

Are Trade Preferences a Panacea?

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Abstract

Does “infant industry” preferential access durably boost exports? Using country-product-year data for 1992–2017 and triple-differences regressions, we show that the African Growth and Opportunity Act (AGOA) enhanced apparel exports of African countries on average. But the impact leveled off after the Multi-Fiber Arrangement unleashed competition from Asian countries. Furthermore, the

positive average impact masks regional heterogeneity: East Africa’s late-bloomers offset Southern Africa’s boom-bust pattern. Firm-level data reveal that even East Africa’s export growth was driven by entrants rather than incumbents who received large preference margins during the early AGOA years. Overall, the authors find little evidence that preferences durably boosted exports.

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Are Trade Preferences a Panacea?

The Export Impact of the African Growth and Opportunity Act*

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1. Introduction

Economists do not agree on whether preferential access to foreign markets can help developing countries, particularly in Africa. Some see it as a means “to transport a bit of the economic miracle from China to Africa.”¹ Unlike conventional infant industry protection, the benefits of preferential access are conditional on competing successfully in foreign (rather than domestic) markets. Moreover, prolonged privileged access cannot be taken for granted, creating stronger incentives to improve performance. Others are skeptical about the benefits of trade preferences, because they can dilute the case for policy reform at home and lure beneficiaries into sectors where they do not have a comparative advantage (Özden and Reinhardt, 2005; Hoekman and Özden, 2005). In support of the former view is evidence that privileged access to the United States (US) market under the African Growth and Opportunity Act (AGOA) spurred in its early phase growth in African exports (e.g., Frazer and Van Biesebroeck, 2010). The latter view finds support in the limited benefits reaped by African countries from the Generalized System of Preferences (GSP) (e.g. Herz and Wagner, 2011).

There is surprisingly little evidence, however, on the important and interesting economic question: did preferential access *durably* boost African export performance? The true measure of success for infant industry assistance is not whether performance improves while the assistance is in place but whether the improvement survives a reduction in assistance. Most analytical trade models would predict static benefits of preferential market access in terms of contemporaneous export increases. But dynamic benefits of privileged market access (or production assistance), in terms of enhanced *future* competitiveness, arise under more demanding conditions. Either we need dynamic economies of scale internal to the firm, e.g. due to learning-by-doing, which the firm

¹ See interview available at <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1752-5209.2008.00017.x> and Collier (2007).

cannot exploit without external assistance because of market failures, e.g. imperfect capital markets. Or we need dynamic externalities between firms within an industry, e.g. due to demonstration effects, which no individual firm would generate without external assistance.

We evaluate the longer-term effects of preferential market access exploiting trade policy changes in the US at the turn of the 20th century: the expansion of GSP products to for less developed countries in 1997 (henceforth, “GSP LDC”) and the implementation of AGOA in 2001. To place the policy changes in context, note that well before the entry into force of AGOA in 2001, close to a third of tariff lines in the US already had zero most favored nation (MFN) tariffs and another third were duty-free for least developed countries (LDCs) under the 1970s GSP regime. The expansion of GSP products for LDCs in 1997 freed another 24 percent of dutiable US tariff lines from duties. The coming of AGOA was unprecedented because the US allowed duty-free entry of apparel products for the first time for all African countries eligible for apparel benefits, accounting for a further 8 percent of dutiable tariff lines.² And for African non-LDCs, AGOA freed another 23 percent of dutiable tariff lines on non-apparel products (that had already become duty-free for African LDCs in 1997).

Eligible African apparel beneficiaries obtained privileged access to the US market, not only because other countries continued paying tariffs but also because the main exporters were initially subject to quotas under the Multi-Fiber Arrangement (MFA).³ These quotas were entirely phased out by 2005, unleashing competition from China and other Asian countries and eroding the preferences that African countries enjoyed in the US market. The GSP LDC in 1997 and the AGOA implementation in 2001 allow us to assess whether preferential access leads to an

² Section 4 describes the requirements for African countries to be eligible for apparel benefits.

³ The MFA governed world trade in textiles and apparel from 1974 through 2004, with quotas imposed on the totals that certain developing countries could export to developed countries. See Brambilla et al. (2010) for details on the MFA.

expansion of exports for beneficiary countries, for products in general and for apparel specifically. The MFA end allows us to assess whether any expansion in apparel exports persisted beyond the reduction in trade preferences.

The paper utilizes a highly disaggregated trade and tariff database spanning 26 years, which we constructed by combining US import data from the US Census Bureau with US tariff data published by the US International Trade Commission (USITC) at the HS 8-digit tariff line level, aggregated to the 6-digit level for the econometric estimation. The sample includes product-level data for 208 exporting countries over the period 1992-2017, with a total of 27 million observations.

To identify the causal impact on African countries' exports, we take a treatment and control group approach. This approach relies on several variants of the triple-differences specification with a highly stringent set of fixed effects following Frazer and Van Biesebroeck (2010). The estimators identify the impact of GSP LDC and of AGOA based on the growth in exports to the US for eligible countries of eligible products, relative to the growth in exports to the US for the control group, which includes non-eligible products in eligible countries; non-eligible products in control countries; and eligible products in control countries. The specification controls for country-product fixed effects, so impacts are identified relative to average pre-AGOA exports to the US of that country-product; country-year fixed effects, so impacts are net of (supply) shocks to overall exports to the US from a country and net of macroeconomic shocks (such as the Great Recession); and product-year fixed effects, so impacts are net of shocks to overall US imports of a product (due to changes in US preferences or global technological/supply shocks). A concern with the triple-differences research design is differential pre-treatment dynamics. Estimates of the GSP LDC and AGOA impacts could be spurious if there were differences in the dynamics of exports to the US of eligible countries and products before the enactment of these trade preference

programs. To address this concern and innovating relative to previous literature, our specification includes treatment group-specific time trends.

Our main findings are as follows. First, considering the average impact over the entire period following the US trade policy changes, we find that the US GSP LDC expansion had a positive and significant impact on African exports of eligible products. The largest boost from AGOA was to exports of apparel products, which benefitted from the largest tariff preferences. While there is evidence of apparel export diversion from other destinations (European Union (EU) and the rest of the world), aggregate apparel exports of beneficiary countries also increased. Thus, AGOA's trade creation aspect outweighs trade diversion aspects. The export diversion suggests that export growth to the US was not driven solely by supply-side improvements in African countries. Using a specification that pools across country-product exports to different destinations we show that AGOA boosted exports to the US even after controlling for the impact of product-specific domestic developments such as policy reforms through country-product-year fixed effects.

Second, we assess the durability of the AGOA impacts by estimating a separate impact of AGOA for each year from 2001 onwards. We show that the marginal impacts on apparel exports of beneficiary countries exploded in the first years post-AGOA but then leveled off after the MFA ended in 2005. This flattening could be a consequence of the erosion of preferences for African countries facing fiercer competition from Asian giants in the US market.

Third, we find that the sustained (or at least non-declining) impact of AGOA on apparel exports is due to East Africa's success, which in some cases came late. While Central and Western Africa saw little export growth due to AGOA, the significant boom in Southern Africa's exports in the first AGOA years was followed by a bust after the MFA ended. After 2005, aggregate African exports were sustained only by the large marginal impacts of AGOA on East African exports.

Fourth, an examination of the firm-level dynamics in Eastern Africa does not support the view that preferential access led to durable benefits. For this analysis, we draw upon customs transaction-level data for four representative African countries. The sustained dynamism of Kenya and the late growth of Ethiopia in their exports of apparel to the US were driven largely by new exporters that entered the market after 2010, rather than by incumbent exporters that had benefitted from large preference margins during the early AGOA period. This pattern rules out dynamic benefits internal to the firms but we cannot rule out dynamic externalities across firms within the apparel industry. In Madagascar and Mauritius, a large-scale exit of firms accompanied the contraction of exports after the end of the MFA and the withdrawal of AGOA benefits to Madagascar in 2009. Exports recovered only after Mauritius was granted liberal rules of origin (ROO) in 2009, and hence a wider preference margin, and Madagascar regained AGOA preferences in 2015. This pattern suggests that the ups and downs in firms' export performance were driven by fluctuations in the preference margin rather than by dynamic benefits internal to the firm. Furthermore, growth was concentrated in surviving firms with almost no role played by new firms which does not support the existence of dynamic externalities. Thus, in none of the four countries is there evidence of firms learning-by-doing and becoming internationally competitive due to the preferential access they enjoyed in the early AGOA period.

Finally, we explored the reasons for the heterogenous responses to AGOA. While a thorough analysis was not possible, two reasons may explain why the impact of AGOA differed across African countries. Low tariffs on own imports may help explain the initial success of Southern African countries, because such regimes allowed easy access to imported inputs even compared to that in other countries where duty-drawback and other schemes involved higher transactions costs. The establishment of effective special economic zones (SEZs), which combined liberal trade

regimes with ease of doing business and improved infrastructure, may be a reason for the success of Mauritius, Kenya, and Ethiopia.

The remainder of the paper proceeds as follows. Section 2 describes the related literature, Section 3 the data, and Section 4 the trade preference regimes. Section 5 presents the econometric specification while Section 6 presents the main results. Section 7 examines the possibilities of trade diversion and domestic sectoral developments. Section 8 presents firm-level evidence while Section 9 focuses on heterogeneity. Section 10 concludes.

2. Related literature and our contribution

We begin by presenting the analytical basis for expecting trade preferences to have dynamic benefits within firms, industries, or countries. We then describe how our paper contributes to the existing empirical literature. Standard trade models, such as Krugman (1979), predict static gains in the form of increased exports from a reduction in tariffs under trade preferences. But dynamic “infant industry” benefits from preferential foreign market access require long-term comparative advantage to emerge.⁴ Trade preferences can enable firms to take advantage of economies of scale in a static sense but also dynamically to learn by doing (LBD), i.e., to go down the cost curve as greater experience with the production process is gained (Dasgupta and Stiglitz, 1988; Mayer, 1984). As such, LBD may create durable changes in comparative advantage (Krugman, 1987). Firm-level LBD may also include the discovery of the most efficient imported inputs and supply chains (Halpern et al. 2015, Oberfield, 2018). These firm-level profitable opportunities may not have been realized before trade preferences were introduced due to market failures in the form of financial market imperfections or information constraints.

⁴ A concern of US policymakers has been the possibility that trade preferences could lure countries to sectors where they do not have or could not have a comparative advantage (US Congressional Research Service, 2013).

Apart from beneficial changes within firms, persistent changes in comparative advantage could also be due to external economies such as Marshallian externalities across firms within industries leading to a movement across different equilibria for an economy (Chipman, 1970; Ethier, 1982; Grossman and Rossi-Hansberg, 2010; Lyn and Rodriguez-Clare, 2013). For example, LBD benefits may spill over within an industry or country through the movement of experienced workers across firms (Stoyanov and Zubanov, 2012). External economies can also manifest themselves through demonstration effects as firms learn about export capabilities from previous exporters (Hausman and Rodrik, 2003), or the establishment of country reputation in new foreign markets by previous exporters (Rauch and Casella, 2003; Krautheim, 2012). These industry- and country-level profitable opportunities may also not have been realized prior to the trade preferences due to market failures due to financial, information, or coordination constraints.

Generous trade preferences may also have a dynamic effect by relaxing internal constraints within countries relating to underdeveloped markets, coordination failures across industries, and poor policies. For example, strong profit opportunities in export markets fostered by those preferences may attract foreign direct investment that would compensate for underdeveloped domestic capital markets. Even temporary strong export growth could help resolve coordination problems created by pecuniary external economies in professional or transportation services sectors (Murphy et al., 1989; Acemoglu and Zilibotti, 1994). Finally, demonstration effects from export successes in the region could encourage countries to engage in necessary domestic reforms.⁵

Our paper's main contributions are to the empirical literature on the impact of nonreciprocal trade preferences on developing countries' trade flows.⁶ Herz and Wagner (2011), Gil-Pareja et al. (2014), and Ornelas and Ritel (2020) estimate the impact of nonreciprocal trade

⁵ Hanson et al. (2018) empirically demonstrate the importance of thinking about comparative advantage in such dynamic terms.

⁶ See USITC (2014), Cirera and Cooke (2015), and Ornelas (2016) for reviews of the literature.

preferences using a gravity equation and a country-year indicator for whether preferences are in effect.⁷ Our paper follows a more rigorous identification strategy to obtain a causal impact, combining a triple-differences specification, highly disaggregated country-product-year trade data, and treatment indicators identifying countries and products benefitting from GSP LDC and AGOA in each year.⁸ Accounting for product heterogeneity in eligibility and hence for the extent of tariff cuts and preference margins is crucial to attribute positive trade outcomes to the preferences.

Using country-product-year data from 1998 to 2006, Frazer and Van Biesebroeck (2010) show that AGOA significantly increased African countries' non-oil exports to the US and the impact grew over time from 2001 until 2006. We make four key innovations in our study relative to theirs. First, and most important, by considering the period until 2017 we examine the durability of the impact of trade preferences and test whether benefits survive the erosion of preferences due to the end of the MFA.⁹ Second, by considering a period starting in 1992 we estimate separately the impact of GSP LDC from that of AGOA, whereas they attribute to AGOA an impact on non-apparel products for LDCs from 2001 onwards which was in fact an impact of GSP LDC from 1998 onwards. Third, and also crucial, our specification controls for treated-group specific time trends to account for the possibility that pre-treatment trends differ for treated and untreated product-country cells, which helps to ensure that causal impacts of AGOA and GSP LDC policy

⁷ The three studies use state-of-the-art gravity equation estimation which accounts for multilateral resistance terms, time-invariant and time-variant unobserved bilateral heterogeneity, and zero trade flows. Kassa and Coulibaly (2018) apply quasi-experimental synthetic control methods to bilateral gravity estimation of the impact of AGOA.

