

Working paper

# Foreign market access and Chinese competition in India's textile and clothing industries

Impacts on firms and  
workers

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# **Foreign Market Access and Chinese Competition in India's Textile and Clothing Industries: Impacts on Firms and Workers**

August 2017

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## **Abstract**

We analyse the effects of the dismantling of import quotas under the Multifibre Agreement and China's subsequent entry into the WTO on Indian manufacturing firms. We combine these two quasi-natural experiments in order to disentangle the causal effects of new export opportunities to the EU markets from the effects of intensified export competition between Chinese and Indian manufacturers on the same market. Our empirical findings show little evidence for MFA quota removal affecting sales or other aggregate firm outcomes of Indian textile manufacturers. At the same time, we find some evidence for employment adjustment, with increased female employment in the formal sector and increased male employment in the informal sector as access to the EU market increased. We find no impact on Indian manufacturers of competition with China on the EU market.

## 1. Introduction

The integration of developing countries into the global economy has been one of the major global economic and social developments of the last decades and has further accelerated since the mid-1990s. Over the last 15 years, the share of developing countries in global export flows increased from 30% (in 1997) to about 45% (in 2012) (UNCTADSTAT 2014). While the empirical evidence on welfare effects of export opportunities has been accumulating, less is known about the effects of increasing competition among low-wage exporters.

India, the second most populous country in the world and highly abundant in low-skilled workers, provides an excellent case for analysing the impacts of South-South competition. Its textiles and clothing sector (from now on referred to as the textiles sector) plays a substantial economic role and accounted for 8.2% of Indian manufacturing value added in 2009 (WDI 2014). Given fierce global competition in the sector, cases of poor working conditions and low wages have become a symbol for the downside of globalization, spurring much public debate.

This study focuses on the effects of EU market access and increasing export competition from Chinese firms on Indian manufacturers operating in the textiles sector. For this purpose, we analyse the effects of two major changes in the global trade arena in the early 2000s: the dismantling of import quotas under the Multifibre Arrangement (MFA) and China's entry into the WTO. We combine these two quasi-natural experiments to disentangle the causal effects of new export opportunities to the EU from the effects of intensified export competition between China and India.

Prior research on impacts of Chinese competition has focused on firms in developed countries and in Latin America (e.g. Bloom et al. 2011, Utar 2014). For developing countries, existing firm level evidence on the effects of Chinese competition looks exclusively at firms in Latin America (Iacovone et al. 2013, Utar and Ruiz 2013). However,

in terms of low-skilled labour endowments and production technologies, as well as geographical and cultural distance from the EU, India is much more similar to China and therefore potentially more affected by Chinese competition.

Our empirical strategy allows us to disentangle the effects of increasing competition with Chinese producers from the effects of improved foreign market access for domestic producers or overall general equilibrium effects of liberalization (higher growth, etc.). Using China's WTO accession and the MFA quota abolishment, improved EU market access for Indian firms is measured by EU quota on Indian imports, while Chinese competition is measured by EU quota on Chinese imports. We estimate the impacts on firms in the formal sector, using firm level panel data, as well as the informal sector, using a synthetic panel created from repeated cross sectional data. The outcomes considered are total sales, assets, total employment and employment by gender, and the wage bill.

Our findings show no effects of quota removal on total sales, capital stocks, or the wage bill of Indian textile firms. We do see some impacts on employment, with increasing female employment in the formal sector and increasing male employment in the informal sector when EU binding import quotas get dismantled. Yet these impacts are difficult to align with the lack of impacts on other outcomes. When analysing the role of South-South competition, we find that EU quota on Chinese imports are not related to sales, employment, or earning in India's formal and informal sector. In all, we cannot conclude that improved EU market access or increased competition from China on the EU market led to significant adjustments among Indian textile and apparel producers.

## 2. Literature review

### 2.1 The policy context

The Multifibre Agreement (MFA) was signed in 1974 and allowed for selective import restrictions on textiles and clothing products with the objective to allow for short-term adjustment for textile producers in developed countries facing competition from

developing country producers. Under the MFA, most textiles exports from developing to developed countries were subject to import quotas, which turned out to last more than 20 years. Negotiations in the WTO Uruguay Round in 1994 resulted in the signing of the Agreement on Textiles and Clothing, which finally settled the dismantling of the MFA. Between 1995 and 2005, quotas on textile products were removed in four phases. In each phase, importers could choose for which product-groups to remove quotas, but the percentage of imports to be liberalized was fixed in the 1994 Agreement on Textiles and Clothing, as summarized in Table 1.

