD issues between India and China.
3. These numbers are taken from the WTO (see http://www.wto.org/english/tratop_e/adp_e/adp_e.htm).
4. 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.
5. 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.
6. Besides AD measures, countervailing duties and safeguard measures also are trade protection measures that are labelled as 'temporary trade barriers'.
7. 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 reoccur in case the measure would be removed.
8. 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.
9. See Public Information Notice No. 12/36, 17 April 2012, IMF (<http://www.imf.org/external/np/sec/pn/2012/pn1236.htm>).
10. These numbers are implied by Figure 7.2 in Tovar (2011, p. 251).
11. See http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm8_e.htm
12. As discussed by Vandenbussche and Viegelah (2011), this indicator may, in fact, underestimate the 'true' economic importance of AD policy. As also shown in this article, trade flows are likely to be depressed as a 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.
13. See WTO/United Nations Conference on Trade and Development (UNCTAD) (2012) and Santos Silva and Tenreyro (2006) for a detailed discussion on the application of PPML in the context of modelling trade flows.
14. One product drops out of the regression since trade is perfectly explained with the product-specific fixed effect.

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