⁸ Our study's nuanced view of the impact of trade preferences complements some gravity equation studies' findings. Herz and Wagner (2011) obtain a negative long-run impact on exports of GSP beneficiary countries that they argue may be due to distortions induced by the GSP on the countries' economic structure related to administrative costs to comply with GSP ROO. But their "long run" involves estimating their gravity equation using only data every 5 or 10 years (instead of yearly data as in their "short run"), they do not consider a post-preference scenario as we do. They conclude GSP-type trade preferences are not an adequate tool to promote economic development. Ornelas and Ritel (2020) show an ambiguous impact of nonreciprocal trade preference programs on average and a strong positive impact on exports of LDCs that are World Trade Organization (WTO) members. The rationale is that for LDCs trade preferences complement the economic reforms required by WTO membership.

⁹ A recent study by Hakobyan (2020) using country-product-year data and a triple difference-in-differences specification shows that developing countries' exports to the US decline in 2011-2012 following a temporary expiration of US GSP in 2011 (although duties collected during the expiration period were ultimately refunded).

changes are estimated. Fourth, by assembling detailed tariff data varying by country-product-year for the period 1997-2017, we consider the trade policy shocks not only in terms of country-product eligibility for duty-free treatment but also in terms of the magnitude and dynamics of the preference margin offered to beneficiary and non-beneficiary countries.

Our study also complements the handful of studies that assessed the impact of the special provisions in AGOA for textile and apparel articles, but, in contrast to our study, they focused only on early impacts, up to 2008 at most. Two studies anticipate some of the concerns we raise.¹⁰ Edwards and Lawrence (2010) assess whether AGOA's apparel provisions led to a sustained effect using a theoretical model. They find that MFA quotas on China helped AGOA countries, Lesotho in particular, to increase exports of low value-added apparel products to the US. But this increase was not associated with sustained benefits since the ROO - which allow countries to import fabric from any origin - did not encourage significant local value-addition.¹¹ Rotunno et al. (2013) also emphasize the role of simplified ROO (single transformation) under AGOA in fostering rapid growth of African LDCs' apparel exports to the US in the first preference years. Importantly, they show this rapid growth did not represent true export success but instead reflected those countries' imports of apparel from China being transshipped duty-free to the US without any value addition, a pattern which stopped after the MFA ended.¹²

The restrictiveness of ROO may affect not only the immediate impact of trade preferences but also for its sustainability when preferences decline. Our firm-level analysis for Mauritius in Section 6 will demonstrate that the ROO liberalization led to a significant increase in its apparel exports to the US. In the long-run, restrictive ROO may limit preference utilization but, by

¹⁰ Mattoo et al. (2003) also anticipated difficulties for African countries' apparel exports under AGOA after the MFA end.

¹¹ AGOA's simplified ROO for apparel will be described in Section 4.

¹² The role of ROO for apparel exports under preferential access is studied by Collier and Venables (2007) and De Melo and Portugal-Perez (2013) who show AGOA with its simplified ROO had a significant positive effect on African apparel exports to the US before 2005 in contrast to weaker effects of Europe's Everything But Arms with its more stringent ROO on exports to the EU.

inducing greater local value added, lead to greater LBD and more durable effects on production and exports.¹³ Unfortunately, it is difficult to test this more interesting conjecture in the AGOA context since almost all African countries were allowed access under identical liberal ROO.

3. Data

The analysis in this paper is based on a new highly detailed database that we constructed by combining US trade data from the US Census Bureau with tariff data published by the US International Trade Commission. The US database provides detailed information on tariffs and product-eligibility for trade preferences in the US each year, including the applied MFN tariff the country-product faces in the US, the unilateral preferences the country-product can benefit from in the US (e.g., GSP, AGOA), and the best preferential tariffs the country-product can benefit from in the US in the period 1997-2017.¹⁴ Tariff measures are all expressed as ad-valorem.¹⁵ The US database also includes value and quantity of US imports at country-HS 8-digit product-year level.

The US database offers important advantages relative to the widely-used trade and tariff data from the World Trade Integration Solution (WITS). First, it provides information at a more disaggregated 8-digit level. Second, it provides much better coverage in terms of years for all types of tariffs, MFN or preferential (under a large number of programs and regimes), whereas WITS has many tariffs missing. Imputation techniques used in the literature to correct those missing tariffs may yield inaccurate tariff rates. Third, preferential tariff rates are constructed based on

¹³ Cherkashin et al. (2015) show that EU's EBA preferences that enabled firms in Bangladesh to start exporting apparel to the EU also allowed them to export to other markets as firms overcame fixed costs of production and exporting. The strict ROO requirements of EU's EBA and its potential encouragement of greater local value added may have helped explain those benefits.

¹⁴ The US database is a companion to a comparable EU database that we mention later in this section. More details and the databases are available at: <https://datacatalog.worldbank.org/node/144174/revisions/365082/view>.

¹⁵ We compute ad-valorem equivalents for duty variables expressed as specific tariffs or combined tariffs (with an ad-valorem and a specific component) by dividing the specific tariff (or specific component) by the import unit price, itself computed as the median across the unit values of all US imports of a given HS 8-digit product in a given year across partner countries.

updated preferential trade agreements, whereas they are often not updated in WITS in cases of phasing in and out. Fourth, it includes information on actual imports entering under different trade regimes (e.g., GSP and AGOA) so preference utilization rates can be computed. The detailed tariff information allows us to examine how the trade effects of AGOA or GSP LDC preferences vary with the magnitude of the preference margin offered to beneficiary countries and in response to the reciprocal and non-reciprocal preferential tariff rates granted by the US to other countries.

For the econometric analysis, we make the following adjustments to the US database. First, in order to capture trade flows before the GSP LDC expansion in 1997, we augment the import data to include years from 1992 onwards. Second, for computational feasibility, trade and tariff data are aggregated from the 8 to the 6-digit level for the econometric estimation. Third, in order to account for zero trade flows, we expand the database such that it is a balanced panel where all countries exporting to the US have observations for all products in all years. Fourth, we exclude from the estimating sample oil products (HS chapter 27), though they account for a large share of AGOA-eligible exports from African countries to the US, to focus on the impact on other products. To account for several HS revisions between 1992 and 2017, we convert all codes into HS 1996 revision 6-digit codes using concordance tables provided by WITS.

The sample used for the econometric analysis includes 27,420,560 observations, 87 percent of which have zero imports. AGOA-eligible countries - described in Section 4 - export to the US substantially fewer HS 6-digit products and smaller values than control countries, whether the products are AGOA-eligible or not. On average, AGOA-eligible countries have positive exports to the US in only 97 products whereas for control countries that number is 734.¹⁶

¹⁶ The summary statistics on the estimating sample are provided in Online Appendix B.

Two additional sources of data are used. The tariff information does not capture the ad-valorem equivalents of quotas such as those on apparel exports under the MFA. We use information on whether an exporting country and MFA category defined by OTEXA faced a quota in the US market in 1992-2004 from Brambilla et al. (2010).¹⁷ To analyze potential trade diversion effects from GSP LDC and AGOA, we use a new EU database that we constructed along similar lines as the US database, relying on Eurostat's COMEXT trade flow data and on European Commission's TARIC tariff data and WITS data for other countries' imports.

4. Trade preferences in the US: GSP and AGOA

The US has provided developing countries with preferential access to its markets through the GSP program since 1975.¹⁸ Until 1997, for eligible LDCs, 3,507 out of 10,184 tariff lines (at HS 8-digit level) faced a preferential zero rate of duty, and another 3,131 faced an MFN zero rate of duty (see Panel A of Table 1). In 1997, the US GSP expanded the benefits for LDCs by allowing duty-free entry for an additional 1,670 tariff lines.¹⁹

For Sub-Saharan African (SSA) countries the US GSP program was supplemented by the AGOA non-reciprocal preferential trade agreement that entered into force in 2001. The number of SSA countries eligible for AGOA increased from 34 in 2001 to 49 in 2017.²⁰ Firstly, AGOA extended US GSP duty-free treatment for non-apparel products. It granted to non-LDCs duty-free access for 1,610 tariffs lines that were duty-free for LDCs under GSP LDC (see Panel A of Table

¹⁷ The quota information is available at http://faculty.som.yale.edu/peterschott/sub_international.htm. The 3-digit MFA categories defined by OTEXA are mapped to 10-digit US HS codes using a concordance.

¹⁸ The Sub-Saharan African countries eligible for US GSP and for US GSP LDC in 1995-2017 are listed in Online Appendix A. To be eligible for US GSP, countries must *not* be classified as "high income" by the World Bank. Eligibility for GSP LDC is determined by the United Nations based on three criteria: per capita gross national income, human assets, and economic vulnerability to external shocks (see <http://unohrrls.org/about-lDCs/criteria-for-lDCs/>).

¹⁹ US GSP expired in January 2011 until its renewal by the US Congress in November 2011 retroactively (Hakobyan, 2020).

²⁰ This very brief description of AGOA rules draws heavily on Chapter 1 in USITC (2014). The SSA countries eligible for AGOA and textiles and apparel provisions in 2001-2017 are listed in Online Appendix A. Some countries lost eligibility during the period (with some later regaining it) due to political violence, rule of law problems, and human rights abuses.

1). It also granted to LDCs duty-free access for an additional 225 non-apparel tariff lines.²¹ Secondly, AGOA granted duty-free treatment for textile and apparel articles (excluded from duty-free treatment under GSP) through two provisions: the general AGOA textile and apparel provision and the AGOA ‘special rule’ for LDCs. As of 2017 the number of countries qualifying for each provision were 26 and 25 respectively.²² The ‘special rule’ modified the ROO by allowing duty-free access to apparel articles using yarn, thread or fabric sourced from any country in the world, the so-called ‘third-country fabric provision’.²³ Under either provision, 555 apparel tariff lines became duty-free in the US from 2001 onwards (see Panel A of Table 1). These tariff lines had never been duty-free under any other non-reciprocal trade preference regime. Post-AGOA, 1,096 [1,156] tariff lines remain dutiable in the US for LDCs [*non-LDCs*].²⁴ Figure 1 plots the distribution of MFN tariffs for GSP LDC-eligible and AGOA-eligible apparel and non-apparel products prior to the trade preferences being implemented. The averages corresponding to those distributions are 13 percent for GSP LDC products, 12 percent for AGOA apparel products and 5 percent for AGOA non-apparel products. The figure illustrates how the AGOA tariff liberalization was substantially more important for apparel than for non-apparel products.

²¹ ROO for these non-apparel products are similar for all AGOA-eligible countries and resemble those of the GSP program. Duty-free treatment by the US is allowed if the product is the “growth, product, or manufacturing” of an AGOA beneficiary country and if the percentage of local content in the appraised import value of the good when it enters the US exceeds 35 percent, which can include the cost of materials and parts sourced from other AGOA-eligible countries and the cost of materials and parts sourced from the US (that can account for up to 15 percentage points of that 35 percent).

²² To be eligible for preferences under the general AGOA textile and apparel provisions, countries need to be certified to have in place an effective visa system, enforcement and verification procedures, which ensure the goods on which AGOA benefits are claimed are produced in an eligible SSA country, meeting the required ROO. To be eligible for the AGOA ‘special rule’, countries need to have a per capita gross national product (GNP) below \$1,500 in 1998, thus being designated as lesser developed beneficiary countries (LDBC). Although Botswana, Namibia, and Mauritius are not LDBCs by their per capita GNP, amendments to AGOA designated them as LDBCs from 2004 onwards but for Mauritius treatment as LDBC was not renewed in 2006 though it was granted again in 2008 indefinitely.

²³ South Africa is the only SSA country eligible for the general textile and apparel provisions but not for the AGOA ‘special rule’. So its ROO for apparel and textile articles require either the use of US yarn, thread or fabric (bilateral cumulation) for duty-free quota-free access, or the use of AGOA-originated yarn, thread or fabric for duty-free access but with quantitative restrictions.

²⁴ The difference across the two country groups is explained by 60 of the 1,670 tariff lines that became duty-free under the 1997 GSP LDC but were not extended to SSA non-LDCs under AGOA. Of the 1,096 tariff lines that remain dutiable for LDCs, textiles (HS 50-60) and textile-products other than apparel account for the bulk, while food products and travel goods make up the rest.

But MFN tariff rates are an imperfect benchmark for the preferential treatment provided by AGOA in the US, given the proliferation of preferential trade agreements between the US and non-African countries. A better benchmark is the preferential tariff rates granted by the US trade agreements with other countries captured by competition-adjusted relative preference margin (RPM) as in Nicita (2011). The RPM captures the difference between the trade-weighted average tariffs paid by competitor countries, with a higher RPM indicating a higher preference in the US (see Online Appendix B). AGOA resulted in an RPM in apparel for the African countries that is as large as that given by the North American Free Trade Agreement to Mexico and is robust to the Central American Free Trade Agreement preferences given to El Salvador from 2005 onwards.

SSA manufacturing exports to the US grew steadily from 1997 to 2007, fell due to the Great Recession and stabilized afterwards while SSA apparel exports to the US grew rapidly after 1997, accelerated after 2000, but declined steadily after 2005, then picking up again and stabilizing after 2010 (see Online Appendix Figure B3).²⁵ These aggregate patterns are not typical for all SSA countries. We cluster heterogeneous patterns of countries exports post-AGOA into four groups (see Online Appendix Figure B4). First, a ‘missed opportunities’ group, typified by Cameroon, includes countries with limited exports to the US which did not take significant advantage of AGOA at any stage.²⁶ Second, a ‘boom-bust’ group, typified by Eswatini, includes countries experiencing a large boom in apparel exports to the US immediately after AGOA starts, followed by a dramatic bust after the MFA ends in 2005, and settling at low levels subsequently. Third, a ‘growth and stagnation’ group, typified by Lesotho, includes countries with substantial growth in apparel exports in the initial years of AGOA, a small decline when the MFA ended, and stagnant exports

²⁵ Restrictive ROO or administrative burdens are potentially an obstacle for SSA exports to qualify for duty-free treatment in the US under AGOA. But we find that AGOA utilization rates, i.e., the share of preference-eligible imports that enter the US using AGOA, rapidly reached 90 percent (see Online Appendix B).

