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This paper focuses on the displacement of other countries' exports by Chinese exports in the US clothing market during the 2002–2010 period (sector 62 of the Harmonized System). The main contribution is to consider individual product data and its dynamic for finding evidence of displacement. Data are for 13 countries, with balanced panels of 12 variables, 104 months, and 277 goods (08 digits). I find evidence of trade displacement for more than half of the sample, composed of developing and developed countries alike. There is evidence that Chinese exports displace other countries' exports in all three income groups, but clearly the most affected group is the middle-income group. For Mexico and Thailand, displacement is significant and the effect is large. Some low-income countries are also affected, particularly Sri Lanka. Data on Taiwan show a particularly interesting result, with a conjecture regarding disappearance of tariff arbitrage and re-exports of Chinese apparel to the USA through Taiwan. There is no evidence of displacement patterns changing due to quotas imposed by MFA and previous trade agreements.

Keywords: international trade; Chinese exports; displacement; multi-fiber arrangement; panel data; textile and clothing market

JEL classifications: F14; F16; O51; O53

1. Introduction

This paper analyzes the displacement effects that Chinese exports had in the US clothing market in the period 2002–2010 by considering a panel data specification in the HS08 product level. The econometric model builds on Greenaway, Mahabir, and Milner (2008) and Athukorala (2009). I contribute to the literature in two ways: first, by considering the effect of the end of the Agreement on Textile and Clothing in a favorable data scenario; and second, by analyzing trade dynamics through the usage of the whole range of 277 goods at 08 digits of the Harmonized System. I choose monthly data and the full range of products because they allow for a deeper understanding of trade dynamics.

In the trade literature, there is a growing trend that regards China as a country moving away from exploring comparative advantages and the production of purely labor-intensive goods to one producing in more capital-intensive sectors. On the one hand, constant trade restrictions and the process of Yuan appreciation should curb exports from China to the American market. Since as early as 1999, authors have been

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questioning the comparative advantages that China has in the textiles industry and pondering the proper policy responses to the declining importance of textiles and clothing in China's manufactured exports (Yang 1999). On the other hand, authors have cautioned that the elimination of the quotas in the Agreement on Textiles and Clothing (ATC) on 1 January 2005 would bring major changes (Martin 2007): a sharp increase in US clothing and textile imports, a major shift in sourcing clothing and textile imports to China and a deleterious effect on the US clothing and textile industry.

We see two conflicting trends: one in which Chinese exports would shift away from textiles and clothing production and thus lose relevance in the US market, and another in which Chinese exports would rise in value due to the end-of-trade restrictions.

I estimate panel data models for 13 countries (Bangladesh, Canada, the Dominican Republic, France, Indonesia, India, Italy, Mexico, Philippines, South Korea, Sri Lanka, Taiwan, and Thailand) in an attempt to find trade displacement effects influenced by Chinese exports in the American clothing market, by relating it to economic variables. Data range from 2002 to 2010 (104 months), 277 goods (08 digits) and 12 variables – totaling 345,696 data points for each of the 13 countries. Such a large data analysis has not been proposed in the literature before. We choose these 13 countries because, together with China, they comprise over 90% of US imports of textiles and clothing. The only omission is Vietnam, for which monthly data on some economic indicators are not available.

I find evidence of trade displacement for more than half of the sample, comprised of developing and developed countries alike. There is evidence that Chinese exports displace other countries' exports in all three income groups, but clearly the most affected group is the middle-income group. For the high-income group, traditional clothing exporting countries, like France and Italy, suffer no displacement. However, for Mexico and Thailand, displacement is significant and the effect is large. Some low-income countries are also affected, with special distinction given to Sri Lanka.

There is no compelling evidence that the quotas imposed by MFA and previous agreements are slowing down the increase of China's share in the American clothing market.

The rest of the paper is divided as follows: the second section presents empirical evidence on trade displacement; the third section narrates some background on the evolution of the American clothing market; the fourth section consists of the estimation strategy and results, and the last section provides final comments.

2. Empirical evidences of trade displacement

The last four decades can be characterized by many changes in the dynamics of international trade. Many countries, like China, have been opening their markets and increasing their share in the international market. One result has been the emergence of trade displacement, which can be summarized as a market share gain for one country at the expense of another's in the world market. Empirical analyses of Chinese exports abound in the literature (e.g. Fernald, Edison, and Loungani 1998; Ianchovichina and Martin 2001; Liu, Wang, and Wei 2001; Yue and Hua 2002; Ahearne et al. 2003; Srivastava and Rajan 2004; Bahmani-Oskooee and Ratha 2010; Bai, Ma, and Pan 2012), but, in the present work, we have directly built on Eichengreen, Rhee, and Tong (2007), Greenaway, Mahabir, and Milner (2008), and Freund and Ozden (2006).