**Table 1: Schedule for dismantling MFA quotas**

| Phase | Date         | % Imports liberalized |
|-------|--------------|-----------------------|
| I     | January 1995 | 16%                   |
| II    | January 1998 | 17%                   |
| III   | January 2002 | 18%                   |
| IV    | January 2005 | 49%                   |

*Source:* Brambilla et al. (2010)

China became a member of the WTO in the middle of this process, in December 2001. With its WTO entry, textile exports of China were subject to immediate quota removals on product-groups that would have been liberalized between 1995 and 2002 (the first three phases of quota removals), while the remaining product groups would be liberalized in 2005. Therefore, in 2002 and 2005, India was faced with the removal of import quota on their own exports, but also on Chinese exports. As the timing of China's WTO entry was not well foreseen, this intensification of export competition was exogenous to the behaviour of Indian firms, allowing us to analyse the causal impact of export competition.

China's WTO membership boosted its rise to a major global economy, and not only increased competition from China in the North, but also intensified competition for developing countries on their traditional export markets. Due to the dismantling of the MFA, increased Chinese export competition was particularly salient in the textiles sector. Between 2000 and 2005, China's share of US and EU textiles imports doubled (increased by

123% in the US and by 98% in the EU, WITS 2014). In 2013, China accounted for 29% of global textile exports (WITS 2014).

## 2.2 Related literature

Standard trade theory predicts that improved access to export markets leads to an expansion of the affected industries in terms of output and production factors. Yet there can be considerable heterogeneity across firms within industries, so that certain effects are less likely to be observable at the aggregate sectoral level (Bernard et al. 2007). Firm level adjustments to liberalization include entry and exit, investments, and productivity growth (Melitz 2003), as well as quality upgrading, rising wages, and an increase in the skill-intensity of the workforce (Verhoogen 2008, Bustos 2011).

Recent empirical research on the effects of globalization has documented the presence of important adjustment mechanisms to trade liberalization (Bernard et al. 2012). Regarding import liberalization, the analyses of firms' adjustment to import tariff liberalization in India (Goldberg et al. 2010) and Indonesia (Amiti and Konings 2007, Amiti and Cameron 2012) show that import liberalization improved firm productivity especially due to a reduction in tariffs on intermediate inputs. Regarding access to export markets, Verhoogen (2008) shows that developing country firms will increase their wages and skill-intensity if export opportunities to rich countries improve. Juhn et al. (2014) show that improved access to the US market led to investments in new technology and to an increase in the female share of blue-collar workers in Mexican manufacturing firms.

The emergence of China and its impact on production and trade across the world has also been the subject of substantial empirical research. The earliest strand of empirical literature analysed the impact of China's WTO entry on sectoral level trade flows of other developing countries (e.g. Greenaway et al. 2008). These sectoral level analyses are inconclusive on the effects of China's global integration. Some argue that China poses no major threat to exports by countries like India and Indonesia, because China specializes in different products (Lall and Albaladejo 2004). Others predict potentially large increases in

competitive pressure (Eichengreen et al. 2007), especially in the textile sector (Ianchovichina and Walmsley 2005).

Using firm level analysis, Iacovone et al. (2013) find no effects of Chinese competition on R&D expenditures by Mexican firms. Utar and Ruiz (2013) show that Chinese penetration in the US reduced the growth of output and employment in Mexican export processing and assembling plants (maquiladoras), but also increased efficiency and skill intensity.

### 3. Empirical strategy

#### 3.1. Data

Information on the MFA quota dismantling process is gathered from administrative sources. For the European Union quotas with respect to India and China, we use the EC SIGL online database ([http://trade.ec.europa.eu/sigl/info\\_textile.htm](http://trade.ec.europa.eu/sigl/info_textile.htm)), which reports the yearly quantities of products reported under quantitative restrictions from each country.<sup>1</sup> The utilization (the so-called fill) of the quota is calculated by dividing the total quantity (measured in constant physical units) imported in any given product category by the level of the quota.<sup>2</sup> We define a quota as binding if it has been filled to at least 90%.

