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Trade liberalization and third-market effects

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Abstract
We study how the end of the quota system for textiles and clothing products in the American and European markets on January 1, 2005, affected China's exports to third countries, where policy was unchanged. Using a difference-in-differences approach, we find that the number of Chinese firms exporting previously restricted products to third countries increased sharply after quota removal. The expansion involved many private firms that exported to neither US-EU markets before nor after 2005. This indicates that the policy shock enhanced China's role as an export base. Conversely, protectionist shifts in large economies would likely generate sizeable negative third-market effects.

Keywords: import quotas; export entry; China
JEL codes: F13; F14; D22

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1 Introduction

When a country changes its trade policy, it affects its involvement in the global economy. This is well understood and has been measured in numerous occasions and in different ways, the usual difficulties in identifying causality notwithstanding. Now, changes in a country's trade policy may also affect the trade flows among countries not directly involved in the policy change. This matters. The reactions in third markets provide an additional dimension upon which trade theories can be judged and contrasted with each other. Moreover, from a policy perspective, understanding these effects is essential to fully assess the consequences of trade liberalization and the risks posed by the current protectionist turn in the US. Nevertheless, there have been very few attempts to measure such a "trade policy externality." In this paper, we offer evidence of that externality and investigate possible mechanisms through which it operates. To do so, we rely on a large policy shock that increased potential export profits to certain destinations for some but not for others, very similar products in the same industry: the end of the quota system for textiles and clothing (T&C) products in 2005.

Exports of some T&C products to the European Union, the United States and Canada were restricted by binding import quotas under the Multifiber Arrangement (MFA) and the subsequent Agreement on Textiles and Clothing until January 1st, 2005, when all quotas were lifted. As Harrigan and Barrows (2009, p. 282) stress, this was a "large, sudden, fully anticipated, easily measured, and statistically exogenous change in trade policy." As such, it provides a rare quasi-natural experiment that can be used to evaluate the impact of trade policy. The quotas restricted imports from numerous countries. However, they constrained imports from China disproportionately (Harrigan and Barrows, 2009). In fact, as Brambilla et al. (2010) show, many other exporting countries, including several that also faced quotas under the MFA, *decreased* their exports to the liberalizing markets after the quotas were lifted in 2005. Thus, it is natural to focus on the reaction of Chinese exporters to the policy change.

Now, unlike previous studies, we assess the impact of the policy change on the export behavior of Chinese firms not toward the liberalizing markets, but toward *markets where policy did not change*. We find that there was a sizeable *increase* in the number of firms from China exporting previously restricted products to those third markets as a consequence of the policy. That is, the policy change induced Chinese firms to export products no longer quantitatively restricted to markets that never restricted them.

In our main analysis, we use Chinese customs export data for years 2003-2006, defined at

the firm-product-destination country level. Since the end of the quota system affected some, but not other similar T&C products, we can compare firms' export behavior for restricted and non-restricted products in the same industry, before and after the policy change. By doing so, we control for the effects of other shocks that affected the demand and the supply of Chinese T&C goods. For example, changes in labor costs affected treatment and control groups similarly. Likewise, policy changes in China—and there were many during our sample period, including measures that affected firms' access to foreign markets—also affected the two groups similarly.

Our identification strategy relies on the fact that the groups of products restricted and unrestricted by the MFA can be safely taken as statistically exogenous in 2005. The quota system grew out of restrictions originating in the late 1950s, well before even the formalization of the MFA, which dates back to 1974. Furthermore, our focus is on changes in Chinese firms' export decisions (volume, entry, exit) not to the markets that implemented the policy change, but to the Rest of the World (ROW). To our knowledge, we are the first to study third-market effects due to a large policy change, such as the end of the MFA.

First, we confirm the main finding from the literature, which documents the expansion of Chinese exports to the liberalizing markets.[1] As we show, that expansion took place at both the intensive and the extensive margins. More interestingly, we find that there was also a significant increase in entry of exporters to ROW. Furthermore, the largest increase in entry in those markets was by firms that did not sell MFA goods to the combined markets of the European Union and the United States—let us call them EUS for brevity—before the policy change. Strikingly, we observe higher entry in ROW for previously restricted products due to the end of the quota system even among the firm-product pairs that did not sell to the EUS under the quota system *and* decided to stay out of the EUS even after the liberalization.

From the perspective of standard neoclassical trade theory, those results may seem surprising. According to that view, if a large importing market suddenly lifts tight restrictions

[1]See in particular Harrigan and Barrows (2009), Brambilla et al. (2010) and Khandelwal et al. (2013). Defever et al. (2015) and Bloom et al. (2016) use the end of the MFA and China's response as an instrument to investigate different questions—how firms expand geographically and how an increase in import competition affects firm's incentives to innovate. Utar (2014) shows that Danish firms reacted to the end of the quotas by upgrading the skill-intensity of their product mix, thus moving away from the products where China's comparative advantage is strongest. Rotunno et al. (2013) focus on Chinese exports that bypassed US quotas by "transshipping" goods through countries that had preferential treatment in the American market under the African Growth and Opportunity Act (AGOA). The benefits of such practice vanished after MFA quotas ended in 2005.

on a source of imports, foreign exporters (or potential exporters) directly affected should divert sales to that market, and *away* from alternative destinations that have become relatively unattractive. Our empirical finding that the entry of Chinese firms in ROW increases after 2005 (in a difference-in-differences sense) contradicts that rationale, implying the existence of other, stronger forces.

Instead, our evidence points to firm de-location effects, as first discussed in the context of heterogeneous-firm models by Melitz and Ottaviano (2008), augmented with firm-market specific shocks (as in Cherkashin et al., 2015). Once the EUS opens up, new firms establish themselves in China as the country becomes a better export base. Some of those new firms sell to the now open EUS, but others serve instead (or also) other markets, perhaps because they find potential buyers only (or also) in ROW—or more generally, because they receive good firm-destination specific demand shocks from markets in ROW.

At a more general level, our findings make clear the interconnectedness of markets, stressing the need to take into account the effects on third markets. Advances in this direction are important; as Alessandria et al. (2021) stress in their review of firm export dynamics, we still understand little about firms' decisions across markets. This is especially important in light of the current US retreat into protectionism. If our results extend to this case, they suggest that trade between countries other than the US could also contract sharply, pointing to a broader decline in global trade.

There is a small but growing literature looking at third-market effects more generally. Bown and Crowley (2007) were the first to study this systematically. They evaluate how Japanese exports reacted to the imposition of antidumping and safeguard measures, finding evidence of "trade deflection": higher Japanese sales to other markets following the imposition of extra US trade barriers on Japanese imports. This seems inconsistent with our findings. Bown and Crowley (2010) look instead at how restrictions imposed on imports from China by the EU and the US during China's pre-WTO accession period affected China's exports to other markets. In that analysis, they find no evidence of trade deflection; if anything, China's exports to third countries fell after increases in restrictions in the EU/US. Those results are, therefore, quite similar to ours, although they look at increases (rather than decreases) of trade barriers against China. Methodologically, the main difference between our paper and Bown and Crowley's papers is that we focus on a specific sector for which we can use a large policy shock that can be fairly described as statistically exogenous, whereas they look at a broader range of industries but have to rely on instrumentation to deal with the endogeneity of the policy changes. Moreover, our analysis is at the firm-product level.

Taking a different approach, Cherkashin et al. (2015) structurally estimate a variant of Melitz's (2003) model with firm-market specific demand shocks, using data from Bangladesh's knitwear exports to the US and the EU in 2004. In their counterfactual experiments, they find significant third-market effects, in the spirit of the findings in this paper. Our results may be interpreted as the econometric counterpart of their structural counterfactual simulations.

