The rise and fall of (Chinese) African exports

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Abstract

During the Multifibre Agreement (MFA) the US imposed strict import quotas on Chinese apparel and gave duty- and quota-free access to apparel from some African countries. The combination of these policies led to a rapid rise of exports from Africa until the end of the MFA in 2004. In this paper we argue that the African success was actually a temporary trade diversion of Chinese apparel. We first show that Chinese apparel exports to African countries predict US imports from the same countries and in the same apparel categories but only for apparel products with binding quotas in the US and for countries with preferential access to the US. We show that African countries imported very little primary inputs but rather finished products with little assembly work left to do. We then show that there was very little value added in these re-exported products, confirming little assembly work was done along the transhipment route.

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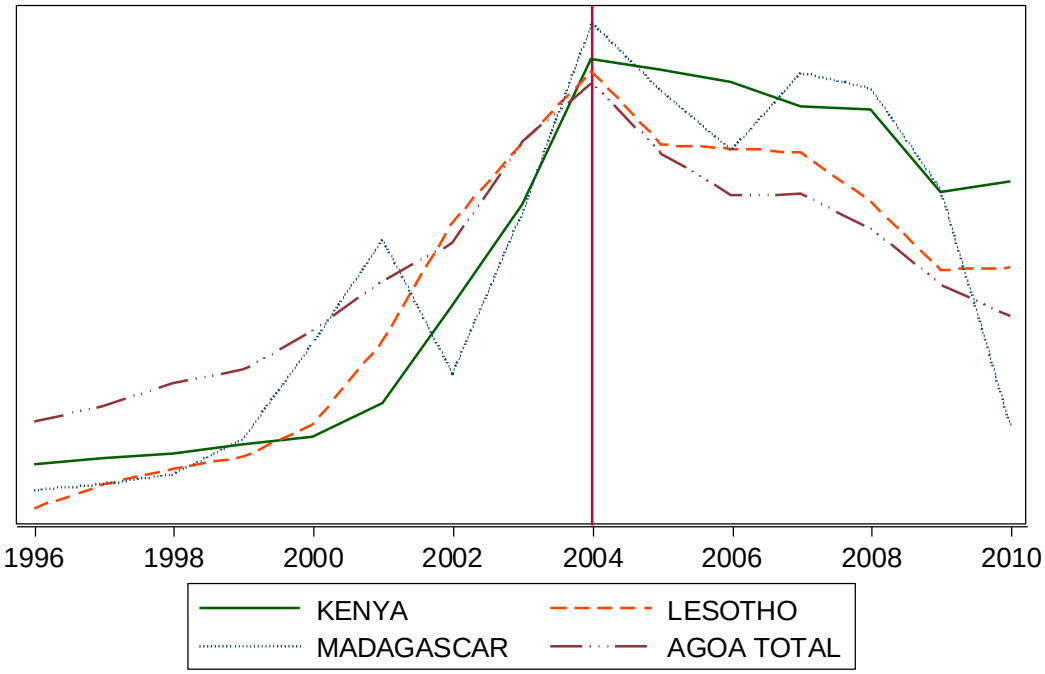
Introduction

The rapid success of African apparel exporters following the launch in 2000 of the African Growth and Opportunity Act (AGOA), which enabled African countries to export over 4,000 products, including hundreds of apparel products, quota-free and duty-free to the US, has been the object of much trade research. Collier and Venables (2007) and Frazer and van Biesebroeck (2010) both find that the preferences had a positive and significant impact on AGOA exports. Yet this success has not survived the demise of the Multifibre Agreement in 2005 (Figure 1), when Chinese competition took over (Harrigan and Barrows 2009), and has not been accompanied by dynamic growth benefits (Edwards and Lawrence 2010).

Figure 1. Rise and fall of AGOA apparel exports



Note: Kenya, Madagascar and Lesotho were the three biggest exporters of apparel among AGOA countries during 2000-2004. The exports are shown at different scales. AGOA started in October 2000 and the MFA ended on 1 Jan 2005.

In this paper we argue this success was short-lived as it was merely a temporary trade diversion of Chinese apparel exports. The launch of AGOA coincided with the final years of the Multifibre Agreement (MFA) and its successor, the Agreement on Textile and Clothing (ATC), during which severe import quotas were imposed on Chinese textile products. As highlighted by Brambilla et al. (2010), the MFA regime guaranteed smaller developing countries access to the US market. This

implicit export subsidy for African countries, coupled with AGOA preferences, was thus a golden ticket for apparel exporters. However, the unconstrained rules of origin (ROOs), which are behind the success of AGOA according to Collier and Venables (2007), provided an opportunity for Chinese exporters to merely tranship their products via AGOA to avoid MFA quotas and on top benefit from AGOA preferences, making the transhipment worthwhile.

The AGOA and MFA policies indeed spurred an Asian textile manufacturing wave in Africa, as documented by a recent literature as well as news reports. Taiwan Economic News (2005) reports that, "thanks to AGOA… Taiwan's textile manufacturers have stampeded to establish footholds in Africa... [with] more than 30 Taiwanese textile factories in Africa, mainly in Lesotho and Swaziland." Traub-Merz (2006) and Zafar (2007) note that Chinese factories in several African countries had been set up to take advantage of easy African access to the US market under AGOA and that exports have been concentrated in formerly quota-restrained products, such as basic trousers, t-shirts, and sweaters. Rolfe and Woodward (2005) confirm that 99% of exports from the five most AGOA-successful countries were covered by US quotas on India and China. Kaplinsky and Morris (2008) and Nal and Muchie (undated) also point out that Asian garment firms established plants in Africa to take advantage of MFA quotas. De Voest (2002) surveyed Chinese private firms to identify the factors leading them to invest and operate in Africa and found that taking advantage of international trade agreements was a top-five motive. He also documents that the Taiwanese clothing firms in Lesotho relied on imports of textile, fabric and related intermediate goods from China, with 93% of material input coming from network sources in Asia where China constitutes the major supplier. Similarly, Rolfe and Woodward (2005) find that the value of local component in Kenyan apparel exports is just 3% of its sales value. In the Kenyan Export Processing Zone, 80% of the 34 garment plants had Asian owners.

Edwards and Lawrence (2010) describe the experience of Lesotho firms which, "almost entirely foreign owned, typically provide assembly, packaging and shipping services and depend on their Asian headquarters to generate orders, design the clothes, and send them the fabric they need". They argue that MFA quotas induced the export of low-value added, fabric intensive and low-priced clothing. This is because the implicit subsidy of the quota is greater the smaller the value added and is a greater share of the overall value the lower is the price of the product.

Unlike Edwards and Lawrence (2010) who argue that product selection was done according to varying implicit subsidies, we argue the selection was due to quota hopping by Chinese firms and that the

possibility to use Chinese almost-finished products explains why little value was added in Africa. We thus suggest that Chinese transhipment explains why little spillovers occurred and why 2005 was the beginning of the end. In this paper we show empirically that the AGOA success was a mere diversion in the route from China to the US. More precisely, we show that Chinese apparel exports to AGOA, defined at the 6-digit level in the HS classification, predict AGOA exports, both within country-products and across time. We show that this correlation holds only in countries which were eligible to export apparel to the US under AGOA and for US-quota-binding products, which were the ones China couldn't export directly. In other words, we find the strongest indication of transhipment where incentives are highest and where transhipment was legally possible. As a placebo, we show that apparel exports from the rest of the world, or from any of the world's top 5 apparel exporters, have no prediction power. Using this 'transhipment' equation, we estimate that direct transhipment accounted for a large share of AGOA exports, e.g. as much as 24% of Botswana's exports and 14% of Kenya's.