Our analysis of the formal sector uses nine rounds of the Annual Survey of Industries (ASI), which is a survey for a nationally representative sample of manufacturing firms in India with at least 20 employees. We cleaned the sample to include only a balanced panel of plants across the years 2000-2008 operating in the textiles and apparel industries, which leaves us with 873 plants each year. The ASI is a combination of a census and survey data, thus non-inclusion or inclusion of some plants for a few years across the dataset for these years cannot be clearly inferred as exit or entry. We therefore stick to a strongly balanced panel for the entire study and do not study entry or exit as an outcome variable. The data is

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<sup>1</sup> We also collected quota data for the United States, from the yearly “Expired performance reports”,

<sup>2</sup> Quota levels are adjusted to incorporate flexibility provisions.

organized at the product level (for up to 10 main products for each firm) and includes product codes, prices for products sold, prices of inputs purchased domestically and imported directly, assets, and details on the number of workers and their earnings. Our outcome variables are sales, assets, total workers and workers by sex, and the wage bill. The final sample size in the estimations varies across years, as firms not always report positive sales or output per product, which is needed for the quota variables, as we discuss below.

The analysis of the informal sector uses the National Sample Survey (NSS) of Unorganized Manufacturing, which is representative for the population of manufacturing firms with fewer than 20 employees. This survey is administered only once in every five years, and does not track firms over time. In our analysis we use the 2000/01 and 2005/06 waves and create a synthetic panel by aggregating the firm level data to the level of 3-digit industries by state (our analysis sample consists of five textiles and apparel industries across 33 states). The data include the total value of manufactured output, as well as 5-digit product codes and the value of output for five main products. Many other firm characteristics are recorded as well, including total sales (income), the number of workers, wages paid, and assets.

We merge the quota data to the ASI and NSS by creating a concordance between the 3-digit EU product codes and the 5-digit ASICC codes that classify products in the Indian data. Hence, for each firm in the ASI data and each state-industry in the NSS data, we know to what extent each of their products was subject to EU import quota. Similarly, we know to what extent each of their products was subject to EU quota on Chinese imports.

Next, to measure firms' or state-industries' exposure to (binding) quotas, we calculate the share of their initial output that was subject to quotas. Since firms can be expected to endogenously adjust the product mix (Bernard et al. 2011), we keep the product shares fixed in the first period, i.e. the year 2000. Our two measures for quota exposure are the following:

$$Exposure\ to\ quota_{it} = \sum_j \left( \frac{y_{ij,2000}}{y_{i,2000}} \times Quota_{jt} \right) \quad (1)$$

$$Exposure\ to\ binding\ quota_{it} = \sum_j \left( \frac{y_{ij,2000}}{y_{i,2000}} \times Binding\_quota_{jt} \right) \quad (2)$$

With subscript  $i$  for the firm or the state-industry,  $j$  for product, and  $t$  for year.

Given the years covered by the two datasets, we cannot analyse each of the four phases in the MFA quota dismantling, which started in 1995 (as summarized in Table 1). As our data cover years only from 2000 onwards, we focus on the third and fourth phase. For the informal sector, with data for 2000/01 and 2005/06, our analysis will capture the combined impact of the phase III and IV quota abolishment: the year 2000/01 is the year before quota abolishment and before China's WTO entry, while 2005/06 is the year after. For the formal sector, we use the annual data from 2000 to 2008, so we capture phases III and IV of the quota abolishment separately.

Table 3 summarizes the quota measures and dependent variables for the formal sector, for the years 2000 and 2005 (i.e. the pre-phase III year and the first post-phase IV year). Table 4 summarizes the quota measures and dependent variables for the informal sector.

In the formal sector, the average firm had almost 59 per cent of output subject to EU quota in 2000, and 55 per cent subject to binding quota – by 2005 all EU quota on Indian imports had been abolished and hence exposure to (binding) quota was zero for all firms in that year. Firms' exposure to EU quota on Chinese imports (EU-CHN quota) was 68 per cent in 2000, but only 9.6 per cent if considering binding quota only. In 2005, some of products were still subject to quota on Chinese imports, and the average firm exposure was 15 per cent. Exposure to EU quota in 2000 was lower in the informal sector, with on average 24 per cent of state-industries' output subject to binding quota. Yet exposure to EU-CHN quota - especially to binding EU-CHN quota - was comparable or even higher.