Eichengreen, Rhee, and Tong (2007) analyzes the possible displacement effect of Chinese exports by using a gravity model based on bilateral trade flows. They consider

180 importing countries and 13 exporting Asian countries, with data from 1990 to 2003. Results show that China displaces other Asian countries' exports, and, with other things equal, a 10% increase in Chinese exports results in a 0.6% decline in competing Asian countries' sales in a particular market. Also, they show that Chinese exports displace other Asian countries' exports of consumer goods that are labor-intensive, but not their exports of intermediate goods.

Greenaway, Mahabir, and Milner (2008) also uses the gravity model to verify the effect of trade displacement caused by China on other Asian countries' exports. The data are from the period 1990 to 2003 and it comes from the IMF Direction of Trade Statistics. It represents bilateral trade flows among 170 importing countries and 13 Asian exporting countries. An analysis for the whole period (1990–2003) shows that Chinese exports do displace other Asian countries' exports in a third market. A 1% growth in Chinese exports displaces 0.07% of other Asian countries' exports. Greenaway, Mahabir, and Milner (2008) then divides the periods into two (1990–1996 and 1997–2003), with the resulting evidence that the trade displacement effect occurs only during the period ranging from 1996 to 2003, which is the period coinciding with a reduction in tariffs on Chinese exports. Further evidence reveals that China does not compete with other Asian countries in developing markets, but only in developed markets. The supporting argument for this evidence is simple: China shares similar comparative advantages with other developing countries. The final evidence presented by Greenaway, Mahabir, and Milner (2008) is that, among the three groups of Asian countries, displacement is higher in high-income countries (South Korea, Singapore, and Japan), which is probably the result of China moving production upwards in the international value chain.

Greenaway, Mahabir, and Milner (2008) show that the displacement effect is higher for high-income groups and light manufacturing industries, like clothing and textiles. They also show that China does not significantly affect the low-income group of Asian countries due to the similarity of their export products.

Freund and Ozden (2006) analyzes the effect of Chinese exports on Latin American and Caribbean (LAC) countries' exports in a third market. They use bilateral trade data at 4-digit SITC level, from 1985 to 2004, divided into two categories, non-industrial (raw material, minerals, etc.) and industrial (electronics, textile, apparel, etc.). Results show that Chinese exports mostly impact industrial goods exported by LAC countries. Evidence shows that the negative effect on LAC's exports is more evident than in other developing countries. They also divide their data into four periods – 1986–1989, 1990–1994, 1995–1999, and 2000–2004. The outcome is that the negative effect of Chinese exports on LAC`s exports is only shown in the last two periods. There is a strong impact of Chinese exports on exports of industrial goods to North America from Central America, the Caribbean, and Mexico for the period of 1995–2004, and Mexican exports are the most affected. The authors also analyze 70 products (02 digits), 14 of which we see trade displacement effects by Chinese exports. The textile sector is significantly affected by China in the later periods, while clothing exports are negatively influenced in the first period, suggesting that China does not displace LAC`s exports of apparel.

3. Stylized facts on American clothing imports

Over the past 50 years, successive trade agreements have been protecting the textile and clothing industries of developed countries. Recently, however, countries have chosen to

eliminate quota restrictions under the ATC, which ended on 1 January 2005. Even though non-trade barriers can still be used to limit imports from selected countries, the barriers from the ATC were considerable and worked to limit trade (tariffs peaked at 113.5% for some products in the clothing industries). After 2005, there were no surging imports even when the quotas were lifted – even though the global clothing and textile market started to grow faster, there was no sharp shift of production in China (Martin 2007).

I now turn to US clothing market data, which come from USA Trade Online (2010, http://www.usatradeonline.gov/). The analysis focuses on the case of US clothing imports (sector 62 of the Harmonized System) in the 2002–2010 period. The data are from 08-digit products in the Harmonized System 2002, and have been collected on a monthly basis from January 2002 to August 2010. The trade data comprising of 117 months is a huge departure from the annual data used in other studies. The rest of the data come from ISI Emerging Markets.

There are 280 products by 08-digit classification of HS in this chapter. During the period of the analysis, 2002–2010, monthly imports do not present significant growth. In fact, monthly imports in 2009 are the same, in nominal terms, as in 2002, and even at its peak between 2005 and 2007, they are only 20% higher than in 2002 (Figure 1).

This relative stability means that competition in the clothing market is one in which export growth for one country comes from the diminishing market share of other countries – the size of the whole market is not growing significantly. Figures 2–4 shows different market shares of selected countries in the US clothing market during the 2002–2010 period. In Figure 2, we have countries from Asia, in Figure 3, Central American countries and, in Figure 4, China, and Mexico.

We can divide Asian countries into winners and losers in terms of their market share in the US clothing market. The first group is comprised of Bangladesh, Vietnam, Indonesia, and India. In 2002, the combined market share of these countries was 15.6%, while in the third quarter of 2010, it was 24.4%. The second group encompasses the Philippines, Sri Lanka, Thailand, and Taiwan, which had a combined 11.9% of the US clothing imports market in 2002 and only 4.5% in 2010.