We also use the US Input-Output matrix to show that AGOA countries did not import the inputs that would have been required to produce their apparel exports but rather imported finished products with little work remaining. We then compare the unit values of Chinese exports to AGOA to those of US imports from AGOA to estimate the value added in AGOA. We estimate that on average, the 'screwdriver plants' only added $1.6 per item (excluding Mauritius and South Africa), or about 40% of the item's value.

In a last section we discuss the possibility that this transhipment must have been, at least in part, illegal. While a burgeoning illicit-trade literature identifies tariff evasion through underinvoicing (e.g. Fisman and Wei 2004, Javorcik and Narciso 2008, Mishra et al. 2008), we describe a further channel, i.e. transhipment, through which exporters may dodge trade restrictions, here US quotas.

Our paper provides evidence on the unintended consequences of economic policies, here the transhipment that resulted from the combination of US quotas against China and preferences for Africa. This transhipment explains the surprisingly large and robust impact AGOA had on apparel imports into the US even though almost no eligible countries faced import quotas beforehand and why countries with high corruption or poor rule of law were equally able to take advantage of AGOA as countries with better institutions (Frazer and van Biesebroeck 2010).

In the next section we go over the details of the AGOA transhipment route and present our empirical strategy. Section 3 describes the data, section 4 the results, and the last section concludes.

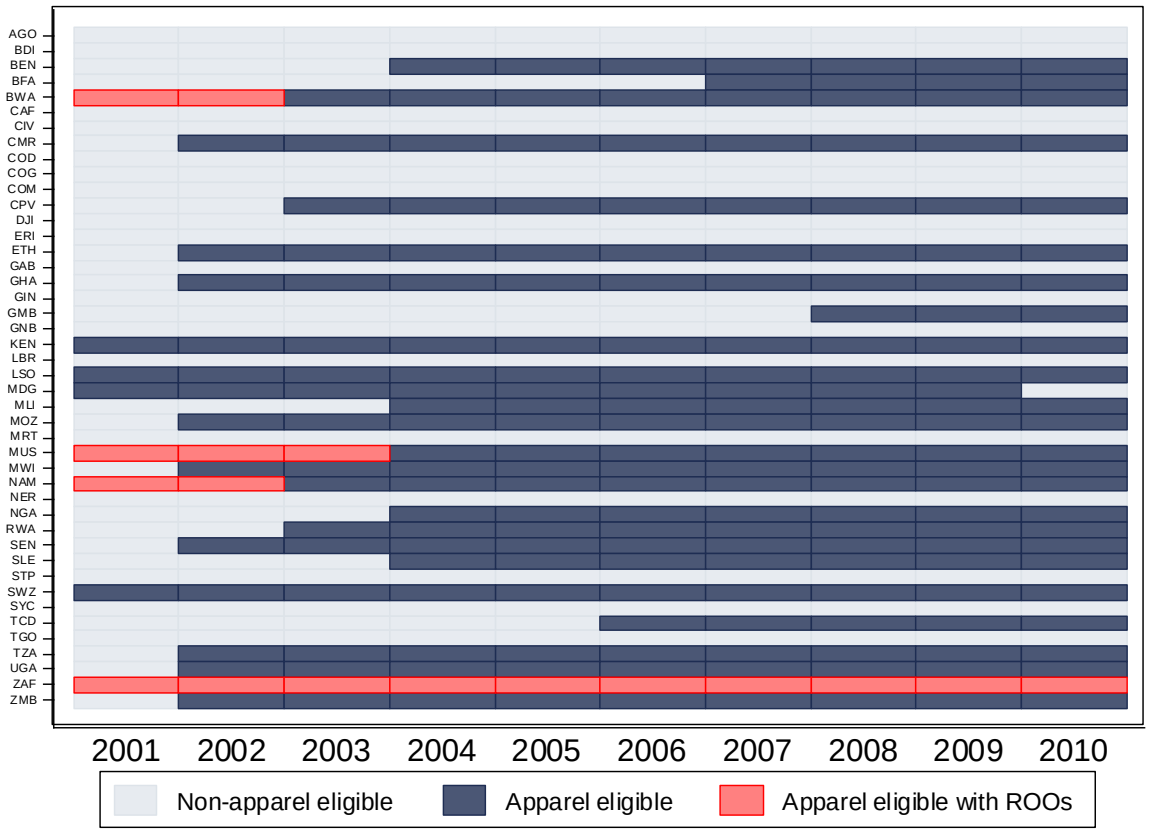
Tracing transhipment: Empirical strategy

During the MFA, the US granted AGOA beneficiaries duty- and quota-free access to the US for around 4000 products including apparel under the "AGOA Apparel" provision[4]. However, not all countries became eligible for the AGOA Apparel provision. Countries had to be certified as having complied for the 'Wearing Apparel' provisions which entail having taken adequate steps to "establish effective product visa systems to prevent illegal transhipment and the use of counterfeit documentation, as well as having instituted required enforcement and verification procedures". What's more, only lesser-developed countries could benefit from a special rule ("3rd country fabric") that allowed exports to enter the US without any rules of origin on the source of fabrics or other inputs. The only requirement was for the products to be assembled in AGOA[5]. AGOA membership and apparel eligibility in 2011 is summarized in Figure 1.

[4] The products in the Apparel provision list are HS categories 61 and 62 (apparel and clothing, knitted or not knitted), and HS headings 6501, 6502, 6503, 6504 (hats and other headgears). Source: ustr.gov. Hat tip: Jo Van Biesebroeck.

[5] In 2004, only South Africa still faced strict rules of origin as these were removed for Namibia and Botswana in 2003 and for Mauritius in 2004.

Figure 1. AGOA eligibility and Apparel Certification



This scheme created incentives for Chinese exporters to tranship their products through AGOA and access the US market duty-free and quota-free. While Chinese exporters could circumvent quota restrictions by filling unused quotas of other MFA countries or through non-MFA countries paying the Most-Favored-Nation (MFN) tariff, the AGOA Apparel provision provided duty- and quota-free treatment on top, further lowering trade costs, and probably making transhipment worthwhile.

We first suggest that transhipment can be observed in the correlation between imports from China and exports to the US. The idea is that if transhipment occurred, the same products that are imported in the African country are exported to the US. If this indeed captures transhipment, it should be highest where transhipment incentives are highest, i.e. in products facing binding quotas in the US and in AGOA countries certified for apparel exports. We thus run the following regression:

$$USimp_{i,j,t} = \beta_T (Chinaex_{i,j,t} \times Fillrate_{i,j,t} \times Eligible_{j,t}) + \beta_1 Terms_{i,j,t} + FE + \varepsilon_{i,j,t} \quad (1)$$

where *i* indexes the HS6 apparel product line, *j* denotes the AGOA country and *t* the year. $USimp$ are US imports from the AGOA country and $Chinaex$ are Chinese exports to the AGOA country. $Eligible_{j,t}$ equals one if a country is eligible for the AGOA Apparel provision in a given year, and $Fillrate_{i,t}$ is the US quota fill rate of the Chinese apparel product, which measures the extent to which the quota was binding. All regression models are fully saturated, so that $Terms_{i,j,t}$ is a matrix including all other interactions (e.g., $Fillrate_{i,t} \times Eligible_{j,t}$) and main effects that vary across products, countries and years. Other terms that vary only across two or one dimensions are either included in the regressions explicitly or absorbed by the fixed effects. The term *FE* here captures country-product and country-year fixed effects. We focus only on finished apparel products included in the AGOA apparel provision. According to our identification strategy, we expect to find $\beta_T \rangle 0$ if transhipment indeed occurred. Before turning to our results in the next section we first describe the data used in our regressions.