²⁶ In the Online Appendix B figures, the notes list the other countries in each of the four groups.

afterwards. Finally, a ‘late and sustained success’ group typified by Kenya includes countries experiencing varying growth in apparel exports to the US immediately after AGOA but subsequently showing steady growth, that accelerated after 2010.

5. Econometric specification

How far are the patterns discussed in Section 4 attributable to trade preferences and, for apparel, to the erosion of preferences when MFA quotas were phased out? To identify a causal impact of AGOA and GSP LDC on African countries’ exports to the US over the long 1992-2017 period, we take a treatment and control group approach that relies on a variant of the triple-differences specification with a stringent set of fixed effects proposed by Frazer and Van Biesebroeck (2010):

$$\begin{aligned}
\ln(Imp_{cpt}) = & \sum_{r \in (s, ns)} \beta_{1r} \times GSP_p \times GSP_c \times PostGSP_{ct} \times 1\{c \in r\} \\
& + \sum_{j \in (n, e)} \beta_{2j} ANonApp_p \times ANonApp_c \times PostANonApp_{ct} \times 1\{c \in j\} \\
& + \beta_3 AApp_p \times AApp_c \times PostAApp_{ct} \\
& + \left[\sum_{r \in (s, ns)} \gamma_{1r} \times GSP_p \times GSP_c \times \tau \times 1\{c \in r\} \right. \\
& \left. + \sum_{j \in (n, e)} \gamma_{2j} ANonApp_p \times ANonApp_c \times \tau \times 1\{c \in j\} + \gamma_3 AApp_p \times AApp_c \times \tau \right] + \delta_{cp} + \delta_{ct} \\
& + \delta_{pt} + \epsilon_{cpt}
\end{aligned} \tag{1}$$

where Imp are US imports, c is an exporting country, p is an HS 6-digit product, t is a year, τ is a time trend taking value 1 in 1992, 2 in 1993, ..., up to 26 in 2017, and ϵ is an independently and identically distributed (i.i.d.) error term. Separate impacts for five categories of treated countries and products are estimated. The first two interaction terms capture the GSP LDC policy change.

The terms are the product between an indicator for countries eligible for GSP LDC (GSP_c), an indicator for the 810 products that are eligible for duty-free treatment under GSP LDC (GSP_p), and an indicator for years 1998 onwards ($PostGSP_{ct}$) which varies with country eligibility for GSP LDC.²⁷ To capture the impact on African countries, the first interaction term covers African LDCs (c equals s) while the second interaction term covers non-African LDCs (c equals ns).

The third and fourth interaction terms capture the AGOA policy change on non-apparel products. The terms are the product between an indicator for AGOA-eligible countries ($ANonApp_c$), an indicator for non-apparel products that become eligible for duty-free treatment under AGOA ($ANonApp_p$), and a country-varying indicator for the post-AGO period from 2001 onwards ($PostANonApp_{ct}$). The third term captures products that become eligible for duty-free treatment under AGOA for African LDCs and non-LDCs (91 AGOA-only products, j equals n) while the fourth term captures products that become eligible for duty-free treatment for African non-LDCs (769 AGOA non-LDC products, j equals e).²⁸

The fifth interaction term is the product between an indicator for countries eligible for the AGOA apparel provision (henceforth designated as AGOA apparel-eligible countries) ($AApp_c$), an indicator for the 239 apparel products eligible for duty-free treatment under AGOA ($AApp_p$) and a country-varying indicator for the post-AGO period from 2001 onwards ($PostAApp_{ct}$).

The coefficients in Eq. (1) are estimated based on *within* country-product variation over time given the country-product fixed effects δ_{cp} . The country-year fixed effects δ_{ct} and product-year fixed effects δ_{pt} account flexibly for global demand and supply and other economy-wide

²⁷ The numbers of HS 6-digit products covered by each treatment variable listed in this and following paragraphs are shown in Online Appendix B. Although the presence of $PostGSP_{ct}$ makes the presence of GSP_c unnecessary (and similarly the presence of $PostANonApp_{ct}$ makes $ANonApp_c$ unnecessary and that of $PostAApp_{ct}$ makes $AApp_c$ unnecessary) we follow Frazer and Van Biesebroeck (2010) in including those variables to make the triple-differences specification explicit in Eq. (1).

²⁸ These 769 products were already eligible for duty-free entry for African LDCs under US GSP LDC before AGOA was enacted.

shocks in the exporting countries, including those related to the Great Recession, and for changes in US preferences or global technological/supply shocks for particular products.²⁹

Despite the very stringent set of fixed effects, the coefficients in Eq. (1) can be given a causal interpretation only if we assume that the timing of the 1997 GSP LDC and the 2001 AGOA enactment are exogenous. For a significant increase in exports of eligible products from beneficiary countries to be attributable to AGOA or GSP LDC, our double interaction terms (country X product) should not be correlated with export movements before the preferences. If beneficiary countries were seeing a decline [*increase*] in their exports to the US of eligible products prior to AGOA or GSP LDC, estimated impacts that ignore such trends could be downward [*upward*] biased. To account for potential differential pre-treatment trends, Eq. (1) includes treated group-specific time trends, which are the terms inside the large square brackets.³⁰ Thus, the estimated impacts are obtained after controlling for differential dynamics of exports of eligible products by eligible countries prior to the US trade preferences that may have persisted thereafter.

The interpretation of coefficient β_3 in Eq. (1) is that it measures the increase in exports to the US by an AGOA apparel-eligible country of an AGOA-eligible apparel product post-AGOA, relative to the increase in exports of all products to the US by that country, to the increase in exports of that product to the US by all countries, and to the base level of exports of that product to the US by that country before AGOA. This base level is an average of exports of that product by the country prior to becoming eligible for AGOA (typically over the period 1992-2000). The coefficient β_3 is purged of the effect of differential trends in exports of that AGOA-eligible apparel product by the AGOA apparel-eligible country before AGOA (captured by γ_3).

²⁹ The inclusion of this stringent set of fixed effects implies that Eq. (1) is more general and unrestrictive than a pure triple-differences specification as it controls for the ‘levels’ variables through the fixed effects.

³⁰ Wolfers (2006) employs a similar specification. Mora and Reggio (2017) review the studies that propose the use of treated group-specific time trends as a way of addressing potential differences in pre-treatment trends.

The dependent variable in Eq. (1) is defined as the log of US imports at the country-HS 6-digit-year level plus 1, so as to keep all zero trade flows in the estimating sample and address potential selection biases. Hence, Eq. (1) captures the impact of preferential US market access under AGOA or GSP LDC on African countries' exports at intensive and extensive margins. To consider the impact on the extensive margin, we follow Frazer and Van Biesebroeck (2010) and estimate Eq. (1) using as dependent variable an indicator variable for positive trade flows with a linear probability model. Despite the caveat that the predicted probabilities may lie outside the [0,1] interval, Frazer and Van Biesebroeck (2010) suggest this is unlikely to be an actual problem as the impact of AGOA and GSP LDC on the probability of an African country exporting a product to the US is likely to be small, given the set of fixed effects included.

The coefficients in Eq. (1) provide the average impact of GSP LDC and AGOA over the entire period following these policy changes. But a key objective of our paper is to understand the dynamics of those impacts, that is, how quickly African countries increase their exports to the US after the introduction of AGOA and GSP LDC policy changes, and whether the impacts increase, stabilize, or mean-revert over time. To this end, we estimate a variant of Eq. (1) where each interaction term is allowed to have a different coefficient in each year. For the first two interaction terms, this implies separate coefficients for each year from 1998 onwards while for the other interaction terms this implies separate coefficients for each year from 2001 onwards.

6. Estimated average impact of AGOA and GSP LDC on African exports

In this section, we present our baseline results and then carry out three types of robustness tests which demonstrate that on average AGOA and GSP LDC benefitted African exports.

6.1 Baseline results

Table 2 presents the results from estimating Eq. (1) without treated group-specific time trends in column (1) and with such time trends in all other columns. Inference is based on standard errors robust to heteroscedasticity with the Huber-White approach, clustered at the product level.³¹ The estimates in column (1) show positive and significant impacts on exports of African beneficiary countries of GSP LDC and AGOA non-LDC non-apparel and apparel. But our preferred estimates are those in column (2) that correct for the potential presence of differential pre-treatment trends for beneficiary countries and products. They show a positive and significant impact of GSP LDC for beneficiary countries in Africa: on average their exports to the US of the additional products eligible for duty-free treatment under GSP LDC increase by 12 percent from 1998 onwards, relative to pre-1997 levels.³² Regarding the impacts of AGOA, column (2) shows they are insignificant on non-apparel products for non-LDCs and LDCs, in contrast to the significant positive effects in column (1). These results reveal the importance of accounting for treated group-specific time trends. The most important boost to exports to the US provided by AGOA is estimated for apparel products, which increased by 22 percent for AGOA-eligible countries from 2001 onwards relative to pre-AGOA levels.³³

Two crucial remarks need to be made about the estimates in Table 2. First, recall that they are obtained controlling for time-varying country and product changes in US imports, and thus account for any overall surge or drop in US imports from AGOA countries for eligible and non-

³¹ Due to the presence of a very large set of fixed effects, we estimate our equations using the *reghdfe* Stata command drawing on Guimaraes and Portugal (2010) and Correia (2015). The command eliminates from the number of observations singleton groups and adjusts standard errors for their exclusion. A singleton group is a group with only one observation: e.g., for exporting country-HS 6-digit fixed effects, a singleton group is an exporting country-HS 6-digit cell that is imported by the US in a single year.

³² This marginal effect corresponding to the coefficient of 0.114 in Table 2 is obtained as $(e^{0.114}-1)*100$. The impact of GSP LDC on exports of LDCs outside Africa is actually negative and significant.

³³ The treated group-specific trends have a positive and significant coefficient but for apparel the trend is significant only at a 10 percent confidence level.

eligible products as well any overall surge or drop in US imports of AGOA-eligible products or GSP-eligible products globally. Second, they are estimates of a response by African countries to AGOA and GSP LDC at both the intensive and extensive margins of exports to the US, since zeros are included in the estimating sample. Column (3) shows the estimated impacts of AGOA and GSP LDC on the extensive margin of African exports to the US. We find significant increases in a range close to 1 percent in the probability of an eligible country exporting an HS 6-digit product to the US, whether a GSP LDC product or an AGOA apparel product.³⁴

6.2 Robustness: Alternative country and time samples

As robustness checks to the baseline results in Table 2, we exclude from the estimating sample OECD countries in column (4) and non-GSP countries in column (5) to consider potentially more similar control groups for African countries, and China in column (6), given the dramatic increase in its exports to the US over the sample period. Results are similar to those in column (2) and the AGOA apparel coefficient magnitudes are almost unchanged, whereas the GSP LDC coefficient magnitudes decline when OECD countries are dropped.

It is useful to compare our estimates to those in Frazer and Van Biesebroeck (2010). We estimate a smaller average impact of AGOA on apparel products over the 2001-2017 period than they do over the 2001-2006 period, which is not surprising given the yearly effects' pattern in Panel A of Figure 2 that we will discuss in Section 7. Our separate impacts of GSP LDC and AGOA on non-apparel products show a positive and significant average response of exports only

³⁴ In Online Appendix Table C1, non-apparel products are unbundled into three groups - agriculture, manufacturing, and mining – in a re-estimation of Eq. (1) that allows each interaction term to differ across these three groups. The results show that African LDCs increase exports to the US of agriculture and manufacturing products eligible for GSP LDC from 1998 onwards. Manufacturing products whose duty-free treatment is extended to non-LDCs under AGOA also increase significantly as do exports of agriculture products. The impacts of GSP LDC or AGOA on mining products are insignificant.

for GSP LDC products, which raises the concern that their estimated positive impact on non-apparel products confounded the gains from GSP LDC and AGOA. Column (8) of Table 2 uses their 1998-2006 sample period and shows a significantly larger response for apparel products and a smaller response for GSP LDC products, relative to our baseline responses. The differences may be due to our longer pre-AGOA period but also to our control for differential pre-existing trends for treated countries and products.

6.3 Robustness: Export Creation or Export Diversion?

Our findings of an average increase in African exports resulting from US trade preferences under AGOA and GSP LDC can have two interpretations. First, that the increase did not represent new export creation but simply the redirection/diversion of African exports from other trading partners to the US in response to the preferences. Second, that there was indeed a real increase in total exports, possibly accompanied by an increase in exports to other destinations, but it was primarily due to domestic developments in exporting countries, favoring specific products in specific years, such as the establishment of SEZs for apparel which are country-product-year level changes not possible to control for even by our stringent set of fixed effects.

We assess how African exports to other destinations changed in response to the AGOA preferences. If exports to other destinations decline as much as those to the US increase, then trade diversion is likely. If exports to other destinations also increase, then LBD or domestic sector-specific supply side factors are (also) likely to be playing a role. We re-estimate Eq. (1) using EU imports as the dependent variable, given the EU's importance as a major trading partner for most African countries. Column (2) of Table 3 shows a negative and significant coefficient on the AGOA apparel term, suggesting that the AGOA trade preferences reduced African apparel exports

to the EU.³⁵ This decline may be explained by the more stringent ROO in the EU which partially eroded the generous preferences it granted to African LDCs. Our finding of a negative effect of AGOA preferences on apparel exports to the EU stands in contrast with the finding of no trade redirection from the EU by Frazer and Van Biesebroeck (2010), possibly due to their use of a short period before and after AGOA (1999-2000 and 2002-2003).