More recently, Albornoz et al. (2025) also find evidence of complementarities across markets. They exploit a fairly precise, but quite narrow, policy shock: preferential tariff increases in the US affecting a limited number of products exported from Argentina. In contrast, our analysis represents a large decrease in trade barriers in both the US and the EU, in a major trading sector, directly affecting the world's largest exporter. Defever et al. (2015), Albornoz et al. (2016), Morales et al. (2019) and Alfaro-Urena et al. (2023) also study market interdependencies, but focus on explaining the geographical pattern of exporter expansion.[2] Bernard et al. (2018) develop a broad model to explain how "global firms" choose markets, products and sourcing strategies, highlighting a variety of interdependencies.[3]

2 The trade policy shock

2.1 The MFA and the 2005 change in policy

Quotas on textiles began with US restrictions on Japan in 1955 and expanded through the 1960s, culminating in 1974 with the Multifiber Arrangement (MFA), which formalized a fragmented system of bilateral quotas outside GATT rules.[4] Crucially for our empirical exercise, under the MFA quotas applied to some, but not to other similar T&C products. The range of affected products varied across importing countries, and quotas were specific to each exporting country.

This regime lasted until 1995, when the Agreement on Textiles and Clothing (ATC)

[2]A related literature studies the relationship between domestic sales and exports. In different contexts, Blum et al. (2013), Almunia et al. (2021) and Medina (2024) find evidence for substitutability between them. In contrast, Berman et al. (2015) find that when foreign demand unexpectedly drops, firms' domestic sales also fall.

[3]A large literature studies the consequences of regional trade agreements for excluded countries. Most of that literature focuses, however, on the forces affecting the imports of the integrating countries from outsiders, not on how exports from 'members' (China, in our analog case) to 'non-members' (ROW) change with the introduction of preferences (see, e.g., the survey by Freund and Ornelas, 2010, or Lee et al., 2023, for a recent analysis).

[4]See Naumann (2006) for details on the history of quantitative restrictions in those industries.

launched a ten-year, four-stage phase-out. Countries could decide which products to liberalize, postponing up to half of their 1990 import volumes until the final stage.

Unsurprisingly, products no longer subject to quotas, or for which quotas were non-binding, were liberalized in the first three stages, while the removal of binding quotas was postponed until the final stage (Nordås, 2004). As a result, the final phase of liberalization, on 1 January 2005, was by far the most disruptive. Importantly, the decision on which goods to include in each stage was made in 1995 and therefore was not affected by market conditions ten years later.

2.2 China and the MFA

China did not enter the WTO until 2001. Therefore, it did not participate in the negotiations leading to the ATC, and it was not eligible to receive the ATC benefits until its entry into the WTO. Upon entry, previously liberalized products were extended to China. On 1 January 2005, the remaining quotas were lifted both for China and for the rest of the world. This abrupt end of the quota restrictions on Chinese products provides an exogenous trade shock that we can use to evaluate the impact of trade liberalization on third countries.

Previous research makes one point very clear: the final round of liberalization affected China disproportionately more than other exporting countries. This is well documented by Harrigan and Barrows (2009) and by Brambilla et al. (2010). As Brambilla et al. show, relative to other countries, China's quotas were more likely to be binding, they grew at a slower rate, and there were greater restrictions on shifting quota allocations across different categories of goods or across years. As a result, in 2005 China's export volumes to the United States of goods previously restricted by quotas jumped 271 percent, while its overall export volumes in the T&C sectors increased 39 percent. Qualitatively similar effects took place in Europe. By contrast, many other countries that also faced quotas did not increase their exports after the restrictions were lifted, stressing the significantly more lenient restrictions that they faced, relative to China. Indeed, as Brambilla et al. (2010) indicate, in 2005 aggregate exports of the affected products from the rest of the world to the United States *fell* by 2 percent.

As Khandelwal et al. (2013) argue forcefully, an important feature of the quota allocations in China is that they were not defined according to efficiency-related criteria (as it would be the case, for example, if the quotas were competitively auctioned). Instead, they were allocated according to various political-economy criteria that, although unknown

to researchers, were virtually uncorrelated with firm productivity. Thus, in addition to the direct inefficiency of the quotas, there was an additional distortion in China due to the misallocation of the licenses.[5]

3 Data and identification

3.1 Data

We use Chinese customs export data, at the firm-product-destination country level.[6] We use annual data for the period 2003-2006, so we have two years of data both before and after the policy shock (data for 2001–2002 are used to construct our placebo.) Quota restrictions were defined at the 8-digit product level of the Harmonized System (HS) for chapters 50-59 (*Textiles*) and chapters 60-62 (*Clothing*).

Restricted products are listed in the annex of the WTO protocol. However, the quota restriction varies widely across products. Hence, for each HS 8-digit product we calculate *fill rates*, i.e., total exports relative to the quota limit. Following the USITC—as well as Evans and Harrigan (2005), Harrigan and Barrows (2009), and Brambilla et al. (2010)—we define a quota to be binding if the fill rate in 2004 is higher than 90 percent in either the US or the EU.[7] We define a product as "MFA" if this requirement is met. Conversely, we consider the T&C products that are not listed in the annex of the WTO protocol, or are listed but have a fill rate lower than 90% both in the EU and in the US, as "non-MFA."

The focus of our analysis is on the dynamics of Chinese exports to the Rest of the World, which includes non-EU European countries, Africa, Latin America, Asia and Oceania.[8] We also consider a subset of ROW, composed of Japan, Australia and New Zealand ($JANZ$). These were the only developed economies outside Europe that did not apply T&C quotas

[5]Khandelwal et al. (2013) observe that trading of quota licenses was illegal in China and secondary markets were too modest to allow efficient reallocation of the licenses. Hence, most unlicensed firms simply could not sell to the restricted markets until 2005.

[6]See Manova and Zhang (2012) for a detailed description of the Chinese customs data.

[7]We do not include binding quotas in Canada in the definition of MFA products. The reason is two-fold. First, since the Canadian market is much smaller than the American or the European, it should have a much smaller effect on ROW. More importantly, the level of quantitative restrictions in Canada by the end of the ATC had already been significantly reduced. Indeed, according to Francois (2010), the effect of the Canadian quotas vis-à-vis China, as measured by the export tax equivalent, was already zero in 2004.

[8] In 2004, ten Central and Eastern European countries joined the EU. To avoid introducing an artificial decrease of exports to ROW in the year before the policy shock, which would exacerbate our estimations, we consider those countries as part of the EUS even before their formal EU accession. Furthermore, following Feenstra and Hanson (2004), we exclude from the analysis the transactions to Hong Kong and Macau.

under the MFA in 2004. Furthermore, they are clear net importers in the sector, so we do not expect any direct impact of the EUS policy change on their T&C producers. Thus, restricting the analysis to exports to $JANZ$ avoids potential conflicting effects due to supply changes in some countries in ROW driven by the elimination of the MFA. Collectively, those countries constitute a large market for China's T&C industry, representing 65% of the Chinese transactions to the ROW.

We end up with a panel of 707 products exported to ROW during our sample years, with MFA products accounting for about 30% of the total. When considering only the $JANZ$ markets, the number of products drops to 667, but the proportion of MFA products remains virtually unchanged.

To shed light on the mechanisms behind the average effects, we allow for differential effects by "firm status." As Khandelwal et al. (2013), who stress the differential behavior of state-owned (*SOEs*) and private (*notSOEs*) firms, we distinguish between those two types of firms to investigate whether their responses of their sales to ROW are also distinct. More broadly, we distinguish the firms selling in ROW according to their involvement in the EUS, where the policy changed. Specifically, we classify firms into those that sold some MFA product in the EUS before 2005, having possibly obtained the licenses through non-market forces (which we denote by *license* firms); those that sold an MFA product in the EUS only after 2005 (*entryEUS* firms); and those that did not sell any MFA product in the EUS during our sample period (*noentryEUS* firms). These groups, which are mutually exclusive and comprehensive, allow us to identify how firms with different levels of involvement in the EUS markets changed behavior in ROW as a result of the policy shock.