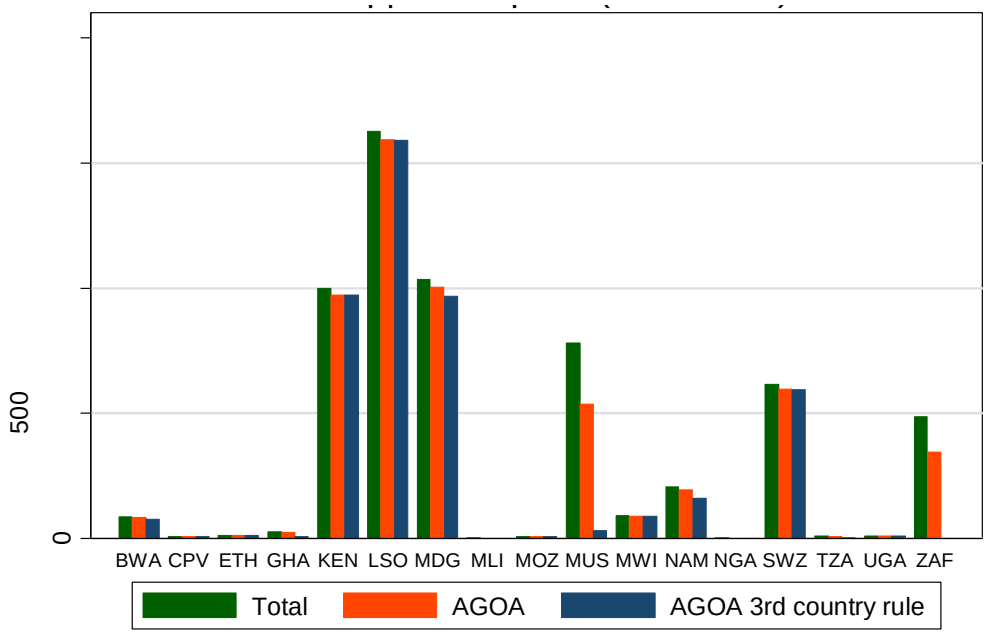
Data and descriptive evidence

The empirical analysis requires data on US imports, Chinese exports, and quota imposed by the US on apparel imports from China. In order to keep compatibility between US and Chinese trade data, we carry out our analysis at the 6 digit level of product aggregation, the most disaggregated level of HS classification that is internationally comparable. The value of US imports (in thousand USD) is taken from the USITC website, which records the tariff regime under which a product enters the US market. Specifically, shipments from AGOA countries could enter the US under the AGOA (i.e. duty- and quota-free), under the General Scheme of Preferences (GSP) for developing countries, or Most-favoured nation (MFN) regime. This information allows us to measure imports that actually entered the US market duty-free when eligible, rather than eligibility only[6]. While we do not have product-level data on whether countries were using the special rule for least-developing countries allowing them to use inputs from any country, we have aggregated data for the years 2003 to 2006 from the AGOA.info website. This data confirms that, conditional on exporting, preference utilisation was high, and that almost all exports of the big apparel exporters, i.e. Kenya, Lesotho, Madagascar, and Swaziland, were

[6] Preference utilization has been an issue for exports of textile products from African countries to the US and the EU, the two major markets that grant preferences to those countries (see De Melo and Pérez-Portugal 2008).

exploiting the 3rd country fabric rule (Figure 2). This implies that the inputs used were neither from AGOA countries nor the US. Consequently, the US-imports variable equals imports that entered under the AGOA scheme for Apparel-eligible countries and the sum of GSP and MFN imports for non-eligible countries.

Figure 2. US apparel imports from AGOA countries (2003-2006)



Data on Chinese exports to AGOA countries are from the UN Comtrade database and are detailed at the HS6 product category.

Textile products subject to quotas in the US are defined by the Office for Textiles and Apparel (OTEXA) of the US government at 3-digit categories. Since our analysis requires the identification of products subject to quotas in a given year and the fill rates (i.e. the ratio between the imported quantity and the allowed quota) at the HS6 digit level, we follow the procedure of Bernhofen et al. (2011) to convert the fill rates from US 10-digit HTS categories to the HS6 digit level. Fill rates from 1996 to 2004 are from Brambilla et al. (2010) and for 2005 and 2006 from Bernhofen et al. (2011).

Finally, information on the AGOA and AGOA-Apparel accession dates by country are taken from the AGOA.gov website, cross-checked with information from AGOA.info and that found on the OTEXA website. Countries became eligible for the Apparel provision in different (daily) dates. Therefore, we

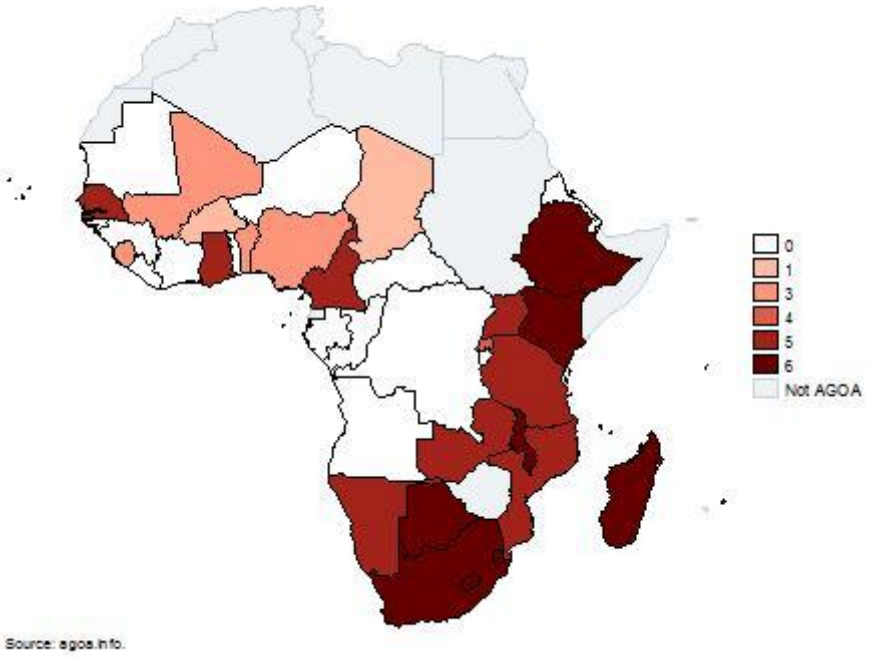
consider a country as being eligible for the Apparel provision in year *t* if it became eligible before 31 July of the same year. Otherwise we record the year of accession as *t+1*. The sample consists of all AGOA-eligible apparel products from 1996 (the first year of the HS96 classification) to 2010 and includes all countries that entered AGOA within this period[7].

Before turning to the econometric evidence, we present some descriptive statistics and trends in the data. Figure 3 maps the origin of US AGOA imports as well as AGOA apparel-eligibility. US imports are concentrated in a few countries, especially those that set up an export-processing zone devoted to textiles (Kenya, Madagascar, Lesotho, and Swaziland).

[7] Three countries, i.e. the Central African Republic, Cote d'Ivoire and Mauritania lost AGOA status during the period, the first two in 2004 and the last one in 2006. None of these countries were eligible for the Apparel provision. Among apparel-eligible countries, only Madagascar lost its AGOA status, in 2010.