**Table 3. Summary statistics on quota exposure, Indian firms (ASI)**

|                                  | Year=2000 |           |     | Year=2005 |           |     |
|----------------------------------|-----------|-----------|-----|-----------|-----------|-----|
|                                  | Mean      | Std. Dev. | N   | Mean      | Std. Dev. | N   |
| Exposure to EU quota             | 0.589     | 0.473     | 673 | 0         | 0         | 615 |
| Exposure to EU binding quota     | 0.551     | 0.476     | 673 | 0         | 0         | 615 |
| Exposure to EU-CHN quota         | 0.681     | 0.443     | 673 | 0.150     | 0.339     | 615 |
| Exposure to EU-CHN binding quota | 0.096     | 0.287     | 673 | 0.150     | 0.339     | 615 |
| ln Sales                         | 18.771    | 2.026     | 759 | 18.859    | 2.220     | 701 |
| ln Fixed Capital                 | 18.898    | 1.440     | 620 | 19.139    | 1.451     | 598 |
| ln Total workers                 | 5.981     | 1.189     | 868 | 5.863     | 1.344     | 822 |
| ln Female workers                | 3.649     | 1.562     | 536 | 3.809     | 1.573     | 499 |
| ln Male workers                  | 5.416     | 1.528     | 839 | 5.314     | 1.539     | 792 |
| ln Wage bill                     | 16.629    | 1.432     | 868 | 16.695    | 1.536     | 822 |

Sources: ASI data, EU quota data, and authors' calculations.

**Table 4: Descriptive statistics for NSS sample**

|                                  | Year = 2000 |          |     | Year = 2005 |          |     |
|----------------------------------|-------------|----------|-----|-------------|----------|-----|
|                                  | Mean        | St. dev. | N   | Mean        | St. dev. | N   |
| Exposure to EU quota             | 0.402       | 0.341    | 103 | 0           | 0        | 103 |
| Exposure to binding EU quota     | 0.241       | 0.296    | 103 | 0           | 0        | 103 |
| Exposure to EU-CHN quota         | 0.590       | 0.336    | 103 | 0.274       | 0.285    | 103 |
| Exposure to binding EU-CHN quota | 0.224       | 0.259    | 103 | 0.273       | 0.286    | 103 |
| ln Sales                         | 19.643      | 2.887    | 103 | 19.995      | 2.876    | 103 |
| ln Assets                        | 19.318      | 3.235    | 103 | 19.675      | 3.111    | 103 |
| ln Total workers                 | 9.326       | 2.974    | 103 | 9.328       | 2.934    | 103 |
| ln Female workers                | 8.413       | 2.950    | 100 | 8.636       | 2.734    | 99  |
| ln Male workers                  | 8.638       | 3.154    | 101 | 8.736       | 2.952    | 98  |
| ln Wage bill                     | 17.451      | 2.992    | 99  | 17.975      | 2.959    | 97  |

Sources: NSS data, EU quota data, and authors' calculations.

One striking result from these descriptive statistics is that Indian firms in both the formal and informal sector become *more* exposed to EU quota on Chinese imports between 2000 and 2005. Hence, the products produced by Indian firms in 2000 faced less competition from China on the EU market in 2005 than in 2000. This is due to the fact that the EU and China agreed on maintaining part of the EU quota after 2005, and apparently the binding quota that remained affected those goods that Indian firms already produced in 2000 a bit more than the quota that were binding in 2000. We thus expect that the effects of gaining

market access to the EU textiles market and at the same time reducing foreign competition on those markets should reinforce each other.

### 3.2. Estimation strategy

In our estimation strategy, the identifying variation comes from a combination of cross-firm or cross-state-industry differences in the initial product mix and time and product variation in the EU quota schedules. Using the quota variables described above, our regression analysis exploits variation across time and across firms (or state-industries, in the case of the informal sector).

In the firm level regressions for the formal sector, the time variation allows for comparing outcomes before and after the removal of (binding) quota, while the firm variation allows for comparing firms more exposed to quota to firms less exposed, base on their initial product mix. In other words, we compare outcomes of firms producing products that are subject to the removal of binding quotas before and after the removal of the quota, and relative to firms producing products not subject to binding quota removal. We combine this comparison with the removal of quotas on Chinese exports (which include product groups produced by Indian firms as well) versus the removal of quotas on Indian exports.