The figure from the countries in Central America is very different, as we can see in Figure 3. All countries from the region lost expansive market share during the 2002–2010 period. In fact, these countries accounted for an average of 12.4% of US clothing imports in 2002 and only 4.5% in 2010. For some countries, the process of

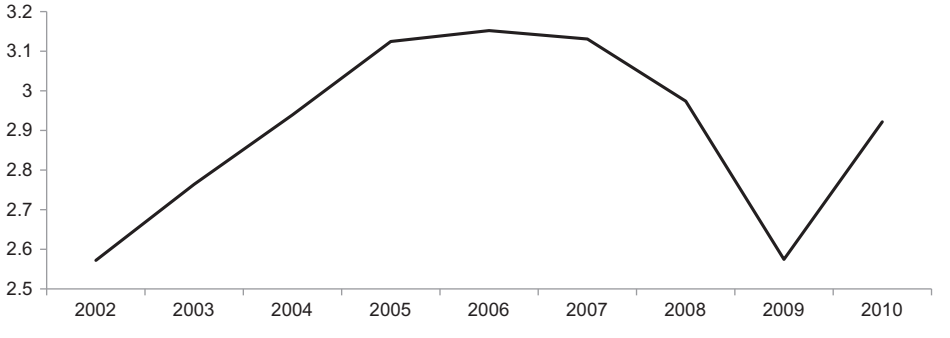

Figure 1. Average US monthly clothing imports – US$ billion.
Source: USA Trade Data Online (2010, http://www.usatradeonline.gov/).

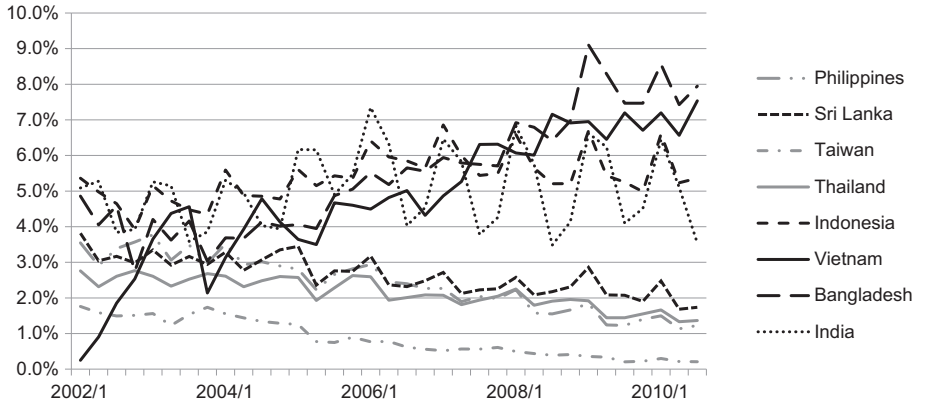

Figure 2. Evolution of market share in the US clothing imports market – selected Asian countries – 2002/2010.
Source: USA Trade Data Online (2010, http://www.usatradeonline.gov/).

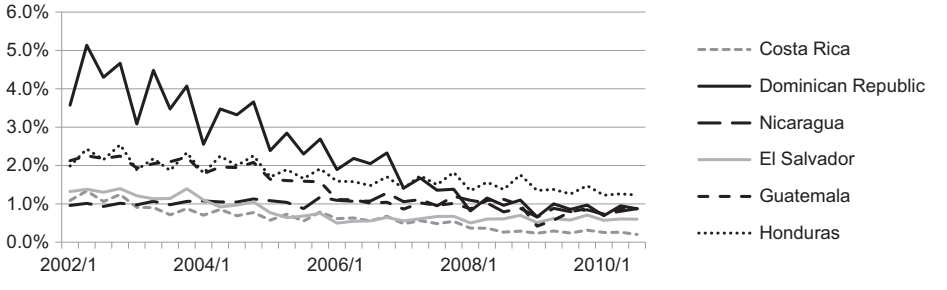

Figure 3. Evolution of market share in the US clothing imports market – selected Central America countries – 2002/2010.
Source: USA Trade Data Online (2010, http://www.usatradeonline.gov/), elaborated by the authors.

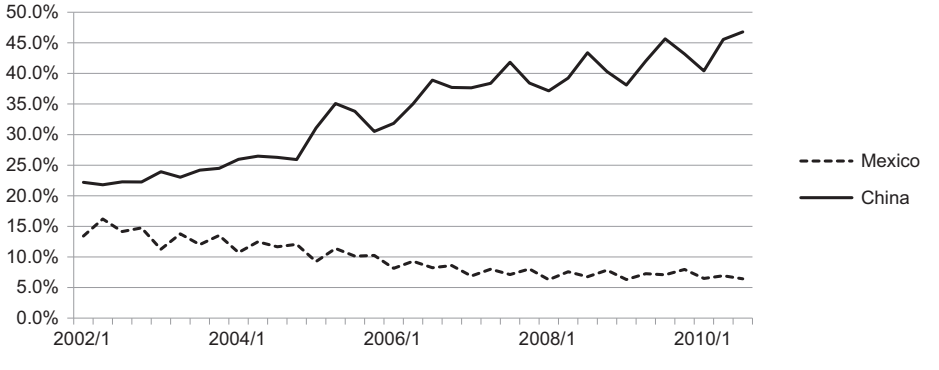

Figure 4. Evolution of market share in the US clothing imports market – Mexico and China – 2002/2010.
Source: USA Trade Data Online (2010, http://www.usatradeonline.gov/).

losing market share has accelerated after the phasing out of the quotas, while for others, like the Dominican Republic, the trend emerges earlier. In any case, there is a clear picture of lost relevance for Central American countries in the US clothing market.