Figure 3. AGOA apparel-eligibility and US imports (2000-2006)

Years eligible for the AGOA apparel provision



AGOA apparel exports (log scale)

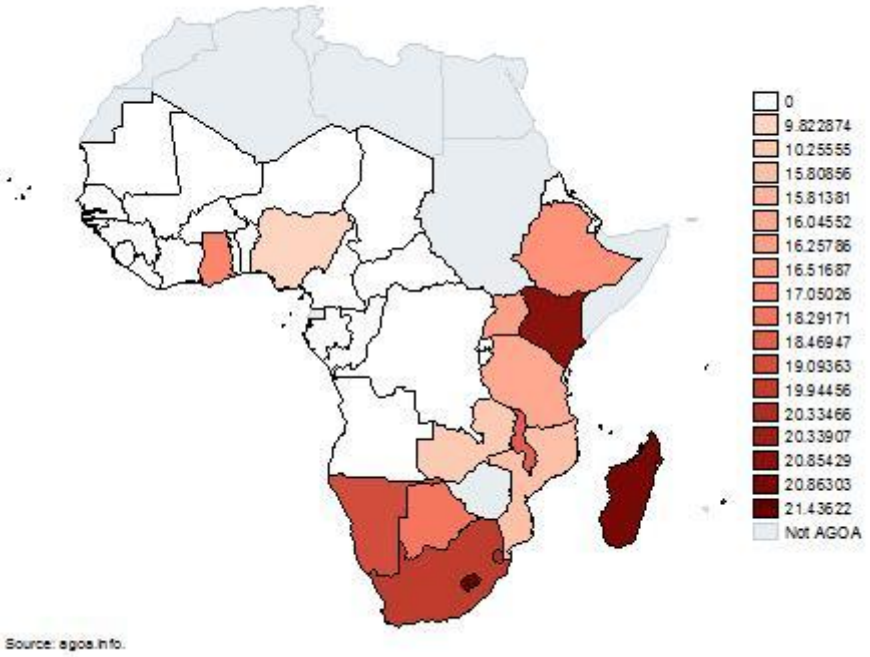


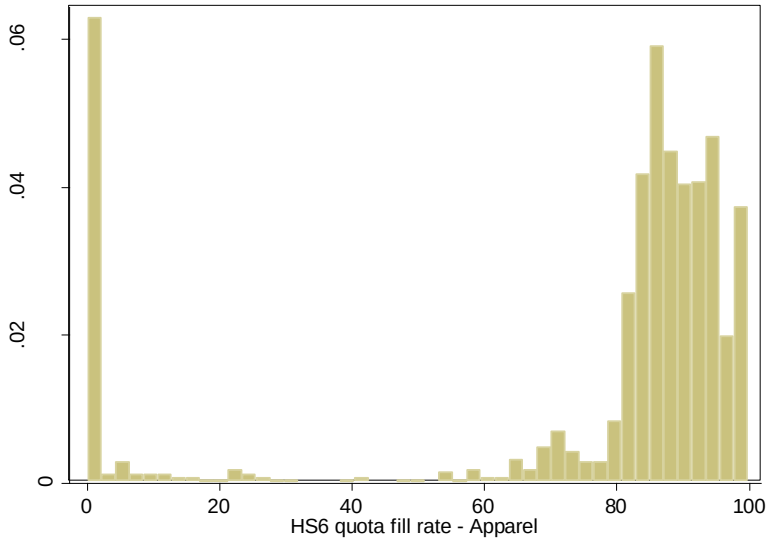
Table 1 provides the number of apparel products that were quota-bound by US by year as well the number of countries eligible for apparel exports. Brambila et al. (2010) suggest a quota fill rate above 90% could be considered as binding. The second leftmost column gives the number of HS6 products that are included in the AGOA-Apparel list and thus is constant over time. The number of countries that became eligible for the AGOA-Apparel provision doubled after the first year of AGOA and then increased steadily until reaching almost 60% of all AGOA members by 2006. The number of products affected by quotas did change especially as a result of China's quota-liberalization process following its WTO accession in 2001 (see Brambilla et al. 2010); yet, this occurred at the more detailed 10-digit level to which the official OTEXA list of products can be converted. Therefore, an HS6 product category is classified as affected by a quota if, within it, at least one 10-digit category is affected by quota. Importantly, the number of products under quota fell dramatically in 2005 as a result of the end of the MFA. Quotas also became less restrictive, so that there were no HS6 products quota-bound by 2006. Still, in May 2005, new temporary quotas were agreed on between the US and due to the surge of Chinese imports in the US.

Table 1. Counts for key variables by year

Year	Products in Apparel List	N. of apparel Countries	N. of quota-bound products
2000	241	0	130
2001	241	9	101
2002	241	18	55
2003	241	19	40
2004	241	23	100
2005	241	23	83
2006	241	25	0

Figure 4 gives the distribution of fill rates from 2000 to 2004. Some apparel products were not exported from China to the US and thus have a zero fill rate. For most exported products, the fill rate was above 80%.

Figure 4. Distribution of US quota fill rates on Chinese apparel products



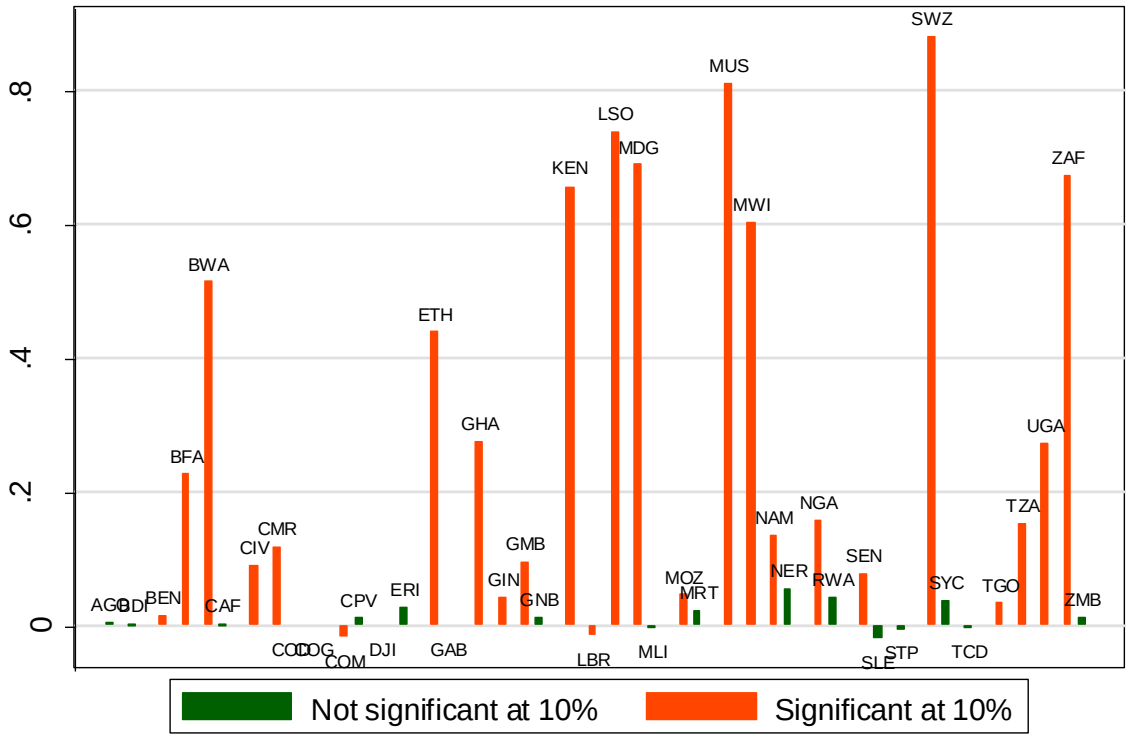
Before turning to our econometric model, we run a simple regression to examine the correlation between imports from China and exports to the US in each AGOA country across apparel categories. We thus run the following regression:

$$USimp_{j,t} = \beta_1(Chinaex_{j,t}) + FE_t + \varepsilon_{j,t} \qquad (2)$$

The term *FE* here captures year fixed effects. We take the natural logarithms of both US imports and Chinese exports so that the coefficients can be interpreted as elasticities[8]. The results, summarised in Figure 5, suggest transhipment is most likely in South Africa, Mauritius, Lesotho, Madagascar, Malawi, Kenya, Swaziland, and Botswana; in other words, exactly the countries identified by Frazer and van Biesebroeck (2010) as the biggest winners from AGOA apparel exports.