Our first estimations regress the outcome variable for firm  $i$  in year  $t$  on exposure to (binding) EU quota, controlling for firm fixed effects  $\theta_i$  and year fixed effects  $\gamma_t$ :

$$\ln Y_{it} = \beta_1 QuotaMeasure_{it} + \theta_i + \gamma_t + \epsilon_{it} \quad (3)$$

We thus exploit annual variation in our analysis of the firm-level ASI data. For the informal sector, the analysis follows a similar estimation equation, but with the outcome measured at state-industry level and with only two years in the data:

$$\ln Y_{st} = \delta_1 QuotaMeasure_{st} + \mu_s + \rho_t + \varepsilon_{st} \quad (4)$$

where index  $s$  denotes the different state-industry combinations and  $t$  denotes the two years. State-industry fixed effects  $\theta_s$  absorb time invariant differences between the five 3-digit industries across states, whereas the year fixed effects  $\gamma_t$  capture all common shocks.

In both models, the dependent variables are sales, fixed capital, total workers, male and female workers, and the wage bill. All outcomes are measured in logs.

In a second set of estimations, we include both the EU quota applying to Indian and those applying to Chinese manufacturers, to distinguish between the effects of market access and foreign competition. As described above, our regressions apply two different quota measures, distinguishing between the exposure to any quota and the exposure to a binding quota, which we define as a quota that has been filled to at least 90%.

## 4. Results

Our first set of results in table 5 and 6 show the estimated effect of exposure to EU quota on Indian imports. We find little evidence of a significant relationship between EU quota and outcomes in the formal or informal sector. The only statistically significant results are the impacts of exposure to binding EU quota on male and/or female workers: firms seem to adjust employment as a response to increased market access, without this being adequately reflected in sales or even the wage bill.

Panel B in table 5 shows that a 0.1 reduction in the exposure to a binding EU quota is associated with a 2.9% increase in female employment and a 0.9% reduction in male employment among formal manufacturing firms in the textiles and garments. In the informal sector (Table 6, panel B), a 0.1 reduction in the exposure to binding EU quota is associated with 7.6% increase in male employment. In none of the samples do we find adjustment in the total workforce, only a shift in the composition of employees. With increased market access, formal firms tend to shift towards employing more female workers whereas the informal firms shift towards more male workers. These results could reflect some technological readjustment in the face of increasing market access but the different patterns among formal and informal firms and especially the missing aggregate effects make it more likely that our results are actually spurious.

**Table 5: impact of EU quota, 2000-2010 ASI**

|                                 | Sales               | Fixed capital      | Total workers      | Female workers         | Male workers        | Wage bill          |
|---------------------------------|---------------------|--------------------|--------------------|------------------------|---------------------|--------------------|
| <b>Panel A</b>                  |                     |                    |                    |                        |                     |                    |
| Exposure to EU quota            | -0.0162<br>(0.0766) | 0.0228<br>(0.0379) | 0.0253<br>(0.0521) | -0.0945<br>(0.0761)    | 0.0601<br>(0.0501)  | 0.0488<br>(0.0569) |
| N                               | 5623                | 4558               | 5874               | 3716                   | 5738                | 5878               |
| R2                              | 0.005               | 0.239              | 0.023              | 0.012                  | 0.026               | 0.024              |
| <b>Panel B</b>                  |                     |                    |                    |                        |                     |                    |
| Exp. to <i>binding</i> EU quota | 0.0567<br>(0.0738)  | 0.0557<br>(0.0353) | 0.0079<br>(0.0488) | -0.2910***<br>(0.0780) | 0.0912*<br>(0.0487) | 0.0771<br>(0.0552) |
| N                               | 5623                | 4558               | 5874               | 3716                   | 5738                | 5878               |
| R2                              | 0.005               | 0.240              | 0.023              | 0.027                  | 0.027               | 0.025              |

Note: All dependent variables are measured in natural logs. All estimations include firm fixed effects and year fixed effects. Robust standard errors are in parentheses.