The biggest shifts, in terms of market share, come from China and Mexico, as we can see in Figure 4. China's market share jumps from 22% in 2002 to 46.8% in the third quarter of 2010. The growth picks up steam after the end of the ATC agreement; since 2005, China has accounted for 31% of US clothing exports. Martin (2007) points out two possibilities for this increase in Chinese market share after the end of the ATC – sharp increase in clothing and textile imports to the USA from China and a major shift in sourcing clothing and textile imports from China. While there is no strong argument for the first (the average nominal monthly Chinese clothing exports grew from U$850 million in 2002 to U$1.28 billion in 2010, a 6% annual nominal growth), there is clearly a good argument for the second. In a stagnant American market, Chinese exports now account for almost half of the US clothing imports. In fact, the market share of the selected Asian countries from Figures 1 and 4 is over 75%. There is clearly a trend of market concentration which starts before the end of the ATC agreement and continues throughout 2010.

There is one important caveat though. When the whole sector is considered, the verified trends do not necessarily hold for all clothing products. The dynamics of the sector are complex, and we may be seeing, alongside the concentration process, a reorganization process with underlying specialization for countries that cannot compete in all export markets with China. For instance, Mexican exports of men's or boys' overcoats, cloaks etc. (6201) increase over time, while Mexican exports of men's or boys' undershirts (6207), women's or girls' slips (6208), and bras, girdles, and garters (6212), have been all but thrown out of the US market during the 2002–2010 period, in the last case going from a share of 13.6% in 2002 to 0.7% in 2010. Now we proceed to explicitly test for displacement.

4. Measuring trade displacement on the American clothing market

4.1. The econometric model

The idea of the econometric model is to verify if China is indeed displacing exports from selected countries in the US clothing market. Following Greenaway, Mahabir, and Milner (2008) and Athukorala (2009), the variables of the econometric model for testing are (some variables were dropped due to statistical insignificance and relative irrelevance in the estimation process): US Imports from each country for each product *j,* real GDP of each country, distance between countries, a binary variable for the ATC being in effect, and control variables related to costs. The cost controls are (all in log differences): wages, textile machineries, raw materials, interest rate, exchange rate, and price producer index.

As in Greenaway, Mahabir, and Milner (2008) and Athukorala (2009), we use panel estimation instead of the instrumental variables technique employed by the authors because Chinese exports are exogenous to the US market in our case. We truncate the data to avoid the zero issue problem prevalent in gravity equations.

The main difference between the present approach and Greenaway, Mahabir, and Milner (2008) and Athukorala (2009) is that I consider each 08 digits heading. By focusing on individual products, I aim to analyze trade dynamics that get captured only in the aggregate when using regular chapter data. The final model (considering all goods in chapter 62) is then:

$$\ln \mathrm{US}_{it} = \beta_0 + \beta_1 \ln \mathrm{CnX}_t + \beta_2 \mathrm{GDPUS}_t + \beta_3 \mathrm{GDPX}_t + \beta_3 \mathrm{GDPCn}_t + \beta_4 \mathrm{Dist}_{ij} + \beta_5 W_{it} + \beta_6 \mathrm{Exc}_{it} + \beta_7 \mathrm{RM}_{it} + \beta_8 \mathrm{IR}_{it} + \beta_9 \mathrm{Mac}_{it} + \beta_{10} \mathrm{ATC}_t + \varepsilon_{it}. \quad (1)$$

In which: US: imports of the US from country *i*; CnX: Chinese exports to the US; GDPUS: gross domestic product of US; GDPX: gross domestic product of exporter; GDPCn: gross domestic product of China; Dist: ratio between the distance of country *i* and China to the US; *W*: difference, in log, between the increases in wages between country *i* and China; Exc: difference, in log, between the increases in exchange rates between country *i* and China; RM: difference, in log, between the increases in textile raw materials between country *i* and China; IR: difference, in log, between the increases in interest rate between country *i* and China; PPI: difference, in log, between the increases in PPI between country *i* and China; ATC: binary variable that assumes value 0 while the ATC was in place and value 1 otherwise.

Countries are those that comprise the biggest competitors of China exporting to the US market and for which data are available: Bangladesh, Canada, the Dominican Republic, France, Indonesia, India, Italy, Mexico, the Philippines, South Korea, Sri Lanka, Taiwan, and Thailand. Alongside China, these countries represent over 95% of US clothing imports in the whole sample. It is interesting to note that competition in this market is not only from developing countries, but also from developed countries such as France, Italy, and South Korea. The differentiated nature of the market makes results for the displacement equation unpredictable. The only notable omission is Vietnam, for which data is not available for some economic indicators.