Table 1 shows descriptive statistics for the different types of firms in the two aggregate markets. In the EUS, over 40 percent of the observations are for SOEs. In ROW, their share is just below a third of the observations. Each of the three different groups of private firms selling in ROW is well represented, having shares between 15% and 30% of the total.

3.2 Identification strategy

Our identification strategy relies on the comparison between restricted and unrestricted products. While some textile and clothing products were restricted by import quotas, other similar products were not. For example, shipments of 'cotton slips' to the US were subject to restrictive quotas in 2004, while exports of 'silk slips' were not.

The list of restricted products in 2004 was arguably statistically exogenous. The system

Table 1: Number of observations, firm-product-destination level, 2003-2006

	Frequency	Percent	Frequency	Percent
EUS	1,213,173	35.49		
$\times SOE$			505,350	14.78 (41.66)
$\times notSOE$			707,823	20.71 (58.34)
ROW	2,205,172	64.51		
$\times SOE$			703,929	20.59 (31.92)
$\times notSOE \times license_f$			323,580	9.47 (14.67)
$\times notSOE \times entryEUS_f$			528,030	15.45 (23.95)
$\times notSOE \times noentryEUS_f$			649,633	19.00 (29.46)
Total	3,418,345	100.00	3,418,345	100.00

Data: Chinese customs records, 2003–2006. Each observation is defined at the firm × HS-8 digit product × destination country × year level. *EUS*: exports to EU member states or the United States; *ROW*: exports to all other countries. Firms are classified as *SOE*s or non-SOEs, and further by MFA involvement in the EUS: $License_f$ (firms exporting at least one MFA product before 2005), $entryEUS_f$ (firms exporting MFA products only after 2005), $noentryEUS_f$ (firms with no MFA exports during the sample period).

of quotas exhibited strong path dependence, and its history dates back to 1955. Especially during the period when the MFA was fully operative (1974-1994), the changes were chiefly in terms of countries affected and the size of the quotas, and much less so in terms of adding and subtracting products. Furthermore, while the ATC allowed for sequencing in the removal of quotas, those decisions were made in 1994, more than a decade before the last phase (on which we focus) took place and when the extension of the agreement to China—by then outside the WTO—was still only a remote possibility. Finally, we study exports from China *to ROW*, not to the markets of the countries deciding which products to protect with quotas.

Thus, by contrasting the sales of Chinese firms of restricted and unrestricted T&C products to *ROW* in the years before and after the quotas were removed, we control for shocks to supply, such as changes in labor costs, and shocks to demand, such as changes in the preferences of consumers, that are plausibly common to both groups of goods. This strategy also controls for other policy changes in China and in the rest of the world, since there was no other policy change in that period that explicitly targeted the T&C products facing binding quotas in the *EUS* markets. Thus, the policy shock allows us to identify the causal effects of the policy change in the EU and the US on firm-level Chinese exports to *ROW*.

4 Firm-product-level analysis

4.1 Estimating equation

We study an outcome variable Y_{ijdt} related to the exports of a Chinese firm i to a foreign destination country d of a specific HS-8 digit product j in year t, covering the period from 2003 to 2006. Our main goal is to determine how the lifting of quotas on some T&C products in the EUS markets affected that variable in countries that are part of ROW.

The baseline regression we estimate, at the firm-product-destination-year level, is

$$Y_{ijdt} = \beta \left(MFA_j \times POST_t \right) + \{\text{fixed effects}\} + \epsilon_{ijdt}, \tag{1}$$

where Y_{ijdt} is either a dummy variable capturing entry/exit (extensive margin) or the log change in export value/price (intensive margins) of a specific HS-8 digit product j sold by a Chinese firm i in destination country d between years t and $t-1$. MFA_j is a dummy that is equal to one if imports of product j faced a binding quota restriction in 2004 in the EUS; $POST_t$ is a dummy that is equal to one for years 2005 and 2006.

We estimate this regression separately for all export transactions in which the destination country belongs to one of three regions: EUS, referring to the markets affected by the policy change; ROW, including all foreign markets except the EUS; and $JANZ$, a subset of countries within ROW: Japan, Australia, and New Zealand.

Standard errors are clustered both at the HS-8 digit product level and at the firm level. When studying the extensive margin, we use product-destination $\{\delta_{jd}\}$ and year-destination $\{\delta_{td}\}$ fixed effects.[9] When studying the intensive margin, we use firm-product-destination $\{\delta_{ijd}\}$ and year-destination $\{\delta_{td}\}$ fixed effects. In this case, because of the firm-product-destination fixed effects, the coefficients are identified out of firm-product pairs sold in market d before and after the policy change.

4.2 Entry & exit

Table 2 shows the results for entry and exit. In column 1, we consider entry at the firm-product-destination level, where the dependent variable is a dummy that takes value 1 if firm i sells product j in country d in year t but not in year $t-1$. For the EUS, there is a large and significant increase in the number of firms selling previously restricted products

[9] Observe that, in the entry and exit regressions, we cannot use firm-product-destination fixed effects, because most firm-product pairs enter/exit a market only once.

after 2005. This enhanced entry in the EUS has been well documented by other authors, starting with Harrigan and Barrows (2009). More interestingly, we also identify a novel significant increase in the number of firms selling MFA products in ROW after 2005. The magnitude of the effect is around one third of the magnitude for the EUS. Relative to the unconditional sample mean of the entry variable in ROW (0.71), the effect of the shock represents an increase of 35 percent. The third row shows the results when we restrict ROW to $JANZ$. The point estimates of the two sets of results are strikingly similar, indicating that the same qualitative reactions of Chinese exporters to ROW are also observed toward the specific markets of the rich importing countries not involved in the policy change.

Table 2: Extensive and intensive margin effects

	entry	entry firms	entry product	exit	$\triangle \log(value)$	$\triangle \log(price)$
	(1)	(2)	(3)	(4)	(5)	(6)
$MFA_j \times POST_t$	0.081^a	0.028^a	0.053^a	0.009	0.121^a	-0.028^c
in EUS	(0.009)	(0.005)	(0.007)	(0.009)	(0.046)	(0.016)
$MFA_j \times POST_t$	0.025^a	0.019^a	0.006	0.003	0.015	0.002
in ROW	(0.005)	(0.005)	(0.004)	(0.006)	(0.028)	(0.008)
$MFA_j \times POST_t$	0.023^a	0.010^b	0.013^a	0.003	0.041	0.001
in JANZ	(0.006)	(0.005)	(0.005)	(0.009)	(0.038)	(0.010)
$MFA_j \times PLACEBO_t$	0.003	-0.006	0.009	0.002	-0.054	-0.012
in EUS	(0.010)	(0.005)	(0.010)	(0.007)	(0.061)	(0.019)
$MFA_j \times PLACEBO_t$	0.004	0.004	0.000	-0.005	-0.010	-0.014
in ROW	(0.006)	(0.004)	(0.006)	(0.004)	(0.035)	(0.011)
$MFA_j \times PLACEBO_t$	-0.001	-0.001	-0.000	-0.013^a	0.041	-0.009
in JANZ	(0.009)	(0.004)	(0.009)	(0.005)	(0.044)	(0.013)

Notes: Regressions (1)-(4) include product-destination and year-destination fixed effects. Regressions (5)-(6) include firm-product-destination and year-destination fixed effects. For the period 2003–2006 (rows 1–3), once singletons are excluded, there are 1,210,371 firm–product–destination observations in the EUS, 2,188,305 in ROW, and 588,046 in JANZ. When considering continuous exporters (intensive margin, columns 5-6), there are 33,288 firm-product-destination observations in the EUS, 75,568 in ROW, and 49,596 in JANZ. For the period 2001-2004 (placebo, rows 4-6), there are 681,798 firm-product-destination observations in EUS, 1,468,060 in ROW, and 461,557 in JANZ. When considering continuous exporters (intensive margin, columns 5-6), there are 26,526 firm-product-destination observations in EUS, 62,637 in ROW, and 40,605 in JANZ. Standard errors, clustered both at the HS-8 digit product level and at the firm-level, are in parentheses. a: significant at the 1 percent; b: significant at the 5 percent; c: significant at the 10 percent level.