**Table 6: impact of EU quota, 2000-2005 NSS**

|                                 | Sales             | Fixed capital     | Total workers     | Female workers    | Male workers        | Wage bill        |
|---------------------------------|-------------------|-------------------|-------------------|-------------------|---------------------|------------------|
| <b>Panel A</b>                  |                   |                   |                   |                   |                     |                  |
| Exposure to EU quota            | -0.040<br>(0.411) | -0.523<br>(0.563) | -0.519<br>(0.356) | -0.257<br>(0.451) | -0.531<br>(0.342)   | 0.048<br>(0.749) |
| N                               | 206               | 206               | 206               | 199               | 199                 | 196              |
| R2                              | 0.088             | 0.063             | 0.029             | 0.021             | 0.032               | 0.028            |
| <b>Panel B</b>                  |                   |                   |                   |                   |                     |                  |
| Exp. to <i>binding</i> EU quota | -0.169<br>(0.484) | -0.845<br>(0.700) | -0.670<br>(0.422) | -0.495<br>(0.540) | -0.767**<br>(0.378) | 0.700<br>(1.017) |
| N                               | 206               | 206               | 206               | 199               | 199                 | 196              |
| R2                              | 0.090             | 0.075             | 0.036             | 0.030             | 0.047               | 0.039            |

Note: All dependent variables are measured in natural logs. All estimations include state-industry fixed effects and a year fixed effect. Robust standard errors are in parentheses.

Moreover, there are not only no significant effects on aggregate employment, but sales, assets, or even the wage bill do not adjust either. The effects on sales, fixed capital, and the wage bill in the formal sector are of the opposite sign (suggesting that quota abolition would lead to a reduction in firm size) and all estimates are very imprecise. The effects of binding EU quotas on sales and assets in the informal sector do point towards an expansion of the sector as quotas were abolished, but the coefficients are not statistically significant. This could potentially be due to measurement error in these variables, with sales and assets

more difficult to report than the number of workers. Furthermore, the wage bill in the informal sector refers only to wages for hired workers, while most of the workers are owners and unpaid family members – this can explain why the effect on male workers is not reflected in the wage bill.

Table 7 and 8 show the estimation results for the regressions including both the EU quota as well as the EU-CHN quota exposure variables, to distinguish between the effects of EU market access and Chinese competition on the EU market. We find the same results with regard to the binding EU quota on Indian imports (see panel B of each table): reduction in exposure to binding quota is related to an increase in female employment and a slight reduction in male employment in the formal sector, and is related to an increase in male employment and total employment in the informal sector, while no other outcome is affected.

**Table 7: impact of EU quota on Indian and Chinese imports, 2000-2010 ASI**

|                                     | Sales               | Fixed capital      | Total workers       | Female workers        | Male workers        | Wage bill          |
|-------------------------------------|---------------------|--------------------|---------------------|-----------------------|---------------------|--------------------|
| Panel A                             |                     |                    |                     |                       |                     |                    |
| Exposure to EU quota                | -0.0464<br>(0.0901) | 0.0169<br>(0.0452) | 0.0309<br>(0.0581)  | -0.0478<br>(0.0765)   | 0.0712<br>(0.0547)  | 0.0350<br>(0.0650) |
| Exp. to EU-CHN quota                | 0.0686<br>(0.0648)  | 0.0136<br>(0.0297) | -0.0176<br>(0.0366) | -0.118**<br>(0.0460)  | -0.0468<br>(0.0365) | 0.0158<br>(0.0413) |
| N                                   | 5588                | 4512               | 5779                | 3668                  | 5643                | 5783               |
| R2                                  | 0.006               | 0.239              | 0.023               | 0.014                 | 0.026               | 0.024              |
| Panel B                             |                     |                    |                     |                       |                     |                    |
| Exposure to binding EU quota        | 0.0534<br>(0.0739)  | 0.0544<br>(0.0357) | 0.00249<br>(0.0489) | -0.305***<br>(0.0793) | 0.0821*<br>(0.0486) | 0.0689<br>(0.0543) |
| Exp. to <i>binding</i> EU-CHN quota | 0.155<br>(0.134)    | 0.0264<br>(0.105)  | 0.0323<br>(0.0659)  | 0.0978<br>(0.0733)    | -0.0472<br>(0.0723) | 0.0405<br>(0.0949) |
| N                                   | 5588                | 4512               | 5779                | 3668                  | 5643                | 5783               |
| R2                                  | 0.006               | 0.240              | 0.023               | 0.028                 | 0.027               | 0.025              |

Note: All dependent variables are measured in natural logs. All estimations include firm fixed effects and year fixed effects. Robust standard errors are in parentheses.