The result is a balanced panel of 12 variables, 104 months, and 277 sub-headings (08 digits), totaling 345,696 non-truncated data points for each of the 13 countries.

The idea behind each estimation is to capture the displacement effect through a product-fixed effect estimation that captures trade dynamics. The Haussman test indicates that the fixed effect is the adequate model in the present case, even though later, I present results with consideration of time-effects for robustness check.

Another difference between the present work and Greenaway, Mahabir, and Milner (2008) is that while they test a gravity model equation, here the main factors affecting trade displacement in Equation (1) are related to economic variables. Also, I focus on trade dynamics, and the effect of intrasectoral displacement. The main idea is that the variables affecting exporting firms in other countries competing with China vary over time according to the differences in economic environments. Therefore, the present study explores these differences by building variables related to production costs, growth, and macroeconomic variables. Also, by focusing on individual goods, the estimation results measure the average displacement not at the aggregate level but at the product level, which is a much more precise way to find indication of displacement. The main hypothesis, though, is whether Chinese exports influence other countries' exports of clothing to the US. This hypothesis is captured by the variable CnX. It should be expected that if Chinese exports have an influence on trade displacement, this variable should be statistically significant and negative in value.

For the GDP variables, one should expect that both the growth in US GDP and the export GDP have a positive effect on the local export sector. Chinese growth, however, should have a negative or irrelevant effect on the countries' clothing exports to the USA. As in Greenaway, Mahabir, and Milner (2008), distance should be negatively correlated with exports to the US market, as should cost variables such as relative local wages, interest rates, raw material, and the price producer index. The relative exchange

rate should have a positive impact, as currency devaluations help exporters, while the end of the ATC should have a negative impact on the countries' exports due to higher intensity of competition from China.

The econometric specification also allows for intrasector dynamics, which is impossible to see in aggregated and annual data. Competition among countries happens in terms of products, not sectors. By looking at individual products, we can see if Chinese exports displace other countries' exports due to product competition. After all, if one looks at the aggregated data, there is a possibility that Chinese exports in one product are growing while other countries' exports in another product are diminishing. Results would show displacement when none exists. By looking at product competition, we can see displacement at the product and not the industry level.

4.2. Results

From Table 1, we can find evidence of trade displacement for more than half of the sample, comprising of developing and developed countries alike.

In fact, the countries in which there is no evidence are: Bangladesh, France, India, and Italy. Among the countries displaced by China, Thailand is the most affected by China`s exports and the Philippines is the least affected. For Canada, results from the regression suggest that a 1% increase in Chinese exports displace 0.06% of Canadian exports, which is small but still surprising, because Canada is usually not associated as a competitor of China in the international clothing market. However, for the American market, geography may play a role. There is also evidence of small displacement of exports from the Phillippines (0.02%). For other countries, the displacement effects are larger: the Dominican Republic (0.31%); Indonesia (0.37%); For Sri Lanka (0.68%); South Korea (0.69%); and Mexico (0.82%). For these three countries, the results indicate that the loss of market share in the American market is due to competition from China.

The two extreme cases are Taiwan and Thailand. A 1% increase in Chinese exports displaces 1.3% and 2.7% of exports between Taiwan and Thailand, respectively. Taiwan's case is an interesting one. In the trade literature, tariff evasion and trade diversion through re-exports, which is made possible by tariff arbitrage, can explain missing Chinese trade data (Rotunno and Vézina 2012; Rotunno, Vézina, and Wang 2013). In the first case, Chinese networks would be exploiting a market failure in which tariff costs would be lower if they follow a China–Taiwan–US export route rather than the regular Chinese export route to the USA. Given the tariff advantages of exporting apparel through Taiwan rather than directly from China before the end of the MFA, part of the large effect seen in our data are related to the sudden appearance of missing Chinese exports in Chinese data, with a corresponding decline in exports from Taiwan due to fewer opportunities in tariff arbitrage. Even if Chinese networks appropriated relatively small gains from this tariff arbitrage, given that Taiwan has a share of less than 2% of the American market, and that the country lacks comparative advantages in the industry, a shift from informal to formal markets would result in marked effects on trade data. In the second case, the results for Taiwan would be in line with trade diversion between China and Africa, in which African exports to the USA (more precisely, mere re-exports) rose before the end of the MFA and declined afterwards (Rotunno, Vézina, and Wang 2013). Unfortunately, I do not have the data to formally test this conjecture, but regardless of the cause – Chinese networks or disappearance of re-exports – the strong results for Taiwan can be easily explained with the end of the

Table 1. Summary of the results for the displacement effect model.