We also consider potential trade redirection of African exports from non-EU destinations, relying on WITS data over the 1992-2016 period for imports by the US, EU and other countries designated as rest of the world (ROW).³⁶ Column (4) reports a negative and significant coefficient on the AGOA apparel term of imports by the EU plus ROW, indicating that the AGOA trade preference shock reduced African exports of apparel to all countries other than the US. This shows that US trade preferences did not immediately generate economies of scale that could spur growth of apparel exports also to other destinations, and that some of the increase in exports to the US was due to reorientation of installed capacity.³⁷ But column (5) shows that exports by African countries of AGOA apparel (as well as non-apparel) products and GSP LDC products to the combined US, EU plus ROW increase, suggesting that despite evidence of export diversion away from the EU and ROW towards the US, AGOA did lead to export creation reflected in growth in total exports of beneficiary countries.

6.3 Robustness: Omitted Variables

³⁵ Column (1) replicates the estimates for the impact of GSP LDC and AGOA on US imports shown in Table 2 restricting the sample to that used for EU imports (i.e., dropping year 2017 and excluding all 28 EU countries from the control group).

³⁶ Column (3) replicates the estimates for the impact of GSP LDC and AGOA shown in Table 2 on US imports from WITS data.

³⁷ Columns (2) and (4) show that African exports to the EU or EU plus ROW of non-apparel products duty-free in the US under GSP LDC increased. This might suggest that export growth to the US helped African countries increase their exports to other destinations due to economies of scale or LBD mechanisms. But it is not clear why such mechanisms would operate for GSP LDC products and not for apparel products. The absence of cross-destination economies of scale could be due to the fragmentation of apparel manufacturing due to divergent ROO, differences in tastes, and vertical specialization of manufacturing and retail.

The positive impact of trade preferences in Table 2 could be driven by unobserved omitted variables at the exporting country-product-year level, such as domestic sector-specific policy reforms. If this were the case, one would expect to observe a significant increase in apparel exports by AGOA beneficiaries to destination markets besides the US. The negative apparel coefficient in columns (2) and (4) of Table 3 offers evidence against this concern. But in order to systematically account for potential omitted variable biases, we estimate a different type of specification where we pool across the US and the sum of EU and ROW markets such that for each country-HS 6-digit product-year there are two observations. The specification is given by:³⁸

$$\begin{aligned}
\ln(Imp_{cptd}) = & \sum_{r \in (s, ns)} \beta_{1r} \times GSP_p \times GSP_c \times PostGSP_{ct} \times 1\{c \in r\} \times 1\{d = USA\} \\
& + \sum_{j \in (n, e)} \beta_{2j} ANonApp_p \times ANonApp_c \times PostANonApp_{ct} \times 1\{c \in j\} \times 1\{d = USA\} \\
& + \beta_3 AApp_p \times AApp_c \times PostAApp_{ct} \times 1\{d = USA\} \\
& + \left[\sum_{r \in (s, ns)} \gamma_{1r} \times GSP_p \times GSP_c \times \tau \times 1\{c \in r\} \times 1\{d = USA\} \right. \\
& + \sum_{j \in (n, e)} \gamma_{2j} ANonApp_p \times ANonApp_c \times \tau \times 1\{c \in j\} \times 1\{d = USA\} \\
& \left. + \gamma_3 AApp_p \times AApp_c \times \tau \times 1\{d = USA\} \right] + \delta_{cpd} + \delta_{c dt} + \delta_{p dt} + \delta_{cpt} + \epsilon_{cptd}
\end{aligned} \tag{2}$$

where all subscripts and variables are defined as earlier and d is a destination market, the US or the sum of EU and ROW. The differences relative to Eq. (1) are in the additional destination dimension of the data used and the fixed effects included: country-HS 6-digit product-destination δ_{cpd} , country-destination-year $\delta_{c dt}$, and HS 6-digit product-destination-year $\delta_{p dt}$. All coefficients

³⁸ This specification draws on that proposed by Defever and Ornelas (2015) to study third-market effects of the end of the MFA on Chinese apparel exporters.

are estimated based on *within* variation over time for a given country-product-destination. But the coefficient interpretation is now different since the control group relative to which effects of GSP LDC and AGOA are estimated includes also exports by beneficiary countries and products to markets other than the market providing the preference. For example, γ_3 measures the increase in exports to the US by an AGOA apparel-eligible country of an AGOA-eligible apparel product after the AGOA apparel provision is enacted, relative to the overall increase in exports to the US by that country, to the overall global increase in exports to the US of that product, and to the base level of exports to the US by the country-product before AGOA, all of this relative to the exports of that eligible country of those eligible products to the sum of EU and ROW. The results from estimating Eq. (2) are shown in Table 4. Both columns show positive and significant impacts of AGOA apparel and GSP LDC on African exports to the US, relative to the exports to the sum of EU and ROW. These results constitute additional evidence against the idea that the impact of AGOA and GSP LDC on beneficiary African countries are purely driven by domestic policy changes or other developments at the exporting country-product-year level.

7. How durable were the impacts of AGOA and GSP LDC on African Exports?

The estimates in Table 2 show the average impact of GSP LDC and AGOA over the entire post-implementation period, but our key objective is to understand the timing and durability of the effects of those preferences. We show how quickly and persistently African countries respond to the GSP LDC and AGOA policy changes by presenting the coefficients on each interaction term in each year post-implementation (and the corresponding 95 percent confidence intervals) in Figure 2. Panel A shows that the marginal impact of AGOA on exports to the US of apparel products by AGOA-eligible countries starts low but shoots up over the first four years after AGOA

enactment. Specifically, the estimated impact of AGOA on apparel is zero in 2001 and increases rapidly thereafter, reaching 29 percent in 2004. This increase in the impact of AGOA on apparel products over the 2002-2005 period may reflect the time taken by beneficiary countries to learn and build capacity to respond to the expanded market opportunities in the US, or the increase in transshipment of Chinese exports documented by Rotunno et al. (2013). After the MFA ended in 2005, the effect of AGOA on apparel broadly levels off and decreases between 2011 and 2015. The leveling off of marginal impacts of AGOA on apparel exports could be a consequence of the erosion of preferences for African countries after the MFA ended, which led to fiercer competition from Asian giants in the US market.

Panels B-D in Figure 2 focus on the durability of GSP LDC and AGOA impacts on non-apparel products. The impact of GSP LDC on eligible products for African LDCs increases over the first 10 years after 1998, then levels off and declines after 2012 (Panel B), possibly due to the GSP temporary expiration in 2011 discussed by Hakobyan (2020). The impact of AGOA on non-apparel exports that either become duty-free under AGOA for all African countries (Panel C) or whose duty-free treatment under GSP LDC is extended to non-LDCs (Panel D) are insignificant in most years (not diverging from their lack of significance on average in Table 2).

Given our long sample period, it is possible that the effects of trade preferences granted under GSP LDC and AGOA may have been eroded as the US signed multiple preferential trade agreements with non-African countries. In order to capture this effect, we add to the specification in column (7) of Table 2 the competition-adjusted RPM (see Section 4). Higher competition-adjusted RPMs, indicating a higher preference, are linked to significantly higher export growth to the US. As the RPM does not accurately capture the degree of protection in the US for apparel products under MFA quotas, we add an indicator variable for whether the country-product faced

an MFA quota in the US (prior to 2005) and a weighted average of the presence of MFA quotas on competitor countries exporting that product to the US. The effect of the average MFA quota imposed on the rest of the world is insignificant.³⁹ Importantly, accounting for competition from other countries with preferential access to the US reduces only slightly the magnitude of the impact of AGOA on apparel products though the impact on GSP LDC products becomes insignificant.⁴⁰

Our evidence so far shows that the estimated impact of AGOA on apparel increases over time after its enactment 2001 but flattens after 2005. We conjecture that the MFA end in 2005 unleashed the exports of apparel from China and other Asian countries which mitigated substantially the positive impact of AGOA on apparel exports for African countries. The interesting question is whether this lack of durability in the AGOA apparel impacts is heterogeneous across countries, as was hinted at in Section 4 by the differential raw data patterns across four groups of countries. We re-estimate Eq. (1) allowing the coefficient on the AGOA apparel term to vary across years and sub-regions: Central and West Africa, East Africa, and Southern Africa. We plot the corresponding coefficient estimates and 95 percent confidence intervals in Figure 3.

There is a clear difference across sub-regions in the temporal response to AGOA and to the end of the MFA.⁴¹ For Central and West Africa, the impacts of AGOA on apparel exports to the US are mostly insignificant, and there are even signs of a negative impact in the early years.

³⁹ Surprisingly, the effect of the own country-product quota dummy is positive and significant. This may reflect the fact that the MFA quota is endogenous to the export flows, i.e. it was more likely to be imposed when a country-product had experienced significant export growth to the US.

⁴⁰ Online Appendix D presents the results from a robustness check, where we estimate the impact of tariff preferences granted by the US under different schemes using the data on US tariffs at country-product level for the period 1997-2017 instead of treatment indicators. The results indicate that on average US tariff preferences do not significantly increase export growth at the country-product level. However, when the effect is allowed to differ for African and non-African countries, US tariff preferences significantly increase export growth for African countries. When the effect is further allowed to differ across product groups, the results show that US tariff preferences have a significant positive impact on apparel export growth as well as manufacturing export growth from African countries. We view these results as consistent with those based on our triple-differences specification.

⁴¹ We also re-estimate Eq. (1) allowing the AGOA apparel term to have a different coefficient for each African country. Online Appendix D shows cross-country heterogeneity in the impact of AGOA on apparel. The countries with the largest significant positive impacts of AGOA on apparel exports to the US are Kenya, Madagascar, Eswatini, Ethiopia, and Lesotho. In contrast, South Africa, Senegal, Nigeria, and Côte d'Ivoire exhibit a negative impact of AGOA on their apparel exports to the US.

For East Africa, AGOA has a growing positive impact on apparel exports, the impact is significantly lower in the early AGOA period than after the MFA ended. In contrast, for Southern Africa the average impact of AGOA on apparel exports is substantially higher in the early AGOA period and it decreases after the MFA ended in 2005 until it becomes insignificant. While Southern African countries initially took advantage of the opportunities created by AGOA, they suffered more after the MFA was phased out. These patterns are largely consistent with the four apparel stories in Section 4.

Countries that did not take any advantage of the US trade preferences probably faced other binding constraints. The boom-bust or boom-stagnation dynamics observed in many other African countries suggest that while trade preferences helped jump-start their exports, they did not create durable comparative advantage that survived increased competition after 2005 from previously quota-constrained countries such as China. Specific country events like Madagascar's political instability after 2009 show that any benefits of infant industry preferential access could be eroded by broader political and economic shocks. Late success stories may be because the initial inadequacy of domestic conditions was remedied by domestic reforms.

8. Firm-level evidence on the impacts of AGOA

We now consider the firm-level dynamics underpinning the country-level impact of AGOA on apparel exports. To this end, we use customs transaction data for four African countries that represent a spectrum of apparel export experiences: Madagascar, boom-and-bust; Mauritius, boom-and-stagnation; Kenya, reasonably sustained growth; and Ethiopia, late take-off. In each case, we seek evidence of durable benefits of preferential access to the US market.⁴²

⁴² The customs transaction data was collected in the context of the Exporter Dynamics Database described in Fernandes et al. (2016). Details on the data are provided in Online Appendix D.

8.1 What do the firm intensive and extensive margins of export growth reveal?

Customs transaction-level data for Ethiopia, Kenya, and Madagascar are available only for periods after the major US trade policy changes. Nevertheless, the decomposition of apparel export growth to the US into intensive (within-firm for incumbent firms) and extensive (new firms and exiting firms) margins yields some insights. If firms which benefitted from privileged access to foreign markets learned by doing, reduced costs through scale economies, or innovated and became internationally competitive, then we would expect to observe steady export growth along the intensive margin even after trade preferences were reduced (by the MFA end). Export growth along the extensive margin would be consistent with the presence of external economies, e.g., demonstration effects by incumbent exporters on new exporters, country reputation in new foreign markets, or movements of workers across exporting firms with embedded tacit knowledge. The relative importance of internal versus external economies may also reflect differences in types of domestic policies complementing the trade preferences - policies relieving constraints internal to firms versus policies addressing the broader economic environment in which firms operate, respectively.

We consider apparel export growth decompositions in the long-run (2010-2016) shown in Figure 4 and in the short-run (year-to-year) shown in Online Appendix D. First, in Ethiopia and Kenya, much of the strong apparel export growth to the US between 2010 and 2016 came from new exporters rather than from the expansion of exports by incumbent exporters. In Ethiopia, firms did not take any significant advantage of AGOA in the early years and the dominant role played by new exporters in later years is not surprising. Kenyan apparel exports did grow during the early AGOA period but even if firms operating during this period enhanced their competitiveness, the MFA end and the Great Recession seem to have wiped the slate clean by inducing significant

exporter exit. The dominance of new exporters in recent Kenyan apparel export growth casts doubt on LBD internal to firms which benefitted from earlier privileged access – though it is consistent with external economies generated by earlier firms paving the road for subsequent exporters and with industry- or country-level reforms.