**Table 8: impact of EU quota on Indian and Chinese imports, 2000-2005 NSS**

|   | Sales             | Assets             | Total workers      | Female workers     | Male workers       | Wage bill         |
|---|-------------------|--------------------|--------------------|--------------------|--------------------|-------------------|
| Panel A                                 |                   |                    |                    |                    |                    |                   |
| Exposure to EU quota                    | -0.014<br>(0.409) | -0.565<br>(0.591)  | -0.559<br>(0.355)  | -0.397<br>(0.435)  | -0.502<br>(0.331)  | 0.046<br>(0.741)  |
| Exposure to EU-CHN quota                | -0.285<br>(0.427) | 0.452<br>(0.600)   | 0.422<br>(0.379)   | 0.952**<br>(0.422) | -0.277<br>(0.385)  | 0.025<br>(0.752)  |
| N                                       | 206               | 206                | 206                | 199                | 199                | 196               |
| R2                                      | 0.093             | 0.070              | 0.044              | 0.069              | 0.038              | 0.028             |
| Panel B                                 |                   |                    |                    |                    |                    |                   |
| Exposure to <i>binding</i> EU quota     | -0.528<br>(0.572) | -1.278<br>(0.807)  | -0.852*<br>(0.432) | -0.606<br>(0.536)  | -0.923*<br>(0.466) | 0.405<br>(1.201)  |
| Exposure to <i>binding</i> EU-CHN quota | -0.670<br>(0.524) | -0.806*<br>(0.467) | -0.340<br>(0.322)  | -0.203<br>(0.402)  | -0.272<br>(0.336)  | -0.405<br>(1.127) |
| N                                       | 206               | 206                | 206                | 199                | 199                | 196               |
| R2                                      | 0.112             | 0.093              | 0.044              | 0.032              | 0.052              | 0.042             |

Note: All dependent variables are measured in natural logs. All estimations include state-industry fixed effects and a year fixed effect. Robust standard errors are in parentheses.

Considering the effects of reducing foreign competition, given by the EU quota on Chinese imports, we again find little evidence that it affected the formal or the informal sector. A few estimates are statistically significant. In the formal sector, greater exposure to EU quota on Chinese imports (i.e. greater protection from competition with China) is associated with lower female employment (panel A of Table 7), while in the informal sector it is associated with higher female employment (panel A of Table 8). Yet both effects disappear when we consider only binding quota, which should better capture Chinese competition. Exposure to binding EU-CHN quota is associated with a *lower* value of total assets in the informal sector (significant at the 10% level), but has no other impacts on any of the outcomes.

## 5. Conclusions

This study provides empirical evidence on the effects of access to the EU market on Indian manufacturing firms in the textiles and apparel industries, in both the formal (organized)

and the informal (unorganized) sector. We study these effects by assessing the impact of the removal of MFA import quota that EU imposed on textile and clothing imports from India. As China entered the WTO during the period when MFA quotas were abolished, China also faced increased in access to the EU market. By analysing the impact of the removal of EU quota on Chinese imports, we can identify the effect of South-South competition in export markets on the Indian manufacturers.

We find some evidence for gender-specific employment effects of improved access to the EU market: our results show that in the informal sector, the number of male workers increased more in state-industries that were initially more exposed to binding EU quota, compared to state-industries less exposed. In the formal sector, we find an effect only on female employment, which increased with the abolition of binding EU quota. Yet these impacts are difficult to interpret, as we see no significant effects on total (male plus female) employment, while sales, assets, and the wage bill do not adjust either. Increased competition from China on the EU market, through the abolition of EU quota on Chinese imports, also did not lead to significant adjustments among formal and informal manufacturers of textiles and apparel in India.

One drawback of this study arises from the data. While the ASI and NSS data include detailed information on products manufactured by each firm, there is no information to distinguish between domestic and foreign sales, and hence to determine whether firms produce for the global or the domestic market. Another drawback is the exclusion of US import quota from the analysis, which is due to the serious weaknesses in the concordance between product codes in the US trade data and Indian product codes. By focussing only on the EU market, we are capturing only part of the MFA quota abolition, and this might explain why we find little impact on Indian firms.