	Variables	CnX	GDPUS	GDPX	GDPCn	Dist	*W*	Exc	IR	RM	PPI	ATC
Bangladesh	Coef.	−0.068	0.104	0.684*	−1.150	−0.065	−0.017	0.018	−0.197	0.037	0.131	0.001
	Std.Err.	0.187	0.163	0.187	0.744	0.116	0.026	0.055	0.233	0.023	0.096	0.003
Canada	Coef.	−0.063**	0.409*	0.019	−0.004	−0.254	−0.183*	0.000	0.074	−0.032*	−0.003	0.001**
	Std.Err.	0.035	0.045	0.031	0.004	0.161	0.055	0.006	0.079	0.014	0.031	0.000
Dominican Republic	Coef.	−0.313*	0.386*	0.061	−0.111	0.185	−0.291	0.261*	−0.122**	−0.083	−0.005	−0.007*
	Std.Err.	0.113	0.123	0.117	0.069	0.265	0.187	0.107	0.064	0.153	0.015	0.002
France	Coef.	0.045	0.061	0.059	−0.026	−0.269*	−0.011	−0.017	0.059	−0.242	0.012	0.004
	Std.Err.	0.211	0.064	0.077	0.114	0.123	0.013	0.011	0.081	0.196	0.013	0.001
Indonesia	Coef.	−0.374*	−0.018	0.854*	−0.480**	−0.001	0.015	0.007	0.029	−0.044	−0.020	0.006*
	Std.Err.	0.126	0.022	0.294	0.277	0.008	0.059	0.012	0.354	0.159	0.024	0.001
India	Coef.	−0.064	−0.010	0.100*	−0.027	0.024	0.006	0.001*	0.023	−0.046	0.004	0.002*
	Std.Err.	0.075	0.021	0.025	0.094	0.048	0.011	0.000	0.019	0.031	0.014	0.000
Italy	Coef.	−0.964	1.381	4.327	2.037	0.259	0.061*	0.225	−0.428	−0.551	−0.707*	−0.032**
	Std.Err.	0.812	0.854	2.628	1.184	0.231	0.021	0.180	0.659	0.415	0.288	0.017
Mexico	Coef.	−0.829*	2.111*	−0.033	0.006**	−0.069	0.438*	0.239	−0.124	0.384*	−0.023	−0.004
	Std.Err.	0.366	0.516	0.059	0.003	0.189	0.197	0.219	0.175	0.187	0.438	0.004
Phillipines	Coef.	−0.023*	0.144*	−0.001	0.024	0.034	0.020	0.034	−0.018	−0.033	−0.041	0.003*
	Std.Err.	0.011	0.051	0.001	0.023	0.044	0.018	0.040	0.035	0.042	0.017	0.001
South Korea	Coef.	−0.699*	−0.111	0.814*	−0.051	−0.016	−0.354	0.010	−0.796*	0.155	0.862	−0.001
	Std.Err.	0.131	0.146	0.258	0.053	0.153	0.351	0.044	0.240	0.257	0.659	0.001
Sri Lanka	Coef.	−0.684*	0.104	0.068	1.150	−0.065	−0.017	0.018	−0.197	0.037	0.131	0.001
	Std.Err.	0.187	0.163	0.187	0.744	0.116	0.026	0.055	0.233	0.023	0.096	0.003

(*Continued*)

Table 1. (*Continued*).

	Variables	CnX	GDPUS	GDPX	GDPCn	Dist	*W*	Exc	IR	RM	PPI	ATC
Taiwan	Coef.	−1.341**	0.501**	0.027	0.166	−1.080	3.429	2.849*	−0.001	0.389	−0.047	−0.005
	Std.Err.	0.802	0.254	0.175	0.722	0.906	2.585	1.245	0.090	0.610	0.076	0.009
Thailand	Coef.	−2.704*	0.285**	−0.037	1.646*	−0.084	0.061	−0.019	0.001	0.057	−0.205	−0.003**
	Std.Err.	0.409	0.160	0.023	0.715	0.150	0.296	0.068	0.007	0.039	0.168	0.002

Notes: The model is a panel data fixed effect. Period ranges from 2002 to 2010, 104 months in total, for each product of the clothing sector (277 in total, from the 62 section of the Harmonized System of trade classification data). Dependent variable is US: Import of the US from country *i*. Independent variables are (all in log as well); CnX: Chinese exports to the US; GDPUS: gross domestic product of US; GDPX: gross domestic product of Exporter country; GDPCn: gross domestic product of China; Dist: ratio between the distance of country *i* and China to the US; *W*: difference, in log, between the increases in wages between country *i* and China; Exc: difference, in log, between the increases in exchange rates between country *i* and China; RM: difference, in log, between the increases in textile raw materials between country *i* and China; IR: difference, in log, between the increases in interest rate between country *i* and China; PPI: difference, in log, between the increases in PPI between country *i* and China; ATC: binary variable that assumes value 0 while the Agreement on Textiles and Clothing was in place and value 1 otherwise. The key variables are CnX and ATC. We can see the displacement effect on negative significant results from the first variable, while the second shows the relevance of the end of quotas of the Agreement on Textile and Clothing.

*Statistically significant at 5%.