[8] Both US imports and Chinese exports have a large number of zeros (about 95% of the sample for both variables). We therefore follow the traditional approach of taking the natural logarithm of the original values augmented by 1.

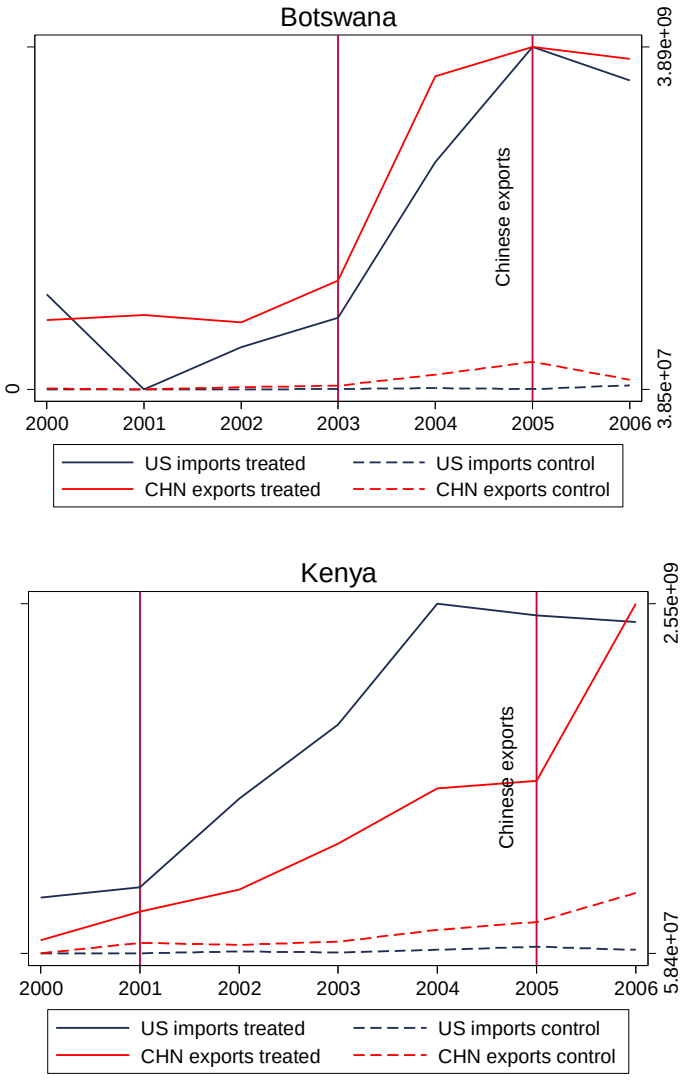
Figure 5. Transhipment elasticities: Correlations between Chinese imports and exports to the US



We then proceed to a close examination of the evolution of Chinese exports and US imports in countries with a high transhipment probability. Here we show the examples of Botswana and Kenya (all countries are available upon request). We separate apparel products into two groups, the treated group, which corresponds to products with binding quotas in the US, and control products, with no binding quotas.

As seen in Figure 6, where the first vertical line indicates the first year the country was allowed to export apparel to the US under AGOA and without rules of origin, Botswana provides the most striking indication of possible transhipment. Imports and exports of treated products move together and surged right after Botswana's apparel-eligibility without ROOs in 2003 and both dropped in 2005, after the end of the MFA. Control products, on the other hand, were always traded at very low levels and never moved together. Kenya provides a similar picture.

Figure 6. Evolution in selected countries

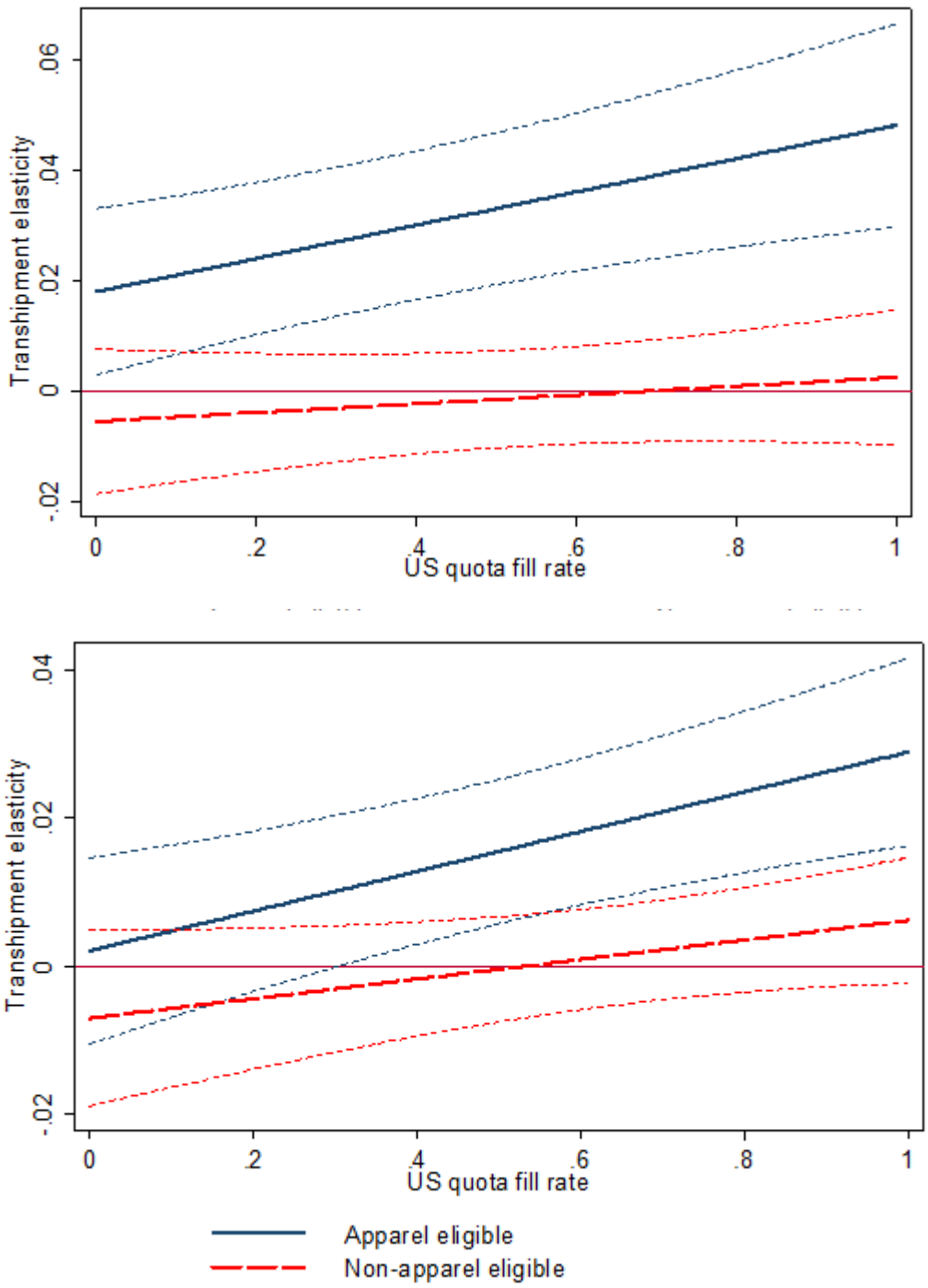


Results and robustness

To verify that the descriptive evidence is supported by our econometric inference, we run regression (1) described above. The results are given in Table 2 and summarizes in Figure 6. As predicted, we find a positive β_T, which we label the transhipment elasticity, both when measuring trade flows in dollars and in quantities (number of items or kg). However, this is only the case in apparel-eligible countries and for products with high fill rates. This indicates that Chinese exports to AGOA were indeed more likely to be transhipped the higher the quota fill rate and provided the transhipping countries enjoyed

duty-free access to the US. This elasticity suggests that a 10% increase in imports from China is associated with a 0.4% increase in exports to the US.