## References

- Amiti, M. and Cameron, L. (2012): Trade liberalization and the wage skill premium: Evidence from Indonesia, *Journal of International Economics*, 87(2): 277–287.
- Amiti, M. and Konings, J. (2007): Trade liberalization, intermediate inputs and productivity: Evidence from Indonesia, *American Economic Review*, 97(5): 1611–1638.
- Bernard, A.B., Jensen, J.B., Redding, S.J. and Schott, P.K. (2007), Firms in international trade. *Journal of Economic Perspectives*, 21(3): 103-130.
- Bernard, A.B., Jensen, J.B., Redding, S.J., Schott, P.K. (2012) The empirics of firm heterogeneity and international trade. *Annual Review of Economics*, 4(1): 283-313.
- Bernard, A.B., Redding, S.J., Schott, P.K. (2011), Multi-product firms and product switching. *American Economic Review* 100 (1), 70-97.
- Bloom, N., Draca, M. and Van Reenen, J. (2011) Trade induced technical change? The impact of Chinese imports on innovation, IT and productivity, NBER Working Paper No. 16717, National Bureau of Economic Research, Inc., Cambridge, Mass.
- Brambilla, I., Khandelwal, A.K., Schott, P.K. (2010) China's experience under the Multi-Fiber Arrangement (MFA) and the Agreement on Textiles and Clothing (ATC), In: China's growing role in world trade, Feenstra, R.C. and Wei, S.-J., eds, pp. 345-387.
- Bustos, P. (2011) Trade Liberalization, Exports, and Technology Upgrading: Evidence on the Impact of MERCOSUR on Argentinian Firms. *American Economic Review*, 101(1): 304-340.
- Eichengreen, B., Rhee, Y., Tong, H. (2007) China and the exports of other Asian countries, *Review of World Economics*, 143(2): 201–226.
- Goldberg, P., Khandelwal, A., Pavcnik, N., Topalova, P. (2010), Imported intermediate inputs and domestic product growth: evidence from India, *Quarterly Journal of Economics*, 125(2): 1727-1767.
- Greenaway, D., Mahabir, A., Milner, C. (2008), Has China displaced other Asian countries' exports?, *China Economic Review*, 19(2): 152–169.
- Iacovone, L., Rauch, F., Winters, L.A. (2013) Trade as an engine of creative destruction: Mexican experience with Chinese competition. *Journal of International Economics* 89(2): 379–392.
- Ianchovichina, E. and Walmsley, T. (2005) Impacts of China's WTO Accession on East Asia, *Contemporary Economic Policy*, 23(2): 261-277.
- Juhn, C., Ujhelyi, G. and Villegas-Sanchez, C. (2014) Men, women, and machines: How trade impacts gender inequality, *Journal of Development Economics*, 106: 179-193.

Lall, S. and Albaladejo, M. (2004) China's competitive performance: A threat to East Asian manufactured exports?, *World Development*, 32(9): 1441-1466.

Melitz, M.J. (2003) The impact of trade on intra-industry reallocations and aggregate industry productivity, *Econometrica*, 71: 1695-1725.

UNCTADSTAT (2014), Intra-trade of regional and trade groups by product, annual, 1995-2012, United Nations Conference on Trade and Development, Geneva, <http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx>

Utar, H. (2014) When the floodgates open: "Northern" firms' response to removal of trade quotas on Chinese goods, *American Economic Journal: Applied Economics*, 6(4): 226-250.

Utar, H., Ruiz, L.B.T. (2013) International competition and industrial evolution: Evidence from the impact of Chinese competition on Mexican maquiladoras, *Journal of Development Economics*, 105: 267-287.

Verhoogen, E.A. (2008) Trade, Quality Upgrading, and Wage Inequality in the Mexican Manufacturing Sector, *The Quarterly Journal of Economics*, 123(2): 489-530.

WITS (2014) World Integrated Trade Solutions, World Bank, Washington DC, <https://wits.worldbank.org/WITS/WITS/>

WDI (2014) World Development Indicators, Online Database, World Bank, Washington DC, <http://databank.worldbank.org/data>

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