In columns 2 and 3, we decompose the results in column 1 between the entry of new exporting firms and of new products from existing exporting firms. In the EUS, both increase with the liberalization. The impact on the entry of new exporting firms in ROW is also positive and highly significant, with a coefficient that is only a third smaller than the one observed in EUS. The estimated coefficient for new MFA products in ROW is positive as well. When considering $JANZ$, there is a more even split of entry of firm-product pairs between firms and products. These results make clear that the liberalization in the EUS caused substantial entry of Chinese firms and products in third markets.[10]

To study exit at the firm-product-destination level, we use as dependent variable a dummy that takes value one if there are positive sales of product j by firm i in country d in year $t-1$ but not in year t. The results are shown in column 4. There is no statistically perceptible change in the average exit rates in any market.

4.3 Values & prices

In columns 5 and 6, the dependent variable is, respectively, the change in value and in price for all "continuous exporters," defined as firm–product–destination triplets observed in each of the four years of the sample, as well as in the prior year, to avoid capturing the growth rates of newly established exporters.

For firms serving the EUS, the policy shock had a large positive impact on values—a 12 percent relative increase in the yearly variation in volume of sales of the previously restricted products. There was also a (small) reduction in prices, possibly reflecting the enhanced competition. On the other hand, the effects on sales and prices in ROW and $JANZ$ are small and statistically not different from zero. Therefore, there is no evidence that the opening of the EUS market had a meaningful effect on the behavior of continuous exporters to $ROW/JANZ$.

4.4 Placebo

To check the validity of our identification, we provide a "placebo" exercise. We consider the pre-shock years 2003-2004 as the "POST" period, and use the previous two years, 2001-2002, as the basis for comparison. This exercise is analogous to the placebo analysis carried out

[10]It is worth noting that any firm reaction to the policy before its implementation due to anticipation would tend to downplay the observed effects of the policy, thus lowering the magnitude and significance of the diff-in-diff estimates.

by Khandelwal et al. (2013).

Rows 4-6 of Table 2 show the results. The positive and significant effects we obtain for entry in the main regressions are entirely absent in the placebo exercise. Not only the coefficients are statistically indistinguishable from zero, their point estimates are virtually zero as well. That is especially reassuring for the EUS estimates, where any anticipation would have been severely limited by the quotas themselves. There is no effect for ROW either.

Looking at the other dependent variables, we observe no significant effects in all markets, with the exception of a small decrease of the exit rate in $JANZ$ in the years right before the end of the quota system.

4.5 Robustness

We now scrutinize the positive third-market results further, as some confounding factors could possibly be driving them.

First, instead of considering countries individually, we aggregate them into a single destination group (EUS, ROW or $JANZ$). Second, we exclude "safeguard products," for which quotas were re-imposed on some Chinese imports in the second half of 2005. Third, the raw data contains a number of trading agents that mediate trade for other firms, but do not directly engage in production. The behavior of those firms is probably different from that of manufacturing firms. To exclude the possibility that our results are driven by these trading agents, we exclude them. Fourth, including transactions undertaken using processing trade may be problematic as this customs regime is subject to different tariff levels and potentially to a preferential treatment when exporting. Thus, we re-run the regressions excluding processing trade export transactions.

Tables B.1 and B.2 in the Online Appendix show that both the extensive- and intensive-margin results remain similar to those in Table 2.

4.6 Firm heterogeneity in Entry

Our main finding regards the increased entry of firms and products in the ROW markets. We now explore heterogeneity across different firm status on entry. Our estimating equation becomes

$$Y_{ijdt} = \sum_{i \in FS} \left\{ \gamma_{FS} \left(MFA_j \times POST_t \times FS_i \right) \right\} + \left\{ \delta_{jds} \right\} + \left\{ \delta_{tds} \right\} + \epsilon_{ijdt}, \tag{2}$$

where FS_i defines 'firm status,' as discussed in section 3. Specifically, we distinguish firms selling in ROW between those that sold some MFA product in the EUS before 2005 ('license'); those that sold an MFA product in the EUS only after 2005 ('entry EUS'); and those that did not sell any MFA product in the EUS during our sample period ('no entry EUS'). We add fixed effects for product-destination-firm-type and year-destination-firm-type.

Table 3: Entry by firm-types at the firm-product-destination level

	Non-license firms with entry in EUS	Non-license firms without entry in EUS	license firms	SOEs
	(1)	(2)	(3)	(4)
$MFA_j \times POST_t$	0.024^a	0.038^a	0.011^b	
in ROW	(0.007)	(0.006)	(0.005)	
$MFA_j \times POST_t$	0.030^b	0.029^a	0.003	
in JANZ	(0.012)	(0.008)	(0.006)	
With SOEs as a firm-type				
$MFA_j \times POST_t$	0.027^a	0.034^a	0.017^b	0.019^a
in ROW	(0.008)	(0.006)	(0.007)	(0.006)
$MFA_j \times POST_t$	0.029^b	0.029^a	0.008	0.015^b
in JANZ	(0.013)	(0.009)	(0.010)	(0.007)

Notes: Product-destination-firm-type and year-destination-firm-type fixed effects are included in all regressions, where the countries of destination are either part of EUS, ROW, or $JANZ$. Once singletons are excluded, there are 2,163,154 observations in the first regression line, 587,269 in the second line, 2,152,515 in the third line, and 586,906 in the fourth line. Standard errors, clustered both at the HS-8 digit product level and at the firm-level, are in parentheses. a: significant at the 1 percent; b: significant at the 5 percent; c: significant at the 10 percent level.

Column 1 of Table 3 shows that firms that started to sell MFA goods in the EUS since 2005 experienced a considerable increase in entry in ROW (and $JANZ$). This likely reflects highly productive new firms (or highly productive existing firms moving to new product lines) being prompted to enter the industry by the increase in expected global profits.

Most strikingly, in column 2 we also observe a large increase of entry in ROW (and $JANZ$) of firm-product pairs that did *not* serve the EUS markets either before or after the policy change. In contrast, column 3 reveals notably smaller effects for firms that sold MFA products in the EUS prior to 2005—'license' firms. The effect in ROW is less than a third of the size of the ones obtained for firms that did not enter the EUS. The effect for license firms in $JANZ$ is very small and statistically indistinguishable from zero.

Finally, motivated by the findings of Khandelwal et al. (2013), in column 4 we distinguish firms by ownership by adding a further diff-in-diff interaction to equation (2), with *SOE*, which is one if the firm is classified as a state-owned enterprise. In that specification, the three firm status previously defined apply only to private firms. We observe entry of SOEs in *ROW* and *JANZ* driven by the policy shock, but the magnitude is just over half of the effect for private 'unconnected' firms.

5 Discussion

Our results can be interpreted as follows. The end of the MFA created a larger effective market for Chinese T&C producers. This turned China into a better export base, inducing potential entrepreneurs to enter the Chinese industry. The expansion of the production base, in turn, induced more Chinese exports not only to the *EUS*, which caused the expansion, but also to markets in *ROW*. This is the main rationale behind *the home market effect* and more general *firm de-location effects*. A key element in this view is the existence of decreasing average costs at the firm level, which induces more entry when the market accessible to domestic firms expands. In the standard modeling of this effect (Helpman and Krugman, 1989), a homogenous 'outside' sector is assumed to neutralize countervailing forces stemming from pressures from the labor/input markets. More generally, what the effect requires is that such countervailing forces are not too large to offset the original impact on entry. This requirement is especially plausible when one considers a single sector of the economy, as we do here.