Second, Madagascar and Mauritius experienced a bust in apparel exports followed by extensive exit of firms and a recovery led by surviving firms. Madagascar’s bust was mostly determined by the withdrawal of AGOA benefits in 2009 after a political crisis, which were later reinstated in 2015, sparking a recovery. Mauritius’ bust was caused by the MFA end, while the recovery happened after the country was granted liberal ROO in 2009. In both cases the exit of firms shows that the earlier period of AGOA preferential access did not create durable international competitiveness in apparel. The fact that recovery was driven by surviving firms suggests that no significant external economies were sparked by AGOA at the industry or country levels.

8.2 Does the restrictiveness of rules of origin matter?

Mauritius is the only country for which we have customs transaction-level data for a period that is sufficiently long to span all the US trade policy changes (2000-2016) and that was subject to changes in AGOA ROO during the period, from the restrictive double-transformation requirement (the use of African fabric made from US or African yarn) to a more liberal single-transformation requirement (from fabric to garment in an AGOA-eligible country). These changes in ROO enable us to assess the implications of this vital condition for the benefits from preferential access, by distinguishing between four phases of preferential access for apparel exports to the US: (A1) 2000-2001: Rivals face MFA quotas, and exports subject to duties; (A2) 2001-2005: Rivals face MFA quotas, and exports duty-free under AGOA but strict ROO; (B1) 2005-2009: No MFA

quotas, and exports duty-free under AGOA but strict ROO; and (B2) No MFA quotas, and exports duty-free under AGOA with liberal ROO (2009-2016).⁴³ We study how ROO influenced the durability (lack thereof or regain thereof) in the impacts of AGOA on Mauritius. We estimate a triple-differences specification that compares Mauritian firms' exports of eligible and non-eligible products (first-difference) before and after AGOA (second-difference) across the US and the rest of the world (third-difference) given by:

$$\begin{aligned} \ln(\text{Exp}_{ipt}) = & \sum_{j=2001}^{2016} \beta_{1j} 1\{j = y\} \times \text{AGOAp} \times \text{PostAGOAAp} \times 1\{d = \text{USA}\} \\ & + \beta_2 \text{AGOAp} \times \text{PostAGOANonApparel} \times 1\{d = \text{USA}\} + \delta_{ipd} + \delta_{dt} + \delta_{pt} + \epsilon_{ipt} \end{aligned} \quad (3)$$

where Exp is the value exported by firm i of product p (HS6) to destination $d \in \{\text{US}, \text{EU}, \text{ROW}\}$ in year t and ϵ is an i.i.d. residual. The first term on the right-hand side is the key variable of interest: the product between an indicator for an AGOA-eligible apparel product, an indicator for the post-AGOA period (2001-2016), and an indicator for the US. This interaction term is allowed to have a separate coefficient in each year post-AGOA. The second term is the triple interaction term for non-apparel products. Eq. (3) controls for firm-product-destination fixed effects δ_{ipd} , destination-year fixed effects δ_{dt} , and product-year fixed effects δ_{pt} .

Figure 5 displays the point estimates for the triple-differences coefficient on apparel in each year, β_{1j} , along with the 95 percent confidence intervals.⁴⁴ The results suggest that Mauritian firms' apparel exports grew faster in phases (A2) and (B2) than in phase (A1) and declined in phase (B1). This pattern suggests that Mauritius was only competitive in the US market when the preference margin was larger than the cost of complying with the ROO. Moreover, there is no sign

⁴³ The phases are defined with overlapping years because policy changes happened in the middle of those years.

⁴⁴ We find no significant effect on non-apparel products in any year. The results are available upon request.

that the AGOA preferences plus strict ROO in period (B2) equipped Mauritian apparel firms to cope with international competition from the MFA end in period (B1). This finding is at odds with the suggestion in Rotunno et al. (2013) that stricter ROO would have led to greater local value added and more durable benefits. In fact, Mauritian exports only revived when ROO were relaxed in period (B2). The revival was marked by a shift in input sourcing by Mauritian firms, from African fabric made using US or African yarn to the presumably cheaper foreign, mostly Asian, fabric (see Online Appendix Figure D5).

8.3 What explains Ethiopia's late spurt?

A final piece of firm-level evidence on the dynamics of responses to AGOA comes from interviews with exporters in Ethiopia. Enterprise executives in Ethiopia and testimonies corporate executives in the US (described in Online Appendix d) suggest that US tariff preferences played a crucial role in offsetting Ethiopia's cost disadvantages relative to countries like Vietnam due to its lower labor productivity and higher logistics costs. The leading apparel companies said that they would not have set up their production plants in Ethiopia if AGOA preferences did not exist. These statements suggest that AGOA was necessary for the growth of Ethiopian exports.

However, the local production process remains of a "cut-make-trim" type and is characterized by routine steps used to produce basic products using fabric largely imported from Asia. There is so far no significant presence of internationally competitive firms that could survive without preferential access. The interviews suggest that trade preferences boosted apparel export performance but have not yet led to durable competitiveness. Hence, tariff preferences alone were yet not sufficient to boost Ethiopian exports.

The late response of Ethiopia to AGOA preferences, and the importance of SEZs and FDI suggest that the binding constraint in this case was traditional country-level inadequacies, like poor transport infrastructure, high transaction costs, and lack of access to capital, that were partially addressed by SEZs. The future success of Ethiopian exports of apparel to the US will depend on how well learning-by-doing and other dynamic comparative advantage factors materialize for firms inside and outside the SEZs.

9. What explains the heterogeneous impact of AGOA on apparel exports across countries?

Our analysis shows that AGOA had a differential impact on apparel exports across African countries, sub-periods, and sub-regions. While some African countries took advantage of the opportunities created by the US trade preferences, others failed to do so, and the durability of the AGOA impact varies across sub-regions. We consider some factors that could have contributed to such heterogeneous effects.⁴⁵

We re-estimate Eq. (1), allowing the AGOA apparel term to enter by itself but also interacted with policies that could be linked to developing export capacity. We include average tariffs imposed by African countries on their own imports to capture ease of participation in international supply chains, the cost of starting a business as an indicator of the business environment for both domestic and foreign firms, internet access as a channel for knowledge about manufacturing and consumer tastes, and oil rents as an aspect of endowments that could affect competitiveness.⁴⁶

⁴⁵ Frazer and Van Biesebroeck (2010) found differential short-term impacts of AGOA on apparel and non-apparel across countries, but no meaningful correlations of those with measures of corruption, rule of law, or import tariffs imposed by African countries.

⁴⁶ The variables differ across countries and over time. Tariff data are taken from Teti (2020) described in the Online Appendix, the cost of starting a business is taken from the Doing Business database, while the number of internet users per 100 people and oil rents as a percentage of GDP are taken from the World Development Indicators.

The estimates in column (1) of Table 5 show that countries with lower tariffs on imports benefitted significantly more from AGOA. This result could reflect African apparel exporters' dependence on imported inputs and capital goods and suggests that duty-drawback and other indirect mechanisms to exempt exporters from tariffs on intermediate inputs still impose additional transaction costs in sourcing inputs and participating in supply chains (Halpern et al. 2015, Oberfield, 2018), making them a poor substitute for trade liberalization. Column (2) shows a negative impact of the cost of starting a business but the coefficient is statistically insignificant. This may reflect the extent to which policies to attract capital investment have been focused on SEZs and rather than broad-based reform. Column (3) indicates that access to the internet played an important positive role in explaining the differential impact of AGOA on apparel exports. This is consistent with other evidence on the importance of the internet for export performance (Fernandes et al., 2019; Hjort and Poulsen, 2019). Column (4) shows that countries with higher shares of oil revenue in their GDP saw a smaller impact of AGOA on apparel exports, suggesting that rich natural resource endowments make it difficult for countries to take advantage of the trade preferences offered to manufacturing products, consistent with a Dutch Disease effect.

To probe deeper into the heterogeneity in short-term and long-term apparel export performance in response to AGOA across African countries, we allow the interaction between the apparel treatment variable and the four variables considered above to have a different coefficient before and after the MFA ended: i.e., in 2001-2004 and in 2005-2017. The estimates in columns (5)-(8) suggest that average tariffs, the cost of starting a business, and oil rents help explain differences in African countries' ability to take advantage initially of AGOA preferences but access to the internet does not. However, differences in the ability to sustain export performance

when preferences were eroded due to the MFA end are related to average tariffs, oil rents, and access to the internet rather than the cost of starting a business.

Finally, a hard-to-measure factor that may have played a role in some countries is the establishment of SEZs as islands of improved policy, institutions, and infrastructure, allowing duty-free access to imported inputs, streamlined business regulation and improved connectivity. The number of SEZs in Africa has grown over the last two decades. As of 2016, 79 SEZs were active in 46 African countries and of those, 52 are located in Kenya, 6 of which focus exclusively on apparel manufacturing (Newman and Page, 2017). Farole (2011) shows strong export performance of SEZs in Kenya and Lesotho, both of which benefited significantly from AGOA preferences in the 2000-2004 period (while competition from Asia was limited). But he also suggests those SEZs did not help to counteract the countries' declining apparel export competitiveness in the US after the MFA ended, experiencing export stagnation and employment losses from 2005 to 2008 (when his analysis ends). The recent growth of SEZs in Ethiopia has been concurrent with its late apparel export spurt to the US. Our firm-level interviews strongly suggest that AGOA was a key factor for recent investments by foreign companies in Ethiopian SEZs. But there are also numerous examples of unsuccessful SEZs in Africa, and we still do not fully understand why only a few countries have been able to create the few successful ones (World Bank, 2019).

10. Conclusion

In this paper, we analyzed the impact of preferential access to the US market on African exports. We focused mostly on apparel exports because the policy changes affecting that sector enable us to assess the durability of the impact of trade preferences, by examining whether export

gains survive the erosion of preferences. We carried out our analysis at three levels: the average impact of AGOA on beneficiary countries and its durability; the heterogeneous effects across individual countries; and firm-level export dynamics in selected countries.

We found that the average impact of AGOA on apparel exports of beneficiary countries to the US is significantly positive. While there is evidence of export diversion from other destinations, i.e., the EU and the rest of the world, aggregate exports also increased. Thus, the export creation aspects of AGOA outweigh the trade diversion aspects. The fact that exports to other destinations declined suggests that any economies of scale fostered by preferential access did not lead to big increases in international competitiveness of African apparel exporters. More importantly, the decline demonstrates that export growth to the US market was not driven solely by supply-side improvements in African countries. The specification in which we pooled exports to different destinations, and included country-product-year fixed effects, offers further evidence that AGOA boosted exports to the US even after controlling for the impact of domestic reforms.

Given our interest in the durability of the impact of AGOA, we considered separately the impact on exports to the US for each year from 2001 onwards. We found an increase in marginal impacts on apparel exports during a first period (2001-2004) in which African countries enjoyed high preference margins over other countries, especially the quota-constrained Asian countries, and then a leveling-off during a second period (2005-2017) after the MFA ended which led to an erosion in the preference margins.

Turning to region- and country-level export performance revealed considerable heterogeneity. Central and West Africa were not able to take any meaningful advantage of the opportunities offered by AGOA. Southern Africa saw the significant positive marginal impact in the first period decline in the second period until it was insignificant. East Africa presented the

only example of a significant and growing positive marginal impact in both periods. However, this regional picture of East Africa is made up of interestingly different country pictures: Kenya alone stands out as a country whose exports responded positively in both periods; Ethiopia, Rwanda and Tanzania saw little impact in the first period and a strong positive impact in the second period.

Firm-level customs data helped us take a closer look at the exporter dynamics underlying Kenya and Ethiopia's export growth. It turned out that Kenya saw significant exit of exporters that began when the MFA quotas were phased out and continued during the Great Recession. The revival in Kenya's exports after 2010 was mostly driven by new entrants rather than firms that had benefited from large preference margins during the early AGOA period. Ethiopian firms did not take any significant advantage of AGOA in the early years and much of the apparel export growth after 2010 also came from new exporters. Thus, in neither of these countries do we see evidence of significant growth along the intensive margin by firms whose international competitiveness might have been nurtured by earlier preferential access to the US market.

What does this evidence reveal about the impact of AGOA, and whether preferential access led to sustained improvements in performance? There is compelling evidence that AGOA had a positive impact on African exports to the US beyond any impetus from supply-side improvements over the period. However, the poor performance of Central and Western Africa, and the delayed spurt in most East African countries, demonstrates that preferential access per se did not lead to and was therefore not sufficient for sustained export growth. The role of new firms in Ethiopia and Kenya's recent export dynamism suggests that if preferential access created longer-term comparative advantage, it was by inducing improvements at the country-level rather than at the firm-level. One promising development is the recent performance of Ethiopia, Rwanda, and

Tanzania which suggests that what Zhou Enlai reportedly said about the impact of the French Revolution may also apply to the consequences of AGOA: it is too early to say.

Understanding the precise reasons for the heterogeneous response to trade preferences remains a challenge. The few instances of export growth seem to have combined market access with domestic reforms that improved access to imported inputs through low domestic tariffs, lightened the regulatory burden and enhanced access to infrastructure (in some countries through the creation of effective SEZs). Further research is needed in this area.