**Statistically significant at 10%.

MFA and higher incentives in straight-up trade between China and the USA. Otherwise, the most remarkable result is Thailand. There is evidence that the phasing-out of the quota influenced the displacement effect caused by China, and it is not only the Chinese exports that seem to be growing at the expense of Thailand, but also China's GDP seems to be affected by the decrease of Thailand's exports to the USA.

Greenaway, Mahabir, and Milner (2008) divides the countries in three groups, but in their case, the analysis is limited to only Asian countries. Here, I divide the countries in the sample into three groups: high-income countries (Taiwan, South Korea, Italy, France, and Canada); middle-income (Mexico, Thailand, and the Dominican Republic); and low-income (Bangladesh, Indonesia, Sri Lanka, the Philippines, and India). There is evidence that China's exports displace other countries' exports in all three groups, but clearly the most affected group is the middle-income group. The traditional clothing exporting countries in the high-income group like France and Italy suffer no displacement, and the same goes with low-income countries as well. However, for Mexico and Thailand, the displacement effects are significant, and both countries lose a large market share in the American clothing market. These results are similar to Eichengreen, Rhee, and Tong (2007).

For the low-income group, three of the five countries are affected by Chinese exports, but large effects are only found in Indonesia and Sri Lanka.

Also, Freund and Ozden (2006) state that China does not displace LAC apparel exports because the apparel products exported by LAC are of different categories than those exported by China. However, for the two countries in our sample, we find evidence of trade displacement by Chinese exports. Thus, it seems that there is an overlap of the products produced by China and by Latin American countries in the American clothing market. Our result also differs from Athukorala's (2009), who posits that China's growth comes at the expense of other East Asian countries. In the present case, the displacement effect is spread-out. The caveat is that here, we are analyzing a single market. For France and Italy, there is no displacement effect. This is easy to explain: China and those countries simply do not compete in the same product markets. In our econometric specification, displacement can only happen at the product level.

There is no compelling evidence that the quotas imposed by MFA and previous agreements are slowing down the increase of China's share in the American clothing market. The variable ATC, representing the phasing-out of the quotas, is significant for six of the countries. However, for three of them, the variable does not posit the expected signal. Martin (2007) expects that the end of the ATC would bring a surge of Chinese exports. Although that does not happen in our results, the overall displacement effects of Chinese exports in the American clothing market are large. It seems that it is a continuous process in the period of the present analysis, rather than an outcome due to the end of the quotas. Chinese exports also displace exports from developed and developing countries.

As for the other explanatory variables, there is some evidence, as expected, that the GDP of the USA and that of the exporting country play an important role in the exporting of clothing to the American market. The other variables' results present no clear pattern, but the signs are mostly as expected.

4.3. Robustness checks

There are two other ways to explain for our trade dynamics other than Chinese export displacement in the American clothing market. One is that seasonality plays a role, and

Table 2. Summary of the robustness check for the displacement effect model with month fixed effects.

	Variables	CnX	GDPUS	GDPX	GDPCn	Dist	*W*	Exc	IR	RM	PPI	ATC
Bangladesh	Coef.	0.032	0.104	0.684*	−0.015	−0.265	−0.017	0.018	−0.297	0.137	0.031	−0.199
	Std.Err.	0.187	0.363	0.187	0.644	0.316	0.074	0.055	0.133	0.223	0.196	0.203
Canada	Coef.	−0.163	0.509	−0.181*	−0.204**	−0.154	−0.083	0.100	−0.126*	−0.032	0.097	−0.099
	Std.Err.	0.065	0.550	0.031	0.104	0.361	0.155	0.094	0.021	0.114	0.069	0.200
Dominican Republic	Coef.	−0.311	0.386*	0.061	−0.211	0.185	−0.291	0.261	−0.022	−0.083	−0.105	−0.107
	Std.Err.	0.313	0.023	0.217	0.269	0.365	0.187	0.207	0.264	0.253	0.115	0.102
France	Coef.	−0.055	0.061	0.159*	−0.126	−0.169	0.089	−0.217*	0.059	−0.342	0.112*	−0.096
	Std.Err.	0.311	0.064	0.023	0.114	0.123	−0.087	0.011	0.281	0.396	0.013	−0.099
Indonesia	Coef.	−0.474*	−0.018	0.154	−0.038	0.099	−0.185*	−0.093	0.129	−0.044	−0.020	0.006
	Std.Err.	0.126	0.022	0.494	0.177	0.108	0.059	0.212	0.254	0.359	0.224	0.011
India	Coef.	−0.164**	−0.01	0.029	−0.027	−0.176	−0.194*	0.101	0.123	−0.146*	0.004	0.002
	Std.Err.	0.075	0.221	0.025	0.690	0.522	0.089	0.121	0.219	0.069	0.114	0.021
Italy	Coef.	−0.864	1.281	1.127	0.387	0.059	−0.039**	0.025	−0.328	−0.751	−0.707*	0.068
	Std.Err.	0.912	0.754	1.528	1.184	0.331	0.021	0.180	0.859	0.515	0.388	−0.083
Mexico	Coef.	−0.729	2.011*	−0.033	0.106*	−0.069	0.338*	0.239	−0.224*	0.484*	−0.223	−0.104
	Std.Err.	0.566	0.516	0.259	0.033	0.089	0.097	0.119	0.075	0.187	0.638	0.204
Phillipines	Coef.	−0.023	0.044	0.099*	0.024	0.134	0.120	−0.166	−0.218	−0.133	0.059	−0.197**
	Std.Err.	0.111	0.051	0.011	0.123	0.244	0.218	0.140	0.235	0.242	0.117	−0.099
South Korea	Coef.	−0.192	−0.011	0.614*	0.049	−0.016	−0.554	−0.09	−0.796*	0.155	0.862	−0.201
	Std.Err.	0.131	0.346	0.258	0.153	0.353	0.551	0.144	0.140	0.357	0.659	0.201
Sri Lanka	Coef.	−0.784*	0.104	−0.032	0.115	0.035	−0.017	0.118	−0.197	−0.063*	−0.069	0.101
	Std.Err.	0.087	0.263	0.387	0.644	0.316	0.126	0.255	0.433	0.023	0.096	0.103
Taiwan	Coef.	−1.541	0.501**	−0.173	0.266	−1.08	0.348	0.649	−0.101	0.189	−0.247	−0.105
	Std.Err.	0.902	0.254	0.275	0.922	0.906	0.258	0.452	0.290	0.610	0.176	0.109