This rationale can be generalized to models with heterogeneous firms and selection into exporting. In the context of Melitz and Ottaviano's (2008) model, for example, the trade policy shock that we study would lead to more entry in China and increased exports to *ROW*. The model developed by Cherkashin et al. (2015) has a similar flavor. It is based on Melitz (2003), but includes a homogeneous sector that fixes wages, so entry is not limited by rising input costs. It also features firm-market specific demand shocks. This implies that a rigid export pecking order—in which the best firms export to all viable markets, the moderately productive firms export to all but the toughest ones, and those firms that just make it to exporting sell only to the easiest markets—does not need to exist, a point made forcefully by Eaton et al. (2011). Regardless of the exact mechanism, expanded entry in China would induce more sales of MFA products to *ROW* through an expansion of the extensive margin, as our findings document.

More specifically, consider a potential entrepreneur i who is weighing whether to start the production of an MFA product. After paying a start-up fixed cost, she discovers both the firm productivity, φ^i, as well as market-specific idiosyncratic characteristics, ϕ_d^i, $d \in EUS \quad \text{and} \quad ROW$, which denotes different levels of profitability from selling the MFA good in different destinations. With this information at hand, she decides whether to enter markets in each of the two destinations.

Prior to 2005, the key qualitative difference for MFA products between the net expected profits in the two markets is the presence of a trade cost $\tau_{EUS} > 0$ per unit of sales in the EUS market. τ_{EUS} can be interpreted as the shadow cost of complying with the quota—or, equivalently, the (secondary) market price of the license to sell a unit of a restricted good in the EUS, inclusive of potential lobbying costs. Now, as Khandelwal et al. (2013) make clear, some firms (typically SOEs) managed to escape those restrictions. For politically connected firms, the quota restriction does not bind; for all other firms, selling in the EUS requires incurring the shadow cost of complying with the quota.

Since 2005, for 'unconnected' firms the policy shock increased net aggregate export profits and made entry more appealing. Consider first firms that decide to start exporting MFA goods because of the policy shock. After paying a start-up fixed cost, some of them obtain a high ϕ_{EUS}^i but a low ϕ_{ROW}^i, in which case they only enter the EUS, whereas others get a high ϕ_{ROW}^i but a low ϕ_{EUS}^i, in which case they only enter ROW—even though what motivated them to start producing MFA goods was liberalization in the EUS market. This rationalizes the hypothesis that entry in the Chinese industry, prompted by higher expected profits due to the opening of the EUS market, was a fundamental force leading to the increase in exports of MFA products (compared to non-MFA ones) at the extensive margin to ROW after the policy shock (relative to before it).[11] The best firms (high φ^i) enter both markets, as a high enough φ^i compensates for a low ϕ_d^i. This explains why we observe higher entry rates of firms not exporting MFA products before 2005 in *both* markets. That is, the liberalization in the EUS induced some firms to enter ROW, even though policy did not change there.

The change in trade barriers also affects the equilibrium conditions for entry—here, the conditions to start producing and exporting MFA products. The higher entry due to the

[11] Alternatively, EUS liberalization may have reduced the entry costs of exporting to other markets. Morales et al. (2019) develop a dynamic model in which the sunk cost of entering a destination declines when a firm has previously exported to related markets. Relatedly, Albornoz et al. (2012, 2023) argue that initial entry provides information to firms facing uncertainty about export profitability and thereby facilitates expansion into other destinations. However, column 2 of Table 3 shows increased entry into ROW even among firms that did not enter the EUS.

elimination of τ_{EUS} puts pressure on the domestic factor markets and raises production costs. This makes foreign market entry in general less appealing for connected firms that do not benefit from the elimination of τ_{EUS} but suffer from the toughening of market conditions in the industry. This explains why the entry effect is lower for license firms and SOEs.

6 Concluding remarks

Most trade policy changes are small. Some are large, but endogenous. A few are large, plausibly exogenous, but affect virtually all products in an economy. We study a trade policy change that is large, exogenous, and affects a precisely defined subset of products. This allows us to identify its firm-level effects clearly. Here, our focus is on the third-market effects of the policy change.

Our results suggest that the end of the MFA led to increased entry in the Chinese T&C industry. This, in turn, provoked an increase of Chinese exports of previously restricted products not only to the markets that imposed the restrictions, but also to markets that did not impose any quota on China. The increase happened at the extensive margin, with more firms (and more firm-product pairs) selling previously restricted products in markets where those restrictions never existed. These are generally considered to be long-run effects. A reason that can explain such relatively fast creation of new firms in China is that the T&C sector is relatively labor intensive, not requiring large, expensive outlays to start production. Furthermore, specialized labor was readily available given China's long experience in the sector. We also uncover markedly heterogeneous responses of firms: the expansion was led by privately owned firms and was more pronounced among the firms that did not export to the markets that applied the restrictions prior to the policy shock.

Our findings shed light on an underexplored dimension of trade policy: its third-market effects. The theoretical literature remains ambiguous on this channel, likely because the absence of clear, one-off, and sufficiently large policy shocks has limited the empirical screening of competing hypotheses. We show that such effects are substantial. This matters. Large trade blocs that promise deep liberalization among members can generate sizeable spillovers to their exports to non-members. Even more pressing is understanding the global implications of a retreat into protectionism by the world's largest economy. Our findings suggest that this shift may reduce entry into foreign markets broadly, not only in the protectionist economy itself, potentially producing a larger contraction in global trade than many anticipate.

References

Albornoz, Facundo, Irene Brambilla and Emanuel Ornelas (2025). "Firm Export Responses to Tariff Hikes." Mimeo.

Albornoz, Facundo, Hector Calvo-Pardo, Gregory Corcos and Emanuel Ornelas (2023). "Sequentially Exporting Products across Countries." *Journal of International Economics* 142, 103735.

Albornoz, Facundo, Hector Calvo-Pardo, Gregory Corcos and Emanuel Ornelas (2012). "Sequential exporting." *Journal of International Economics* 88, 17-31.

Albornoz, Facundo, Sebastián Fanelli and Juan C. Hallak (2016). "Survival in export markets." *Journal of International Economics* 102, 262-281.

Alessandria, George, Costas Arkolakis and Kim J. Ruhl (2021). "Firm Dynamics and Trade." *Annual Review of Economics* 13 (1), 253-280.

Alfaro-Urena, Alonso, Juan M. Castro-Vincenzi, Sebastian Fanelli and Eduardo Morales (2023). "Firm Export Dynamics in Interdependent Markets." NBER wp 31610.

Almunia, Miguel, Pol Antras, David Lopez-Rodriguez and Eduardo Morales (2021). "Venting Out: Exports during a Domestic Slump." *American Economic Review* 111(11), 3611-3662.

Berman, Nicolas, Antoine Berthou and Jerome Hericourt (2015). "Export dynamics and sales at home." *Journal of International Economics* 96(2), 298-310.

Bernard, Andrew, J. Bradford Jensen, Stephen Redding, Peter Schott (2018). "Global Firms." *Journal of Economic Literature* 56(2), 565–619.

Bloom Nicholas, Mirko Draca, John Van Reenen (2016). "Trade induced technical change? The impact of Chinese imports on innovation, IT and productivity." *Review of Economic Studies* 83(1): 87-117.

Blum, Bernardo S., Sebastián Claro, and Ignatius J. Horstmann (2013). "Occasional and perennial exporters." *Journal of International Economics* 90(1), 65-74.

Bown, Chad and Meredith Crowley (2007). "Trade deflection and trade depression." *Journal of International Economics* 72, 176-201.

Bown, Chad and Meredith Crowley (2010). "China's export growth and the China safeguard: threats to the world trading system?" *Canadian Journal of Economics* 43(4), 1353-1388.

Brambilla, Irene, Amit Khandelwal and Peter Schott (2010). "China's Experience under the Multi-Fiber Arrangement (MFA) and the Agreement on Textiles and Clothing (ATC)." In Robert C. Feenstra and Shang-Jin Wei (eds.), *China's Growing Role in World Trade*, 345-387, Chicago: University of Chicago Press.

Cherkashin, Ivan, Svetlana Demidova, Hiau Looi Kee and Kala Krishna (2015). "Firm Heterogeneity and Costly Trade: A New Estimation Strategy and Policy Experiments." *Journal of International Economics* 96(1), 18-36.