Figure 6. Transhipment elasticity vs. quota fill rate



The short dash lines give the 95% confidence interval.

Table 2. US imports from AGOA countries (1996-2010)

	(1)	(2)
	Values	Quantities
log Chinese exports	-0.006	-0.007
	(0.01)	(0.01)
log Chinese exports x Quota fill rate	0.008	0.014
	(0.01)	(0.01)
log Chinese exports x Apparel eligible	0.024**	0.009
	(0.01)	(0.01)
log Chinese exports x Quota fill rate x Apparel eligible	0.022	0.014
	(0.02)	(0.01)
quota fill rate x Apparel eligible	0.111***	0.118***
	(0.02)	(0.04
Observations	87750	87750
R-squared	0.004	0.001

Country-year and country-product fixed effects. Country-product clustered standard errors.

To show that this positive transhipment elasticity is unique to Chinese exports, we regress US imports on exports from the world's top five apparel exporters as well as an aggregate of the world's exports minus China's. We use a simplified model to ease the significance comparison across countries. The transhipment shown is thus the one estimated at the mean of the fill rate, and only for the period covering 2000-2004 and for apparel eligible countries. Results, in Table 3, confirm that only exports from China predict US imports.

Table 3. Placebos (aka falsification tests)

	US imports from AGOA						
	DEU	FRA	IND	ITA	KOR	RoW	CHN
log exports	0.011	0.008	0.013	0.005	0.023	-0.003	0.016**
	(0.0246)	(0.0134)	(0.016)	(0.014)	(0.0354)	(0.0056)	(0.0068)
N	13639	13639	13639	13639	13639	27372	48750
R2	0.827	0.827	0.827	0.827	0.827	0.791	0.764

Country-product and country-year fixed effects. Period 2000-2004.

As a further robustness check we proceed to examining the country-level determinants of Chinese aggregated apparel exports to AGOA using a gravity framework. More precisely, we estimate the following regression:

$$Chinaex_{j,t} = \beta_1(Eligible_{j,t}) + \beta_2(AGOA_{j,t}) + \beta_3(GDP_{j,t}) + \beta_4(GDPPC_{j,t}) + \beta_5(dist_j) + FE + \varepsilon_{i,j,t} \quad (3)$$

where $AGOA_{j,t}$ equals one if a country is eligible for AGOA in a given year, and the other variables are the usual gravity controls. *FE* here stands for year dummies. We use Poisson pseudo maximum likelihood as under heteroskedasticity, the parameters of log-linearized models estimated by OLS lead to biased estimates of the true elasticities (see Santos and Tenreyro 2006). In this model *Chinaex* is left in levels.

Results in columns (1) and (2) in table 5 suggest that when AGOA countries were apparel-eligible they received about 8 times more Chinese exports compared to non-apparel eligible ones. This result is robust to the inclusion of gravity controls, namely, GDP, GDP per capita, and distance from China. Both GDP and GDP per capita are also associated with higher imports from China, while distance here plays no role. Another strong predictor of Chinese exports is the stock of Chinese migrants living in the African country (Park 2009). This reinforces the Chinese network effect on trade highlighted by Rauch and Trindade (2002). There is no reason why being apparel-eligible should result in higher imports from China apart from providing an export platform to the US. We thus interpret this as further suggestive evidence of transhipment.

Table 5. Chinese apparel export values (2000-2006)

	(1)	(2)	(3)	(4)
Apparel-eligible	2.082***	2.158***	0.668**	0.696**
	(0.406)	(0.425)	(0.284)	(0.271)
AGOA		-0.229	-1.360**	-1.263**
		(0.455)	(0.554)	(0.538)
log_GDPPC			0.408***	0.267**
			(0.138)	(0.131)
log_GDP			1.101***	0.493***
			(0.0714)	(0.138)
log_distance			-0.257	0.968
			(0.749)	(1.015)
log_chinese				0.556***
				(0.0880)
Constant	15.68***	15.68***	-10.05	-11.86
	(0.685)	(0.685)	(6.305)	(8.323)
Observations	308	308	292	230

PPML regressions with year dummies. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Using our benchmark model (equation 1) we can estimate the share of US imports due to transhipment. To do so, we simulate the drop in US imports that would result from a 100% drop in Chinese exports. This gives us a counterfactual corresponding to a world where there would be no Chinese exports to tranship. As per our 3-way interaction model, this drop has heterogeneous effects across products and countries. Our results, which should be interpreted as back-of-the-envelope calculations, are presented in Table 6. We find that transhipment may account for as much as 24% of Botswana's apparel exports and as much as 29% of South Africa's, which is surprising as the latter is not allowed to use inputs from China. Other countries where transhipment accounts for more an important share of exports are Ethiopia, Ghana, Kenya, and Uganda.

Table 6. What share of US imports is Made in China?

Country	Data	If they were no Chinese exports to Africa	Estimated direct transhipment share
ZAF	461917.3	327735.9	29%
BWA	91450.85	69216.81	24%
UGA	13029.46	10484.22	20%
ETH	16420.28	14121.57	14%
KEN	1146325	1002285	13%
GHA	27193.1	23846.6	12%
TZA	10805.02	9570.211	11%
MOZ	9017.042	8080.041	10%
MDG	1171758	1089224	7%
MUS	682525	644622.4	6%
MWI	107933.9	104420.4	3%
NGA	1974.931	1923.063	3%
NAM	197217.3	193547	2%
BEN	1504.581	1478.329	2%
CMR	1729.349	1700.079	2%
SEN	1528.603	1505.436	2%
LSO	2040305	2014436	1%
ZMB	1739.865	1719.315	1%
SWZ	679557.7	672125.1	1%
MLI	1676.913	1664.844	1%

The estimated transhipment share for other countries is 0%.
Period is 2000-2010

To investigate transhipment of apparel products further, we use input-output linkages between apparel (finished) products and their textile inputs. The idea is to check whether AGOA countries imported their production inputs from China.

Since most AGOA countries lack input-output matrices, we use the US one[9]. Each HS6 apparel product, as defined in Table 1, is mapped to a production process using the Bureau of Economic Analysis concordance table. A production process consists in a set of input-output coefficients identifying the value of an input needed to produce one dollar of output. Given the different levels of aggregation, only five different production processes can be identified in our sample of apparel products. The sample spans the 1998-2006 period.