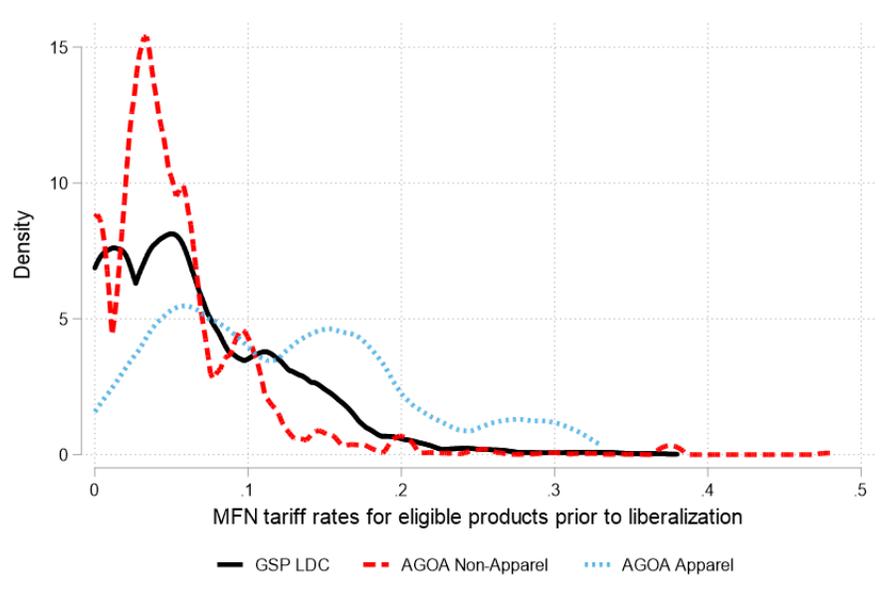
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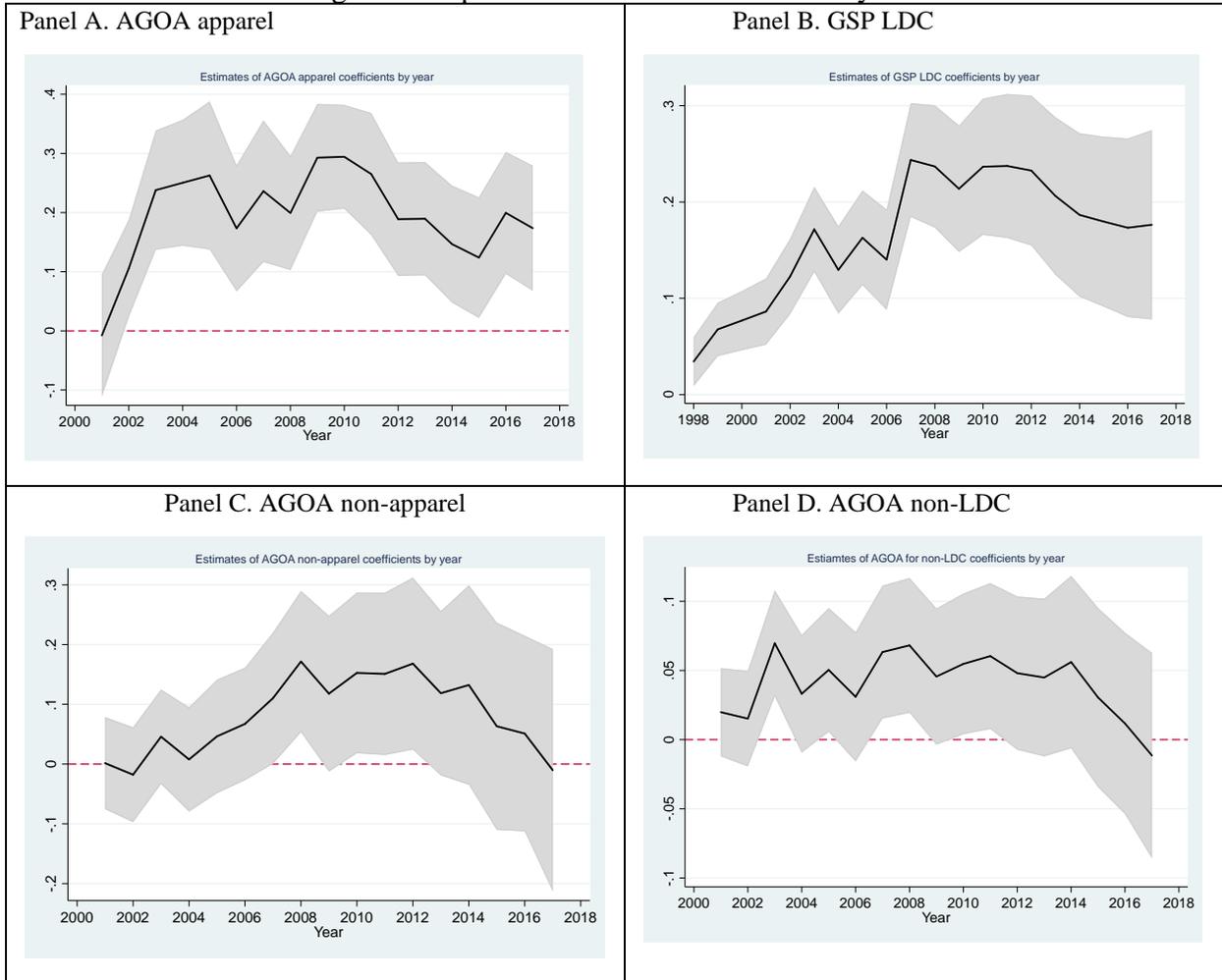
Figure 1. Distribution of US MFN tariffs on GSP LDC and AGOA eligible products prior to liberalization



Source: US database described in Section 2.

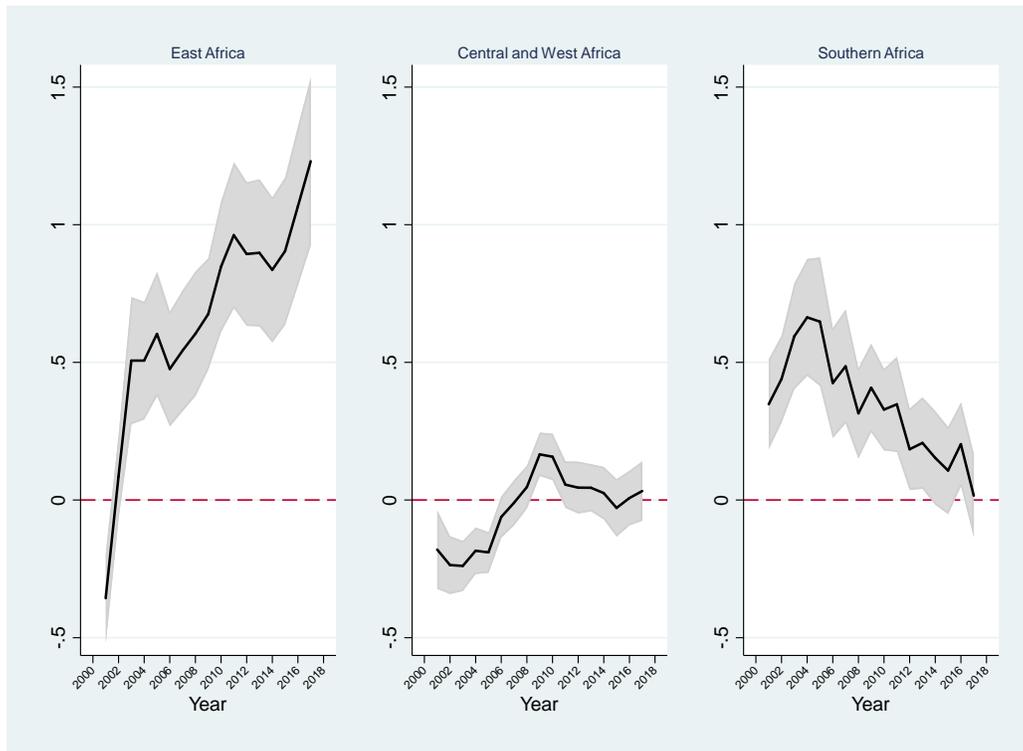
Note: The MFN tariff rates for GSP LDC-eligible products are for 1997 while the MFN tariff rates for AGOA-eligible products are for 2000. For readability, the distribution of MFN tariff rates for GSP LDC excludes HS 8-digit product 29224310 whose tariff rate was 114 percent in 1997.

Figure 2. Impact of AGOA and GSP across years



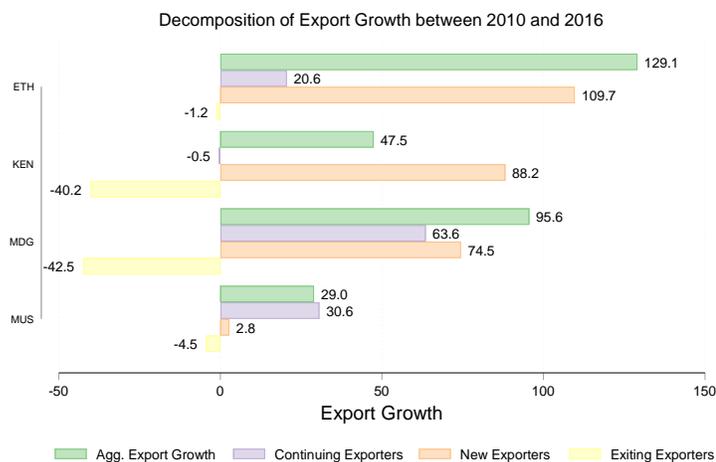
Notes: figures show coefficients and 95 percent confidence intervals based on robust standard errors, clustered by HS 6-digit product obtained by estimating Eq. (1) allowing for separate coefficients in each year after 1997 for GSP LDC (panel B) or 2001 for AGOA (panels A, C, and D).

Figure 3. Impacts of AGOA on apparel across years and sub-regions in Africa



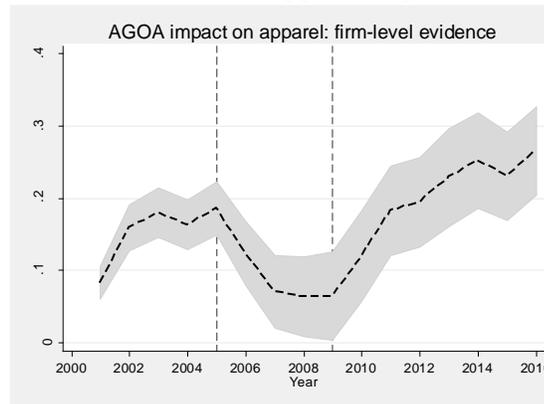
Notes: figures show coefficients and 95 percent confidence intervals based on robust standard errors, clustered by HS 6-digit product obtained by estimating Eq. (1) allowing for separate coefficients in each year after 2001 for AGOA and for separate coefficients for each sub-region in Africa.

Figure 4: Apparel export growth decomposition



Notes: the figure shows long-term growth decomposition between 2010 and 2016 of apparel exports to the US for Ethiopia (ETH), Kenya (KEN), Madagascar (MDG) and Mauritius (MUS). The formula for the decomposition is provided in the Online Appendix.

Figure 5: Impact of AGOA on Mauritius apparel exports: firm-level evidence



Notes: the figure shows coefficients and 95 percent confidence intervals based on robust standard errors, clustered by HS 6-digit product obtained by estimating Eq. (3). The regression is based on 4,916,706 observations at the firm-HS6-destination-year level (with the three destinations being US, EU and ROW) including zeroes in export flows. These observations correspond to the export transactions of 5,566 firms. The first dotted vertical line indicates the switch into period (B1) with strict ROO while the second dotted vertical line indicates the switch into period (B2) with liberal ROO.

Table 1. US Tariff Schedule, GSP and AGOA for African countries

Panel A. Number of Tariff Lines and Share of Exports to the US by African Country Sub-Group

	Number of US tariff lines (HTS 8-digit)		% of Exports to US	
	LDC	Non-LDC	LDC	Non-LDC
MFN Zero	3,131	3,131	9%	28%
GSP duty-free	3,507	3,507	1%	4%
GSP LDC duty-free	1,670		79%	
AGOA Apparel	555	555	11%	3%
AGOA Non-LDC		1,610		64%
AGOA Only	225	225	0%	0%
No Preference (MFN>0)	1,096	1,156	0%	1%
Total	10,184	10,184	100%	100%

Panel B. US MFN tariff rates on GSP LDC-eligible or AGOA-eligible HS 6-digit products

		AGOA/GSP Countries			
		GSP	AGOA	AGOA	AGOA
		LDC	Non-LDC	Only	Apparel
		(810)	(769)	(91)	(239)
US MFN tariff rate	Mean	5.0%	4.3%	7.3%	11.2%
	Maximum	21.9%	10.0%	13.3%	15.6%

Source: US database described in Section 2.

Notes: in Panel A the number of tariff lines and total exports are for 2001 and the LDC and Non-LDC African country exports include only the exports of the 46 countries that are AGOA-eligible between 2001 and 2017 (therefore they do not account for country-year specific eligibility and they also do not account for preference utilization). Panel B shows the average and maximum MFN tariff computed across the HS 6-digit products part of the category listed in the column heading. The total number of eligible HS 6-digit products in each category is shown in parentheses.