Defever, Fabrice, Benedikt Heid, and Mario Larch (2015). "Spatial Exporters." *Journal of International Economics* 95(1), 145-156.

Eaton, Jonathan, Samuel Kortum and Francis Kramarz (2011). "An Anatomy of International Trade: Evidence From French Firms." *Econometrica* 79 (5), 1453-1498.

Evans, Carolyn and James Harrigan (2005). "Tight clothing: How the MFA affects apparel exports." In T. Ito and A. Rose (eds.), *International trade in East Asia*, 367-90. Chicago: University of Chicago Press.

Feenstra, Robert C. and Gordon H. Hanson (2004). "Intermediaries in Entrepot Trade: Hong Kong Re-Exports of Chinese Goods." *Journal of Economics & Management Strategy* 13(1), 3-35.

Francois, Joseph (2010). "Comment on 'China's Experience under the Multi-Fiber Arrangement (MFA) and the Agreement on Textiles and Clothing (ATC)'." In Robert C. Feenstra and Shang-Jin Wei (eds.), *China's Growing Role in World Trade*, 387-395, Chicago: University of Chicago Press.

Freund, C. and E. Ornelas (2010). "Regional Trade Agreements." *Annual Review of Economics* 2, 139-167.

Harrigan, James and Geoffrey Barrows (2009). "Testing the Theory of Trade Policy: Evidence from the Abrupt End of the Multifiber Arrangement." *Review of Economics and Statistics* 91, 282-294.

Helpman, E. and P. Krugman (1989). *Trade Policy and Market Structure*. Cambridge, MA: MIT Press.

Khandelwal, Amit, Peter Schott and Shang-Jin Wei (2013). "Trade Liberalization and Embedded Institutional Reform: Evidence from Chinese Exporters." *American Economic Review* 103(6), 2169-95.

Lee, Woori, Alen Mulabdic and Michele Ruta (2023). "Third-country effects of regional trade agreements: A firm-level analysis." *Journal of International Economics* 140, 103688.

Manova, Kalina and Zhiwei Zhang (2012). "Export Prices across Firms and Destinations." *Quarterly Journal of Economics* 127, 379-436.

Medina, Pamela (2024). "Import Competition, Quality Upgrading, and Exporting: Evidence from the Peruvian Apparel Industry." *Review of Economics and Statistics* 106 (5): 1285–1300.

Melitz, Marc (2003). "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity." *Econometrica* 71, 1695-1725.

Melitz, Marc and Gianmarco Ottaviano (2008). "Market Size, Trade, and Productivity." *Review of Economic Studies* 75(1), 295-316.

Morales, Eduardo, Gloria Sheu and Andres Zahler (2019). "Extended Gravity." *Review of Economic Studies* 86(6), 2668-2712.

Naumann, Eckart (2006). "The Multifibre Agreement – WTO Agreement on Textiles and Clothing." *Tralac* Working Paper No 4/2006.

Nordås, Hildegunn Kyvik (2004). "The Global Textile and Clothing Industry post the Agreement on Textiles and Clothing." World Trade Organization Discussion Paper 05.

Rotunno, Lorenzo, Pierre-Louis Vézina and Zheng Wang (2013). "The rise and fall of (Chinese) African apparel exports." *Journal of Development Economics* 105, 152-163.

Utar, Hale (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.

Online Appendix
(Not for publication)

Trade Liberalization and Third-Market Effects

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A Theoretical Background

A.1 Extensive margin

A firm makes two types of decisions at the extensive margin. First, whether to produce a certain product. Second, whether to sell a product that it produces at different foreign destinations. Our goal here is to understand how the policy shock affected those decisions.

Consider a potential entrepreneur i who is weighing whether to start the production of an MFA product.[12] To do so, she would first need to pay a start-up fixed cost f_e (defined on a per-period basis). Once she pays f_e, she draws a vector of firm-product characteristics, which for simplicity we denote as a scalar measuring firm productivity, φ^i. She also learns her market-specific idiosyncratic characteristics, ϕ_d^i, $d = EUS$, ROW, which denotes different levels of profitability from selling the MFA good in different destinations (for ease of exposition, we ignore profits in the domestic market). Observe that, while φ^i affects firm i's operational profits in all markets, ϕ_d^i affects firm i's operational profit in market d only.

Once the firm has paid f_e and learned its productivity and market-specific characteristics, it decides whether to enter each of the two destinations in our analysis. It chooses to enter market d if its operational profit there, net of trade costs, and evaluated at the optimal quantity and price, $\pi_d(\varphi^i, \phi^i_{ROW})$, is greater than the fixed entry cost in that market, f_d (also defined on a per-period basis).

Thus, *prior to 2005*, the firm chooses to pay f_e to acquire the capability to produce an MFA good if expected aggregate export profits more than compensate for the entry costs. That is, if

$$\max\left\{E\left[\pi_{ROW}(\varphi^i, \phi^i_{ROW}) - f_{ROW}\right], 0\right\} + \max\left\{E\left[\pi_{EUS}(\varphi^i, \phi^i_{EUS}) - (1-\eta^i)\tau_{EUS} q^i_{EUS}(\varphi^i, \phi^i_{EUS}) - f_{EUS}\right], 0\right\} \geq f_e, \quad (3)$$

where q_d^i represents the (optimal) quantity sold by firm i in market $d = EUS$, ROW and E denotes the expectation operator over the productivity draw φ^i and the firm-market specific shocks $\{\phi_d^i\}$, which are ex-ante unknown to the entrepreneur. The key qualitative difference between the net expected profits in the two markets is the presence of the trade cost $\tau_{EUS} > 0$ per unit of sales in the EUS market. τ_{EUS} can be interpreted as the shadow cost of complying with the quota—or, equivalently, the (secondary) market price of the license to sell a unit of a restricted good in the EUS, inclusive of potential lobbying costs. Now, as Khandelwal et al. (2013) make clear, some firms (typically SOEs) managed to escape those restrictions. Such a "political connectedness" is represented here by parameter η^i. For connected firms, $\eta^i = 1$ and the quota restriction does not bind; for all other firms, $\eta^i = 0$ and selling in the EUS requires incurring τ_{EUS}.

In equilibrium, with $\partial \pi_d^i(\varphi^i, \phi_d^i)/\partial \varphi^i > 0$, for given ϕ_d^i there will typically be a marginal firm selling in each market d such that $\pi_d^i(\varphi^*, \phi_d^i) = f_d$, with all firms with $\varphi^i \geq \varphi^*$ serving

[12] Here, we refer indistinguishably to "new firms" and to "existing firms starting to produce a new good."

market d. However, in the EUS before 2005 our context differs from the typical setting in that the productivity cutoff also depends on η^i, with $\varphi^*_{EUS<2005}(\eta^i = 1) < \varphi^*_{EUS<2005}(\eta^i = 0)$: firms did not need to be as productive to enter the EUS if they were politically connected.

Our focus is on the changes in entry behavior due to the elimination of the quota system. In the framework above, this can be represented by setting $\tau_{EUS} = 0$ in the post-2005 period.[13] This reduces (3) to

$$\max\left\{E\left[\pi_{ROW}(\varphi^i, \phi^i_{ROW}) - f_{ROW}\right], 0\right\} + \max\left\{E\left[\pi_{EUS}(\varphi^i, \phi^i_{EUS}) - f_{EUS}\right], 0\right\} \geq f_e. \quad (4)$$

If $\eta^i = 0$, the left-hand side of (4) is unambiguously higher than the left-hand side of (3). Hence, for those firms the policy shock increased net aggregate export profits and made entry more appealing. Thus, we should expect an increase in the number of 'unconnected' firms acquiring the capacity to produce (and export) MFA products after the policy shock.