We estimate the value of required textile inputs that would be needed to produce the AGOA exports of each country and year. This value is then compared to the same categories of Chinese exports. We obtain a measure of "missing inputs" by taking the log-difference between the two values[10]:

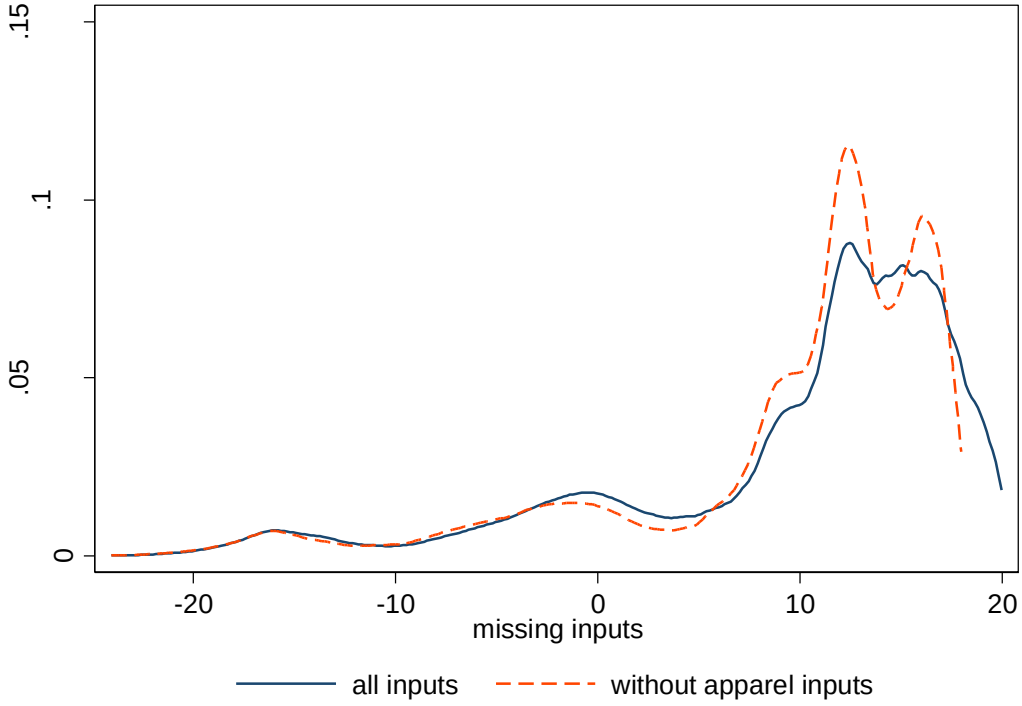
$$Missing\_inputs_{j,i,t}=\ln(1+Required\_inputs_{j,i,t,})-\ln(1+China\_exp_{j,i,t})$$

where *j* indicates the apparel or textile product that is used as an input for the production of at least one apparel output. We estimate an alternative required-input measure which assumes the diagonal of the IO matrix is zero, e.g. no t-shirts are required to make t-shirts. The goal is to focus on inputs that require more assembly work. In Figure 7, we plot the distribution of missing inputs under both scenarios. For both types of input accounting, the distribution of mainly positive values suggests missing required inputs, i.e. Chinese exports fall short of the inputs required to produce their AGOA apparel exports. We find that there are even more missing inputs when we focus only on non-apparel inputs. This suggests that the production process in Africa was indeed more concentrated on the low-value-added final touches.

[9] The 1997 IO Total Requirement table and the corresponding concordance tables are used in the analysis (see http://www.bea.gov/industry/io_benchmark.htm for details).

[10] Summing over required input categories, the number of zeros in both variables is much lower than in the main analysis (30% for required inputs and 45% for Chinese exports).

Figure 7. Missing inputs distribution



If Chinese exports are indeed inputs for AGOA's screwdriver plants, they should mimic the input-requirements predicted by their exports. We thus check whether Chinese exports to apparel-eligible countries can be explained by the inputs predicted by the IO matrix. Results in Table 7 suggest that required inputs do predict Chinese exports, but only across products, not within products across time. We also find that excluding apparel inputs reduces both the size and significance of the cross-product correlation, confirming that the positive correlation captures mostly transhipment with little assembly work.

Table 7. Required AGOA inputs and Chinese exports (1998-2006)

	Chinese exports			
	All inputs		Only textile inputs	
	(1)	(2)	(3)	(4)
Required inputs	0.0982***	0.113	0.0529**	-0.335
	(0.0184)	(0.156)	(0.0216)	(0.233)
Constant	1.970***	1.570	2.609***	7.254**
	(0.245)	(1.938)	(0.282)	(2.884)
Observations	56,444	56,444	49,312	49,312
R-squared	0.264	0.029	0.287	0.028
Country-HS6 FE	nope	yep	nope	yep

Country-year fixed effects. Country-product clustered standard errors. *** p<0.01, ** p<0.05, * p<0.1

To estimate the value added in Africa of the transhipped products, we compare the unit values of Chinese exports to that of US imports. We select only observations where quantities are reported in number of items (in dozens multiplied by 12) for both flows, and only products with binding quotas, so that it is highly likely that the products are aimed for transhipment. We are left with few observations per country but consistent numbers which suggest very little value was added in Africa, between 1 and 2 dollars per item for most countries (Table 8).

Table 8. Difference in unit values (only quota-binding products)

Country	mean	min	max	Std. dev.	share of US import value	Obs.
BWA	1.343153	-9.05158	15.49919	3.448406	21%	48
ETH	1.075958	-2.5718	2.713489	1.146619	42%	35
KEN	1.610395	-4.60207	8.993908	2.285644	36%	94
LSO	1.670203	-0.81999	5.891183	2.057542	38%	12
MDG	2.639539	-2.90232	6.574311	1.718328	66%	91
MOZ	2.053002	0.265296	4.415534	1.205828	58%	9
MUS	4.992096	-17.1369	35.53776	7.123757	61%	49
MWI	2.083966	-0.95516	4.192688	1.397551	44%	26
NAM	1.457407	-2.81318	4.538558	1.70454	44%	17
SWZ	0.885384	-1.0831	2.122966	1.315348	39%	5
TZA	1.525504	-0.26686	4.781505	1.867143	43%	9
ZAF	5.810263	-5.93924	37.80586	7.113461	32%	199
Total	3.29053	-17.1369	37.80586	5.150395	38%	626

Was the transhipment illegal?

Transhipment is legal if a certain level of assembly work is done in Africa. However, if Chinese exporters transhipped final apparel products through AGOA countries to the US, using fake certificates of origin, they are doing something illegal. Illegal transhipment has been an issue in the design of the AGOA Apparel provision. The term illegal transhipment is described on the AGOA website "as claiming a textile or apparel article for preferential treatment that is false with respect to country of origin, manufacture, processing or assembly of the article or any of its parts. If transhipment is found, the US will deny all benefits for future textile or apparel shipments from the transhipping sub-Saharan African exporter for five years." A Memorandum of Understanding between the US and China signed in 2005 highlights that both governments agreed to cooperate on fighting illegal activities concerning trade in textile and apparel products. In a press release (Homeland Security 2006) the US Customs and Border Protection explained that textiles were a priority issue as they represent 43% of all tariff

revenue collected. According to Dayaratna-Banda and Whalley (2007), illegal transhipment of textiles from China to the US is claimed to have amounted to about $2 billion annually. Here we discuss the possibility that the AGOA route we identify was somehow illegal.