Table 2. Baseline impacts of GSP LDC and AGOA and robustness checks

	Data at exporting country-HS 6-digit-year level (including zeros) is used							
	Dependent variable is:							
	Log (US imports + 1)	Log (US imports + 1)	Dummy for positive US imports	Log (US imports + 1)				
	Baseline (1)	Baseline (2)	Baseline (3)	Robustness (4)	Robustness (5)	Robustness (6)	Robustness (7)	Robustness (8)
GSP LDC * Africa	0.215*** (11.49)	0.114*** (6.70)	0.008*** (5.60)	0.063*** (5.29)	0.102*** (6.06)	0.116*** (6.90)	-0.006 (-0.77)	0.033*** (3.90)
GSP LDC * Non-Africa	0.004 (0.22)	-0.046* (-2.43)	-0.005** (-2.95)	-0.084*** (-4.97)	-0.051** (-2.74)	-0.044* (-2.34)	-0.159*** (-5.92)	-0.092*** (-3.70)
AGOA Non-LDC	0.105*** (6.49)	0.027 (1.86)	-0.0001 (-0.06)	-0.009 (-0.71)	0.026 (1.77)	0.028 (1.90)	-0.019 (-1.52)	-0.005 (-0.35)
AGOA Non-apparel	0.210*** (4.66)	0.0633 (1.74)	0.0008 (0.26)	0.018 (0.59)	0.061 (1.58)	0.059 (1.63)	-0.019 (-0.49)	0.007 (0.23)
AGOA apparel	0.254*** (5.40)	0.200*** (4.78)	0.012*** (3.63)	0.185*** (4.47)	0.180*** (4.42)	0.198*** (4.74)	0.168*** (3.88)	0.275*** (8.23)
Competition-adjusted relative preference margin							0.530*** (4.73)	
Indicator for MFA quota							0.799*** (11.49)	
Average MFA quotas on competitors							0.567 (1.04)	
Treatment group-specific time trends	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-product fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27,420,560	27,420,560	27,420,560	22,944,154	17,677,794	27,288,901	21,904,250	9,491,040

Notes: Robust t-statistics in parentheses, clustered by HS 6-digit product. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. Estimates for Eq. (1) shown in columns (2)-(8) and for a variant of Eq. (1) excluding treated group-specific time trends in column (1).

Table 3. AGOA and redirection of African exports

	Data at country-HS 6-digit-year level (including zeros) is used				
	Dependent variable is:				
	Log (US imports + 1)	Log (EU imports + 1)	Log (US imports + 1)	Log (EU+ROW imports + 1)	Log (US + EU + ROW imports + 1)
	COMEX data (1)	COMEX data (2)	WITS/COMTRADE data (3)	WITS/COMTRADE data (4)	WITS/COMTRADE data (5)
GSP LDC * Africa	0.126*** (6.79)	0.053*** (4.57)	0.125*** (6.81)	0.081*** (5.08)	0.075*** (3.95)
GSP LDC * Non-Africa	-0.033 (-1.67)	0.031** (2.78)	-0.036 (-1.86)	0.047** (3.03)	-0.037 (-1.88)
AGOA Non-LDC	0.031 (1.94)	-0.004 (-0.43)	0.038* (2.43)	0.019 (1.28)	-0.001 (-0.07)
AGOA Non-apparel	0.059 (1.56)	0.028 (1.36)	0.070 (1.79)	0.078** (2.64)	0.096** (2.72)
AGOA apparel	0.202*** (5.04)	-0.067*** (-6.54)	0.196*** (4.73)	-0.116*** (-9.42)	0.127*** (3.38)
Treatment group-specific time trends	Yes	Yes	Yes	Yes	Yes
Country-product fixed effects	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes
Product-year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	24,588,684	24,588,684	25,445,675	25,445,675	25,445,675

Notes: Robust t-statistics in parentheses, clustered by HS 6-digit product. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. Estimates for Eq. (1) with alternative dependent variables shown. The estimating sample covers years 1992-2016 and excludes all 28 EU countries from the control group in all columns.

Table 4. AGOA and exports to US and other markets

	Data at country-HS 6-digit-destination-year level (including zeros) is used	
	Dependent variable is:	
	Log (imports + 1)	Log (imports + 1)
	WITS/COMTRADE data	
	(1)	(2)
GSP LDC * Africa	0.225*** (14.38)	0.273*** (12.94)
GSP LDC * Non-Africa	0.066*** (4.09)	0.133*** (6.68)
AGOA Non-LDC	0.113*** (7.79)	0.178*** (8.31)
AGOA Non-apparel	0.139*** (3.55)	0.155** (2.75)
AGOA apparel	0.169*** (3.95)	0.201*** (4.23)
Treatment group-specific time trends	Yes	Yes
Country-product-destination fixed effects	Yes	Yes
Country-destination-year fixed effects	Yes	Yes
Product-destination-year fixed effects	Yes	Yes
Country-product-year fixed effects	No	Yes
Observations	52,866,235	50,891,350

Notes: Robust t-statistics in parentheses, clustered by HS 6-digit product. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. Estimates for Eq. (2) shown. The estimating sample covers years 1992-2016 and excludes all 28 EU countries from the control group.

Table 5. Impacts of AGOA on apparel and the role of domestic policy, institutions, infrastructure and endowments

	Data at country-HS 6-digit-year level (including zeros) is used							
	Dependent variable is log (US imports + 1)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GSP LDC * Africa	0.114*** (6.70)	0.121*** (6.73)	0.115*** (6.49)	0.112*** (6.59)	0.112*** (6.63)	0.121*** (6.73)	0.115*** (6.49)	0.112*** (6.59)
GSP LDC * Non-Africa	-0.046* (-2.43)	-0.044* (-2.34)	-0.044* (-2.32)	-0.045* (-2.37)	-0.046* (-2.43)	-0.044* (-2.34)	-0.044* (-2.32)	-0.045* (-2.37)
AGOA Non-LDC	0.028 (1.92)	0.020 (1.08)	0.020 (1.04)	0.025 (1.60)	0.027 (1.83)	0.020 (1.07)	0.020 (1.04)	0.025 (1.59)
AGOA Non-apparel	0.063 (1.74)	0.069 (1.44)	0.091 (1.60)	0.042 (1.11)	0.063 (1.72)	0.068 (1.44)	0.091 (1.60)	0.042 (1.11)
AGOA apparel	0.390*** (4.97)	0.237*** (4.46)	0.142** (3.18)	0.231*** (5.36)	0.408*** (5.14)	0.236*** (4.45)	0.143** (3.14)	0.233*** (5.38)
AGOA apparel * Avg. import tariff	-0.017*** (-3.95)							
AGOA apparel * Cost to start a business		-0.0001 (-1.71)						
AGOA apparel * Internet users			0.049** (3.25)					
AGOA apparel * Oil rents as % of GDP				-0.015*** (-7.32)				
AGOA apparel * Avg. import tariff * 2001-2004					-0.029*** (-6.13)			
AGOA apparel * Avg. import tariff * 2005-2017					-0.009* (-2.20)			
AGOA apparel * Cost to start a business * 2001-2004						-0.001*** (-3.32)		
AGOA apparel * Cost to start a business * 2005-2017						-0.000 (-0.06)		
AGOA apparel * Internet users * 2001-2004							-0.213 (-0.23)	
AGOA apparel * Internet users * 2005-2017							0.049** (3.12)	
AGOA apparel * Oil rents as % of GDP * 2001-2004								-0.029*** (-5.40)
AGOA apparel * Oil rents as % of GDP * 2005-2017								-0.014*** (-7.04)
Treatment group-specific time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-product fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27,420,560	26,310,236	25,889,429	26,893,286	27,420,560	26,310,236	25,889,429	26,893,286

Notes: Robust t-statistics in parentheses, clustered by HS 6-digit product. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. Estimates for a variant of Eq. (1) with interactions with several variables shown.

**Online Appendix to “Are Trade Preferences a Panacea?
The Export Impact of the African Growth and Opportunity Act”**

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February 2021

Appendix A: AGOA and GSP eligibility

Appendix Table A1. AGOA eligibility across countries and over time

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Angola				X	X	X	X	X	X	X	X	X	X	X	X	X	X
Benin	X	X	X	X	X ¹²												
Botswana	X ¹	X ¹²															
Burkina Faso					X	X ¹²											
Burundi						X	X	X	X	X	X	X	X	X	X		
Cameroon	X	X ¹²															
Cape Verde	X	X ¹²															
Cen African Rep	X ¹²	X ¹²	X ¹²														X ¹²
Chad	X	X	X	X	X	X ¹²											
Comoros								X	X	X	X	X	X	X	X	X	X
Congo (DROC)			X	X	X	X	X	X	X	X							
Congo (ROC)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cote d'Ivoire		X	X ¹²	X ¹²							X	X	X ¹²				
Djibouti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Eritrea	X	X	X														
Ethiopia	X ¹²																
Gabon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gambia			X	X	X	X	X	X ¹²									
Ghana	X	X ¹²															
Guinea	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
Guinea-Bissau	X	X	X	X	X	X	X	X	X	X	X				X	X	X
Kenya	X ¹²																
Lesotho	X ¹²	¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²				
Liberia							X	X	X	X	X ¹²						
Madagascar	X ¹²					X	X	X	X								
Malawi	X ¹²																
Mali	X	X	X ¹²		X	X	X	X									
Mauritania	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X
Mauritius	X ¹	X ¹	X ¹	X ¹²	X ¹²	X ¹	X ¹²										
Mozambique	X	X ¹²															
Namibia	X	X ¹²															
Niger	X	X	X	X ¹²		X ¹²											
Nigeria	X	X	X	X ¹²													
Rwanda	X	X	X	X ¹²													
Sao Tome & Prin	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Senegal	X	X ¹²															
Seychelles	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Sierra Leone	X	X	X	X ¹²													
South Africa	X ¹																
South Sudan													X	X			
Swaziland	X ¹²																
Tanzania	X	X ¹²															
Togo							X	X	X	X	X	X	X	X	X	X	X
Uganda	X ¹²																
Zambia	X ¹²																

Note: X eligible for AGOA, ¹ eligible for apparel provisions, ² eligible for LDBC special rule. Equatorial Guinea, Somalia, Sudan, and Zimbabwe have never been eligible for AGOA.

Appendix Table A2. GSP and GSP-LDC eligibility across countries and over time

Country	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
Angola	X	X	X ¹																				
Benin	X	X	X ¹																				
Botswana	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Br Indian O Ter	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Burkina Faso	X	X	X ¹																				
Burundi	X	X	X ¹																				
Cameroon		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cape Verde	X	X	X ¹	X	X	X	X	X	X	X	X												
Cen African Rep	X	X	X ¹																				
Chad	X	X	X ¹																				
Comoros	X	X	X ¹																				
Congo (DROC)	X	X	X ¹																				
Congo (ROC)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cote d'Ivoire	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Djibouti	X	X	X ¹																				
Eq Guinea	X	X	X ¹																				
Eritrea					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ethiopia		X	X ¹																				
Gabon				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gambia	X	X	X ¹																				
Ghana	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Guinea	X	X	X ¹																				
Guinea-Bissau	X	X	X ¹																				
Kenya	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lesotho	X	X	X ¹																				
Liberia												X ¹											
Madagascar	X	X	X ¹																				
Malawi	X	X	X ¹																				
Mali	X	X	X ¹																				
Mauritania				X	X ¹																		
Mauritius	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mozambique	X	X	X ¹																				
Namibia	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Niger	X	X	X ¹																				
Nigeria					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rwanda	X	X	X ¹																				
Sao Tome & Prin	X	X	X ¹																				
Senegal	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X ¹					
Seychelles	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sierra Leone	X	X	X ¹																				
Somalia	X	X	X ¹																				
South Africa	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
South Sudan																		X ¹					
Sudan																							
Swaziland	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tanzania	X	X	X ¹																				
Togo	X	X	X ¹																				
Uganda	X	X	X ¹																				
Zambia	X	X	X ¹																				
Zimbabwe	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Note: X eligible for GSP, ¹ eligible for GSP-LDC

Appendix B: Summary statistics and additional data issues

1. Summary statistics on estimating sample

Appendix Table B1. Summary statistics on estimating sample

Panel A. Number of HS 6-digit products and US imports for AGOA and control countries

	Number of HS 6-digit Products and US Imports			
	AGOA Countries (44)		Control Countries (164)	
	Mean	Standard Deviation	Mean	Standard Deviation
Number of HS 6-digit products per country (with imports>0)	97	240	734	1,068
Number of AGOA eligible HS 6-digit products per country (with imports>0)	28	57	188	226
Log (imports) per country-HS 6-digit product	9.84	1.05	10.71	1.25
Log (imports +1) per country-HS 6-digit product	0.24	0.57	1.91	2.59

Panel B. Number of GSP LDC-eligible or AGOA-eligible HS 6-digit products for AGOA countries

		AGOA/GSP Countries			
		GSP LDC (810)	AGOA Non-LDC (769)	AGOA Only (91)	AGOA Apparel (239)
		For products with imports> 100			
Number of HS 6-digit products per country	Mean	4	26	5	23
	Max	11	195	34	120

Note: In Panel B the total number of products in the HS classification at 6-digits is 5,070 and each cell shows the average across AGOA countries over the sample period.

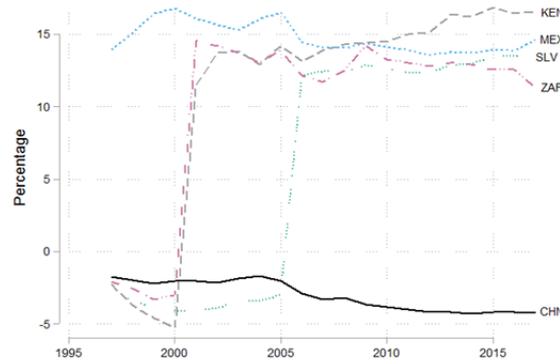
2. Relative preference margin

The formula for the RPM is based on Nicita (2011) and is given by:

$$RPM_j^{US} = \sum_{hs} X_{j,hs}^{US} \left(\frac{\sum_V X_{v,hs}^{US} t_{US,hs}^v}{\sum_V X_{v,hs}^{USA}} - t_{US,hs}^j \right) / \sum_{hs} X_{j,hs}^{US}$$

where j is the country exporting to the US, X is export value, V are other exporting countries competing with country j, t is the tariff paid in the US, hs is an HS 8-digit product. Relative to Nicita (2011) we simplify the formula in that we do not consider trade elasticities thus assuming that all countries' export flows react similarly to a reduction in tariffs. Ideally, to calculate the true preference margin, we would also include the tariff-equivalent of the quotas of the MFA and the impact of its end on the preference margins, but this exercise is beyond of scope of this study.