The change in trade barriers also affects the equilibrium conditions for entry—here, the conditions to start producing MFA products. According to standard models of heterogeneous firms, the higher entry due to the elimination of τ_{EUS} will put pressure on the domestic factors market and raise production costs. This will make foreign market entry in general less appealing for 'connected' ($\eta^i = 1$) firms that do not benefit from the elimination of τ_{EUS} but suffer from tougher market conditions in the industry. Thus, we should expect a decrease in the number of 'connected' firms acquiring the capacity to produce (and export) MFA products after the policy shock. Note, however, that we cannot directly observe η^i. Instead, we rely on the argument that SOEs and firms selling MFA goods to the EUS prior to 2005 are more likely to be 'connected' (according to Khandelwal et al., 2013), and we therefore treat them as having $\eta^i = 1$.

Now, whether a new firm i (or, more precisely, a new firm-product pair) actually enters market d depends on its specific draws, $\{\varphi^i, \phi^i_{ROW}, \phi^i_{EUS}\}$. Consider the problem of a producer of MFA products in China contemplating entry into one of the two export destinations in our analysis prior to 2005. It chooses to enter the EUS if

$$\pi_{EUS}(\varphi^i, \phi^i_{EUS}) - (1 - \eta^i)\tau_{EUS} q^i_{EUS}(\varphi^i, \phi^i_{EUS}) \geq f_{EUS}, \quad (5)$$

whereas it chooses to enter ROW if

$$\pi_{ROW}(\varphi^i, \phi^i_{ROW}) \geq f_{ROW}. \quad (6)$$

After the policy shock, for both $d = EUS$, ROW, the condition is

$$\pi_d(\varphi^i, \phi^i_d) \geq f_d. \quad (7)$$

The trade restriction in the EUS, τ_{EUS}, no longer applies.

[13] For simplicity, we treat the policy shock as if it were simply a reduction of the trade barriers faced by Chinese exporters in the EUS markets. In reality, the elimination of quotas was not only against China, but vis-à-vis a large group of countries that faced quotas. However, as our previous discussion highlights, China was by far the country most constrained by quotas.

Consider first firms that decide to start producing MFA goods as a result of the policy shock. Some of them obtain a high ϕ^i_{EUS} but a low ϕ^i_{ROW}, in which case they only enter the EUS, whereas others get a high ϕ^i_{ROW} but a low ϕ^i_{EUS}, in which case they only enter ROW—even though what motivated them to start producing MFA goods was liberalization in the EUS market. The best ones (high φ^i) enter both markets, as a high enough φ^i compensates for a low ϕ^i_d. Hence, we should expect higher entry rates of firms not exporting MFA products before 2005 in *both* markets. That is, the liberalization in the EUS will induce some firms to enter ROW, even though policy did not change there.

Now, since the industry restructuring raises the productivity cutoff for entry, we should expect lower entry rates in ROW by firms previously serving only the EUS. Since they are more likely to have been connected firms, which sold to the EUS only because they were shielded from competition, they were less productive on average. Hence, in ROW we expect a positive effect on entry rates that is driven mostly by firms that did not previously sell MFA goods in the EUS.

The restructuring of the Chinese economy also tends to affect the exit pattern of incumbent firms. In the EUS, the direct effect of the liberalization is to lower exit rates. On the other hand, general equilibrium forces that make survival in the market harder tend to have the opposite effect. In ROW, the latter are the only effects.

A.2 Intensive Margin

We now turn to the intensive-margin effects. Observe that, to estimate within-firm intensive-margin effects in a market, the analysis considers only firms serving that market both before and after the policy shock. Hence, the estimates do not reflect the behavior of the firms driven out of the market and of those that enter because of the restructuring of the Chinese industry, only that of the (presumably) more productive, surviving firms.

Prior to 2005, the problem of a firm i that exports MFA products from China to the EUS can be described as

$$\max_{q^i_{EUS}(\varphi^i,\phi^i_{EUS})} r^i_{EUS}(q^i_{EUS}(\varphi^i,\phi^i_{EUS})) - c_i\left(q^i_{EUS}(\varphi^i,\phi^i_{EUS}) + q^i_{ROW}(\varphi^i,\phi^i_{ROW})\right) - (1-\eta^i)\tau_{EUS}q^i_{EUS}(\varphi^i,\phi^i_{EUS}),$$

where $r^i_{EUS}(.)$ is firm i's residual revenue function in the EUS selling q^i_{EUS} and $c_i(.)$ is firm i's cost function, whose general formulation varies with total production, thus allowing for variable returns to scale. Analogously, firm i's problem in ROW is

$$\max_{q^i_{ROW}(\varphi^i,\phi^i_{ROW})} r^i_{ROW}(q^i_{ROW}(\varphi^i,\phi^i_{ROW})) - c_i\left(q^i_{EUS}(\varphi^i,\phi^i_{EUS}) + q^i_{ROW}(\varphi^i,\phi^i_{ROW})\right).$$

If the firm chooses to sell strictly positive quantities in both markets before 2005, the associated first-order necessary conditions are

$$\begin{cases} r^{i\prime}_{EUS}(q_{i,EUS}(\varphi,\eta)) = c'_i\left(q^i_{EUS}(\varphi^i,\phi^i_{EUS}) + q^i_{ROW}(\varphi^i,\phi^i_{ROW})\right) + (1-\eta^i)\tau_{EUS} \\ r^{i\prime}_{ROW}(q^i_{ROW}(\varphi^i,\phi^i_{ROW})) = c'_i\left(q^i_{EUS}(\varphi^i,\phi^i_{EUS}) + q^i_{ROW}(\varphi^i,\phi^i_{ROW})\right) \end{cases}.$$

With the policy shock, $\tau_{EUS} = 0$. This has general equilibrium implications in both markets, which in the firm's problem manifests through changes in $r_d^{i\prime}$. Since those changes affect all firms similarly, to identify heterogeneous effects the focus should be on either η^i or c_i'.

In the EUS, the policy shock lowers the exporting costs for all firms with $\eta^i = 0$. Thus, among continuing firms serving the EUS, we expect those to be the ones expanding the most due to the quota lift. Conversely, the policy change brings about no direct benefit for firms with $\eta^i = 1$. On average, then, we should expect an increase in the sales of continuous exporters to the EUS.

For the continuing firms in ROW, the policy shock brings no direct effect but there may be indirect, general equilibrium effects. We again distinguish them depending on their involvement in the EUS, as in the extensive-margin analysis. For firms with no sales to the EUS, either before or after the policy shock, the relevant first-order condition, both before and after 2005, is

$$r_{ROW}^{i\prime}(q_{ROW}^i(\varphi^i, \phi_{ROW}^i)) = c_i' \left(q_{ROW}^i(\varphi^i, \phi_{ROW}^i)\right).$$

Hence, except for possible general equilibrium repercussions of the policy shock in ROW, nothing changed for those firms.

Now, for firms with involvement in the EUS, the intensive-margin effect depends on the curvature of the cost function.[14] Suppose, for example, that there are constraints to the expansion of production. This could be represented with a production technology that displays increasing marginal costs, as in Bown and Crowley (2007). Such decreasing returns may reflect, for example, capacity or financial constraints. For firms entering (or expanding in) the EUS after liberalization, such firm-level constraints would induce a downward intensive-margin adjustment in ROW: $\Delta q_{ROW}^i < 0$. By contrast, there could be factors leading to increasing returns to scale at the firm level. A larger scale, made possible by the opening of the EUS markets, could allow more specialization within firms. Perhaps more importantly, it could induce investment in new machinery, other types of cost-reducing innovation, or better ways of organizing production that are worthwhile only if production is sufficiently large.[15] For firms entering (or expanding in) the EUS after liberalization, such increasing returns at the firm-level would lead to an upward intensive-margin adjustment in ROW: $\Delta q_{ROW}^i > 0$. Overall, then, the impact at the intensive margin for exporters to ROW is theoretically ambiguous.