According to news and government reports, the transhipment of Chinese apparel via third countries has been taking illegal forms for a very long time. Anecdotal evidence on illegal transhipment of Chinese apparel abound. Already in 1994, the New York Times reported that the US insisted that "China halt clothing transhipments, in which goods move to a third nation, receive new labels and thus escape the US import quota for Chinese- made goods". More recently, a report for the US Congress (Jones 2006) explains how in 2005, the US Customs and Border Protection identified stopping illegal transhipments as a Priority Trade Issue. To combat the practice, it sent "Textile Production Verification Teams" to inspect foreign factories in November 2005 and by 2006 it was said to have seized more than $10 million worth of "misdescribed" textile products. According to a Homeland Security (2006) press release, the Teams reviewed 195 high-risk foreign factories. Of these, 70 were closed, 24 refused the team admission, 50 were considered high potential for transhipments and three had evidence that they were engaging in illegal transhipments. The Jones (2006) report mentions that US producers have accused Chinese manufacturers of illegal transhipment particularly through countries part of the African Growth and Opportunity Act (AGOA) to benefit from preferential treatment on top of circumventing quotas. According to GAO (2004), investigating teams were sent to visit factories in Lesotho, Mauritius, South Africa, Kenya, Madagascar, Swaziland and Botswana in 2002, visiting a quarter of all factories in the latter two countries. It is not mentioned whether the closed factories were in Africa.

While we cannot estimate what share of the transhipment we identify is illegal, the amount of anecdotal evidence is quite suggestive of at least some criminal activity in Africa. But the practice may be hard to eradicate. In 2002, CBP targeted about 2,500 textile shipments out of more than 3 million processed. That is less than 0.01% (GAO 2004).

Conclusion

This paper has shown that the combination of restrictive quotas on Chinese apparel exports in the US and preferential treatment for African exports resulted in transhipment from China to the US via AGOA countries. In terms of policy implications, this paper sheds light on the unintended

consequences of regulation on the organization of international trade. As highlighted by Brambilla et al. (2010), the MFA resulted in a regime which guaranteed smaller developing countries access to the US market. Coupled with AGOA, the incentives of the quotas were strong enough to spur a new, sometimes illegal, trade route, despite the poor infrastructure, high risk, and poor public services associated with African countries, as noted by Frazer and van Biesebroeck (2010). Still, the success of African exports was ephemeral due to the artificially-profitable transhipment.

References

Bernhofen, Daniel, Richard Upward, and Zheng Wang. 2011. "Quota as a Sorting Machine: Quantity Restrictions and Price Adjustments of Chinese Textile Exports to the U.S." *Mimeo. GEP, University of Nottingham*.

Brambilla, Irene, Amit K. Khandelwal, and Peter K. Schott. 2010. "China's Experience Under the Multi-Fiber Arrangement and the Agreement on Textile and Clothing (ATC)." Pp. 345-387 in *China's Growing Role in World Trade*, edited by NBER Chapters. National Bureau of Economic Research, Inc.

Collier, Paul & Anthony J. Venables, 2007. "Rethinking Trade Preferences: How Africa Can Diversify its Exports," The World Economy, Wiley Blackwell, vol. 30(8), pages 1326-1345, 08.

Customs and Border Protection (2012), "Textiles and Apparel Enforcement Statistics", 19 Jan 2012, available online at http://www.cbp.gov/xp/cgov/trade/priority_trade/textiles/textile_apparel_stats.xml

Customs and Border Protection (2011), " Overview of Textiles: A Priority Trade Issue (PTI) ", 3 Jan 2011, available online at http://www.cbp.gov/xp/cgov/trade/priority_trade/textiles/textiles_pti.xml

Dayaratna-Banda, G., and John Whalley. 2007. "After the Multifiber Agreement, the China Containment Agreement." *Asia-Pacific Trade and Investment Review* 3(1).

Edwards, Lawrence & Robert Z. Lawrence, 2010. "AGOA Rules: The Intended and Unintended Consequences of Special Fabric Provisions," NBER Working Papers 16623, National Bureau of Economic Research, Inc.

Fisman, Raymond, J. & Shang-Jin Wei (2004). Tax Rates and Tax Evasion: Evidence from "Missing Imports" in China. Journal of Political Economy, University of Chicago Press, vol. 112(2), pages 471-500, April

Frazer, Garth, and Johannes V. Bieserbroeck. 2010. "Trade Growth under the African Growth and Opportunity Pact." *Review of Economics and Statistics* 92(1):128-144.

GAO (2004) "U.S. Customs and Border Protection Faces Challenges in Addressing Illegal Textile Transshipment", United States General Accounting Office, Report to Congressional Committees, January.

Harrigan, James, and Goeffrey Barrows. 2009. "Testing the Theory of Trade Policy: Evidence from the Abrupt End of the Multifiber Arrangement." *Review of Economics and Statistics* 91(2):282-294.

Javorcik, Beata S. & Gaia Narciso (2008). Differentiated products and evasion of import tariffs. Journal of International Economics, Elsevier, vol. 76(2), pages 208-222, December.

Jones, Vivian. 2006. "Safeguards on Textile and Apparel Imports from China." *CRS Report for Congress*.

Kaplinsky, R. and Morris, M. 2008. "Do the Asian Drivers Undermine Export-oriented Industrialization in SSA?", World Development, 36 (2): 254–273

De Melo, Jaime, and Alberto Pérez-Portugal. 2008. "Rules of Origin, Preferences and Diversification in Apparel: African Exports to the US and to the EU." *CEPR Discussion Papers Series DP 7072*.

Nal and Muchie (undated), "Industrial Upgrading In Sub-Saharan Africa: The Competitive Impact Of China On Supplier Linkage Development Potentials Of Resident Asian Entepreneurs", SLPTMD Working Paper 034

Homeland Security. 2006. "U.S. Customs and Border Protection has Seized $10 Million in Misdescribed Textile Products since October." *Press Release*, February 2.

Mishra, Prachi, Arvind Subramanian & Petia Topalova (2008). Tariffs, Enforcement, and Customs Evasion: Evidence from India. Journal of Public Economics, Elsevier, vol. 92(10-11).

New York Times (1994) "Beijing Is Urged to Stop Transshipment of Goods Through 3d Countries : U.S. Reduces Imports of China Textiles By Up to 35%", 7 January.

Park, Yoon Jung (2009) Chinese Migration in Africa, SAIIA Occasional Paper 24, February.

Rauch, James E. & Vitor Trindade (2002). Ethnic Chinese Networks In International Trade. The Review of Economics and Statistics, MIT Press, vol. 84(1), pages 116-130, February.

Rolfe, Robert J. & Douglas P. Woodward, 2005. "African Apparel Exports, AGOA, and the Trade Preference Illusion," Global Economy Journal, Berkeley Electronic Press, vol. 5(3), pages 6.

Santos Silva J. M. C. & Silvana Tenreyro, 2006. "The Log of Gravity," The Review of Economics and Statistics, MIT Press, vol. 88(4), pages 641-658, 09

Taiwan Economic News (2005) "AGOA Hastens Exodus of Taiwanese Textile Makers to Africa", November 25, http://www.accessmylibrary.com/article-1G1-139122504/agoa-hastens-exodus-taiwanese.html

Traub-Merz, Rudolf. 2006. “The African textile and clothing industry: from import substitution to export orientation.” Pp. 9-35 in *The Future of the Textile and Clothing Industry in Sub-Saharan Africa*, edited by Herbert Jauch and Rudolf Traub-Merz. Bonn, Germany.

de Voest, Joop A (2002) "Extension Of Time For Imports Of Textiles From Outside The AGOA Region", APPENDIX VI, Zambia Trade And Investment Enhancement Project.

Zafar, Ali (2007) "The Growing Relationship Between China and Sub-Saharan Africa: Macroeconomic, Trade, Investment, and Aid Links", World Bank Research Observer.