Thailand	Coef.	−1.904*	0.385	−0.137	0.746	−0.084	0.161	−0.019	−0.199	0.057	−0.305	−0.003
	Std.Err.	0.609	0.36	0.123	0.815	0.15	0.496	0.268	0.207	0.061	0.268	0.002

Notes: The model is a month fixed effect. Period ranges from 2002 to 2010, 104 months in total, for each product of the clothing sector (277 in total, from the 62 section of the Harmonized System of trade classification data). Dependent variable is US: Import of the US from country *i*. Independent variables are (all in log as well); CnX: Chinese exports to the US; GDPUS: gross domestic product of US; GDPX: gross domestic product of Exporter country; GDPCn: gross domestic product of China; Dist: ratio between the distance of country *i* and China to the US; *W*: difference, in log, between the increases in wages between country *i* and China; Exc: difference, in log, between the increases in exchange rates between country *i* and China; RM: difference, in log, between the increases in textile raw materials between country *i* and China; IR: difference, in log, between the increases in interest rate between country *i* and China; PPI: difference, in log, between the increases in PPI between country *i* and China; ATC: binary variable that assumes value 0 while the Agreement on Textiles and Clothing was in place and value 1 otherwise. The key variables are CnX and ATC. We can see the displacement effect on negative significant results from the first variable, while the second shows the relevance of the end of quotas of the Agreement on Textile and Clothing.

*Statistically significant at 5%.

**Statistically significant at 10%.

the other is that displacement is a multicountry effect, not only the results of Chinese displacement. To test seasonality, I have added month fixed effects, but these have not improved the estimation. Results have changed a little but we have found less evidence of displacement. Our story is the same, but with less confidence in the patterns of displacement. Results are in Table 2.

I have also reestimated the models with aggregate data. I first used quarterly data, and then moved on to semi-annual data. Again, effects were weaker, as we have lost degrees of freedom and the underlying dynamics that explain the displacement effect of Chinese exports. I have omitted the results for brevity.

5. Final comments

Displacement in trade theory is usually a long-run phenomenon. Here, I show how it can happen in the short run by focusing on monthly US clothing imports during the 2002–2010 period (sector 62 of the Harmonized System). We show how, even if US imports of this particular sector are not growing steadily, China still gains a significant market share at the expense of many countries at the product level. My contribution to the literature hinges on an empirical analysis that allows for product dynamics in a very favorable data scenario. By estimating panel data models for each of the 13 countries in the sample, I have balanced panels of 12 variables, 104 months, and 277 goods (08 digits), totaling 345,696 data points for each of the 13 countries.

I find evidence of trade displacement for more than half of the sample, comprising of developing and developed countries alike. There is evidence that China's exports displace other countries' exports in all three income groups, but clearly the most affected group is the middle-income group. The traditional clothing exporters within the high-income group, like France and Italy, suffer no displacement. However, for Mexico and Thailand, displacement is significant and the effect large. Some low-income countries are also affected, namely Sri Lanka. I propose a conjecture regarding the strong results for Taiwan – that the displacement effect is attributed to the disappearance of the re-export of Chinese apparel through Taiwan given the lack of tariff arbitrage opportunities due to the end of the MFA. This result is in line with recent results by Rotunno and Vézina (2012) and Rotunno, Vézina, and Wang (2013).

There is no compelling evidence that the quotas imposed by MFA and previous agreements are slowing down the increase of China's share in the American clothing market. Reducing the quotas had no real impact on the trade flows in the American market.

Many avenues of research remain. Other sectors can be analyzed, and the estimation strategy can be enhanced by dynamical features. There is much empirical evidence to be gathered from microdata on international trade.

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