[14] Observe that, at least among single-product firms, we should not observe heterogeneous effects on the flow of exports of MFA products from China to ROW after the end of the MFA if technology exhibited constant returns to scale. Observe also that any constraint leading to increasing marginal costs in the industry, including pressures from the labor/input markets, would yield a negative effect on the exports from China to ROW. However, since MFA and non-MFA products are similar in their input requirements, both control and treated groups would be similarly affected.

[15] See, for example, the analysis of Lileeva and Trefler (2010) of the adjustment of Canadian firms following the US-Canada free trade agreement.

B Robustness tables

We now scrutinize the positive third-market entry results further, as there are confounding factors that may be driving them. Table B.1 presents different additional robustness exercises using the entry dummy as our dependent variable.

Aggregation: In column (1), all countries of destinations are aggregated in a single destination, which is either EUS, ROW or $JANZ$. The estimated coefficients change very little with that aggregation.

Excluding safeguard products: The negotiations leading to the accession of China to the WTO in late 2001 resulted in the US and the EU being granted product-specific safeguard mechanisms that could be used in case of import surges. Indeed, both re-imposed quotas on some Chinese imports in the second half of 2005, which had to be phased out until 2008. Based on overall trade volumes, the restrictions imposed in 2005 do not seem to have been very effective (Harrigan and Barrows, 2009).[16] Nevertheless, producers may have redirected sales to other markets after the imposition of the safeguards, and our results could be picking that up. As a robustness exercise, we exclude from our sample all safeguard-protected products. The estimates of our main independent variable hardly change when we introduce this restriction.

Excluding agent firms: The raw data contains a number of trading agents ("intermediary firms") that mediate trade for other firms but do not directly engage in production. Including these firms could cause problems as their behavior is probably different from that of manufacturing firms. To exclude the possibility that our results are driven by these trading agents, we exclude firms that are identified by certain keywords in their names. Following Ahn et al. (2011), we use a comprehensive list of keywords that are typically used by various kinds of trading agents in China. These trading companies are responsible for about forty percent of our observations. Nevertheless, dropping trading agents does not change our conclusions of a positive entry into EUS, ROW and $JANZ$.

Excluding processing trade: Each product-destination transaction also includes the customs regimes under which products were exported. The most frequent regimes are ordinary trade and processing trade (associated with either assembly or imported materials). Including transactions undertaken using processing trade may be problematic as this customs regime is subject to different tariff levels and potentially to a preferential treatment when exporting. Excluding processing trade export transactions, as in column 4, leads to a decrease in the number of observations of about 12% of the original sample. Our results on entry are again qualitatively similar to our baseline results.

[16] Despite the implementation of a new license system, China restricted neither the number of the licenses nor the volume of exports. In addition, EU retailers used their last chance to import Chinese textile products before the quota re-instatement, yielding a surge in orders. Only two months after the signing of this agreement, import quotas were breached and 80 million T&C items got stuck in European ports. A diplomatic resolution was reached at the beginning of September 2005 putting an end to a situation the British press alluded to as the "Bra Wars." The new agreement included more product categories and relaxed the 2005 quota limits. It was eventually decided that the 2005 quota surplus could be used against the 2006 quotas.

Table B.1: Robustness on Entry

	Aggregate	Drop Safeguard products	Drop Agent firms	Drop Processing trade
	(1)	(2)	(3)	(4)
$MFA_j \times POST_t$	0.083^a	0.075^a	0.082^a	0.080^a
in EUS	(0.008)	(0.009)	(0.010)	(0.009)
$MFA_j \times POST_t$	0.031^a	0.022^a	0.027^a	0.028^a
in ROW	(0.005)	(0.005)	(0.006)	(0.005)
$MFA_j \times POST_t$	0.023^a	0.026^a	0.017^a	0.028^a
in JANZ	(0.006)	(0.007)	(0.007)	(0.007)

Notes: Product-destination and year-destination fixed effects are included in all regressions, where the countries of destination are either part of EUS, ROW, or $JANZ$, except in column (1) where all countries of destinations have been aggregated in a single destination, which is either EUS, ROW, or $JANZ$. When we aggregate the data (column 1), once singletons are excluded, there are 702,791 observations in EUS, 1,353,954 in ROW, 533,627 in $JANZ$. When dropping Safeguard products (column 2), once singletons are excluded, there are 890,834 observations in EUS, 1,475,746 in ROW, and 408,563 in $JANZ$. When dropping Agent firms (column 3), once singletons are excluded, there are 561,058 observations in EUS, 1,065,654 in ROW and 331,283 in $JANZ$. When dropping Processing trade (column 4), once singletons are excluded, there are 1,085,682 observations in EUS, 1,919,617 in ROW and 475,092 in $JANZ$. Standard errors, clustered both at the HS-8 digit product level and at the firm-level, are in parentheses. *a*: significant at the 1 percent; *b*: significant at the 5 percent; *c*: significant at the 10 percent level.

Table B.2: Robustness on the intensive margin - Continuous exporters

	Aggregate	Drop Safeguard products	Drop Agent firms	Drop Processing trade
	(1)	(2)	(3)	(4)
			$\triangle \log(value)$	
$MFA_j \times POST_t$	0.294^a	0.152^a	0.113^b	0.136^a
in EUS	(0.052)	(0.055)	(0.051)	(0.047)
$MFA_j \times POST_t$	0.043	-0.011	0.030	0.018
in ROW	(0.029)	(0.034)	(0.028)	(0.034)
$MFA_j \times POST_t$	0.039	-0.009	0.062^c	0.050
in JANZ	(0.037)	(0.042)	(0.035)	(0.045)
			$\triangle \log(price)$	
$MFA_j \times POST_t$	-0.027^b	-0.034^c	-0.004	-0.042^b
in EUS	(0.012)	(0.018)	(0.028)	(0.018)
$MFA_j \times POST_t$	0.002	0.001	0.005	0.006
in ROW	(0.008)	(0.009)	(0.009)	(0.010)
$MFA_j \times POST_t$	-0.003	-0.009	0.004	0.006
in JANZ	(0.010)	(0.011)	(0.011)	(0.011)

Notes: Where the countries of destination are either part of EUS, ROW, or $JANZ$, except in column (1) where all countries of destinations have been aggregate in a single destination, which is either EUS, ROW, or $JANZ$. When we aggregate the data (column 1), once singletons are excluded, there are 78,862 observations in EUS, 160,800 in ROW, 85,144 in $JANZ$. When dropping Safeguard products (column 2), once singletons are excluded, there are 23,560 observations in EUS, 49,592 in ROW, and 32,512 in $JANZ$. When dropping Agent firms (column 3), once singletons are excluded, there are 13,412 observations in EUS, 48,728 in ROW and 34,084 in $JANZ$. When dropping Processing trade (column 4), once singletons are excluded, there are 29,563 observations in EUS, 56,186 in ROW and 35,657 in $JANZ$. Standard errors, clustered both at the HS-8 digit product level and at the firm-level, are in parentheses. a: significant at the 1 percent; b: significant at the 5 percent; c: significant at the 10 percent level.

References

Ahn, JaeBin, Amit Khandelwal and Shang-Jin Wei (2011). "The Role of Intermediaries in Facilitating Trade." *Journal of International Economics* 84(1), 73-85.

Bown, Chad and Meredith Crowley (2007). "Trade deflection and trade depression." *Journal of International Economics* 72, 176-201.

Harrigan, James and Geoffrey Barrows (2009). "Testing the Theory of Trade Policy: Evidence from the Abrupt End of the Multifiber Arrangement." *Review of Economics and Statistics* 91, 282-294.

Khandelwal, Amit, Peter Schott and Shang-Jin Wei (2013). "Trade Liberalization and Embedded Institutional Reform: Evidence from Chinese Exporters." *American Economic Review* 103(6), 2169-95.

Lileeva, Alla and Daniel Trefler (2010). "Improved Access to Foreign Markets Raises Plant-level Productivity...for Some Plants." *Quarterly Journal of Economics* 125(3), 1051-1099.