Appendix Figure B1. Relative preferential margins in apparel for selected countries

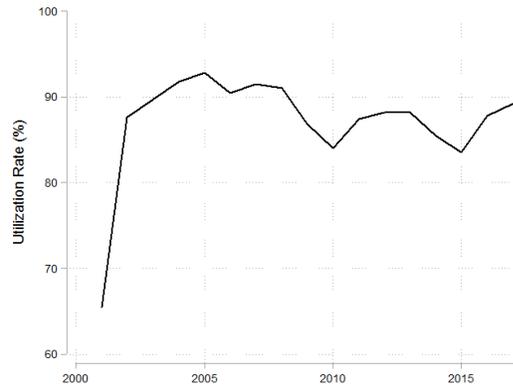


Source: US database described in Section 2 in the paper.

3. Preference utilization

The low utilization rate observed in the first couple of years of AGOA in the figure below is likely due to an imprecision in our definition of eligibility to AGOA for a given country by year whereas AGOA entered into force for different countries in different months of the year. Non-utilized preferences in recent years are mostly accounted for by oil-related products for which the US MFN duty is very low (less than 1 percent).

Appendix Figure B2. AGOA preference utilization



Source: US database described in Section 2 in the paper.

Notes: the utilization rate is defined as the share of dutiable preference-eligible imports that enter the US (originating in SSA countries) using AGOA in each year. Imports entering under different duty-free eligible programs are excluded from the calculation.

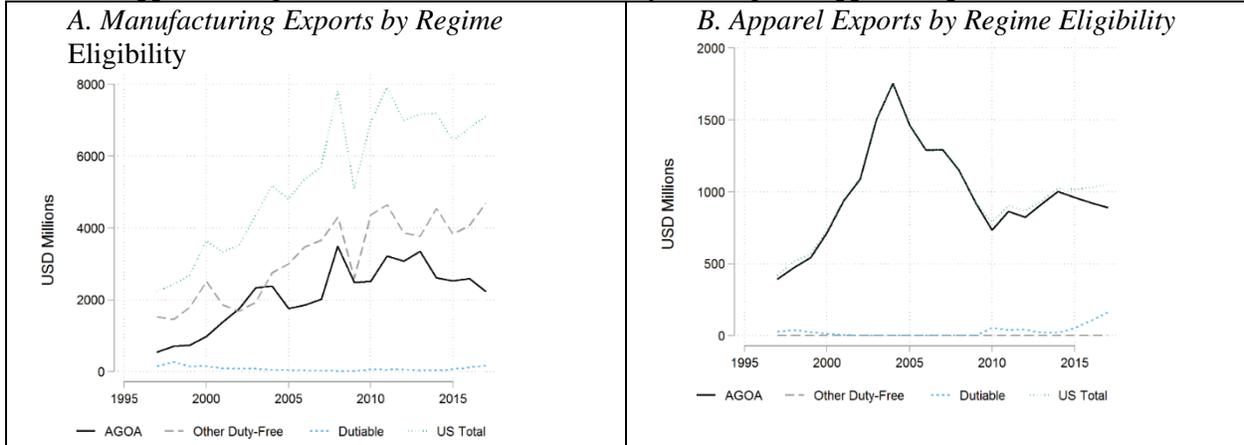
4. Additional tariff data

In the regression analysis in Section 7 of the paper, we use the average MFN import tariff imposed by each AGOA country in each year. The tariffs are taken from a newly constructed database by Teti (2020), which is based on the TRAINS and IDB databases. We use MFN tariffs averaged at the country-year level.

5. African exports to the US

Below we link SSA export performance to GSP LDC and AGOA by decomposing graphically the export flows into AGOA-eligible, other duty-free eligible (MFN zero, GSP, and GSP LDC), and dutiable exports.

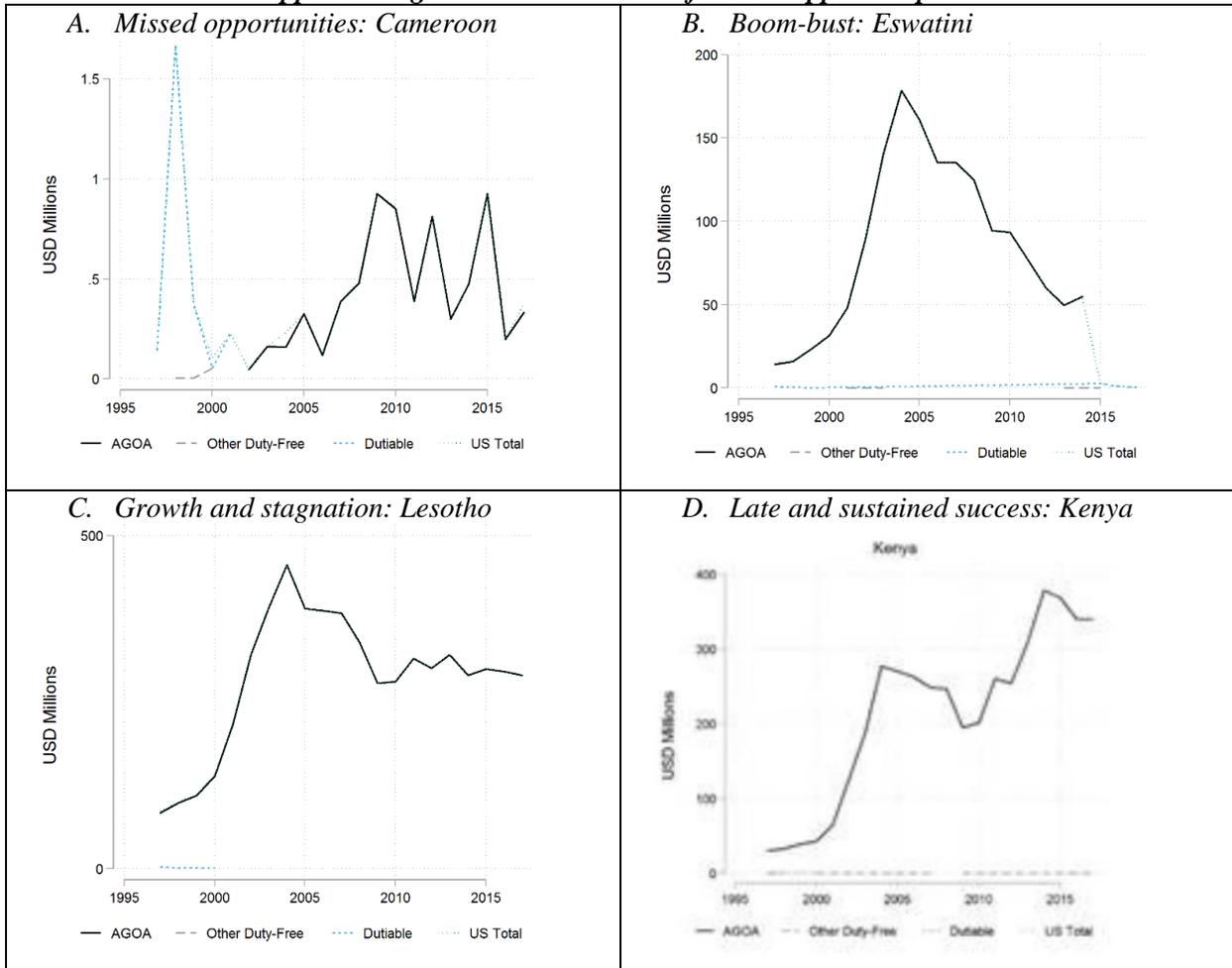
Appendix Figure B3. AGOA and SSA manufacturing and apparel exports to the US



Source: US database described in Section 2.

Note: Exports are classified by tariff regime eligibility by product-country-year and do not account for preference utilization. Eligibility for AGOA is extended before 2001 in the graphs for easier comparison.

Appendix Figure B4. Four stories of AGOA apparel exports



Source: US database described in Section 2.

Notes: Exports are classified by tariff regime eligibility by product-country-year and do not account for preference utilization. Eligibility for AGOA is extended before 2001 in the graphs for easier comparison. The other countries in the group of Panel A are Côte d'Ivoire, Ghana, Sierra Leone, Seychelles, and Zambia. The other countries in the group of Panel B are Botswana, Cape Verde, Madagascar, Malawi, Mozambique, Namibia, South Africa, and Uganda. The other country in the group of Panel C is Mauritius. The other countries in the group of Panel D are Ethiopia, Rwanda, and Tanzania.

Appendix C: Additional regression results

Appendix Table C1. Baseline impacts of AGOA and GSP allowing for sub-groups in non-apparel

	Data at country-HS 6-digit-year level	
	Dependent variable is:	
	Log (imports + 1)	Dummy for positive US imports
	(1)	(2)
GSP LDC * Africa * Agriculture	0.060* (2.14)	0.003 (1.13)
GSP LDC * Africa * Manufacturing	0.146*** (6.86)	0.010*** (6.15)
GSP LDC * Africa * Mining	-0.112 (-0.69)	-0.009 (-0.77)
GSP LDC * Non-Africa * Agriculture	-0.075** (-2.77)	-0.007** (-3.01)
GSP LDC * Non-Africa * Manufacturing	-0.029 (-1.28)	-0.003 (-1.80)
GSP LDC * Non-Africa * Mining	-0.132 (-1.69)	-0.010 (-1.88)
AGOA Non-LDC * Agriculture	0.007 (0.28)	-0.002 (-0.91)
AGOA Non-LDC * Manufacturing	0.047** (2.58)	0.002 (0.98)
AGOA Non-LDC * Mining	-0.287 (-1.52)	-0.023 (-1.64)
AGOA Non-apparel * Agriculture	0.147* (2.34)	0.011* (2.02)
AGOA Non-apparel * Manufacturing	0.040 (0.93)	-0.002 (-0.52)
AGOA apparel	0.200*** (4.78)	0.012*** (3.63)
Treatment group-specific time trends	Yes	Yes
Country-product fixed effects	Yes	Yes
Country-year fixed effects	Yes	Yes
Product-year fixed effects	Yes	Yes
Observations	27,420,560	27,420,560

Notes: Robust t-statistics in parentheses, clustered by HS 6-digit product. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. Estimates of a variant of Eq. (1) allowing for separate coefficients for agriculture, manufacturing, and mining sub-sectors shown.

As an alternative to Eq. (1) we use detailed data on the tariffs that the US applied to all HS 6-digit products and all countries over the period 1997-2017, to estimate the trade effects of tariff preferences granted by the US under different schemes, including AGOA, using the following specification:

$$\ln(\text{Imp}_{cpt}) = \gamma(\tau_{cpt}^{MFN} - \tau_{cpt}^{Pref}) \times 1[c \in AFR] + \gamma(\tau_{cpt}^{MFN} - \tau_{cpt}^{Pref}) \times 1[c \in NonAFR] + \delta_{cp} + \delta_{ct} + \delta_{pt} + \epsilon_{cpt} \quad (D1)$$

where $\tau_{cpt}^{MFN} - \tau_{cpt}^{Pref}$ is the difference between the MFN tariff rate and the best available US preferential tariff rate. As in Equation (2) we control for a stringent set of fixed effects: country-product, country-year, and product-year. Since Eq. (D1) relies on a continuous tariff preference variable (which captures the magnitude of the trade preference) rather than discrete country-product treatment groups, we do not control for treated group-specific time trends. The coefficient of interest γ captures the trade effects of the tariff preferences given to a country-product pair relative to the average export of that country-product pair. To capture the trade effect of the tariff cuts provided to African countries, we include the tariff preference

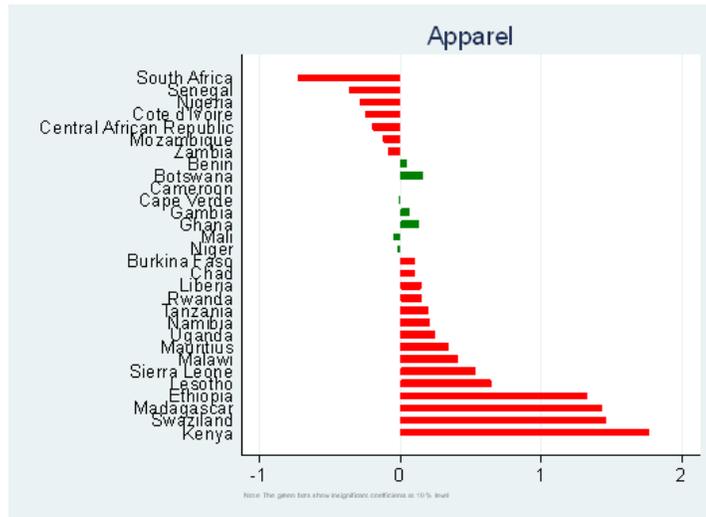
variable twice: once interacted with an indicator for African countries and once interacted with an indicator for non-African countries.

Appendix Table C2. Impacts of US preference margins

	Data at country-HS 6-digit-year level (including zeros) is used		
	Dependent variable is:		
	Log (imports + 1)	Log (imports + 1)	Log (imports + 1)
	(1)	(2)	(3)
Preference margin	0.007 (1.01)		
Preference margin * Africa		1.650*** (8.90)	
Preference margin * Non-Africa		-0.0003 (-0.39)	
Preference margin * Africa * Agriculture			0.370*** (3.44)
Preference margin * Africa * Apparel			3.360*** (8.23)
Preference margin * Africa * Manufacturing			1.567*** (9.40)
Preference margin * Africa * Mining			-1.257 (-0.74)
Preference margin * Non-Africa * Agriculture			0.358 (1.95)
Preference margin * Non-Africa * Apparel			-2.423*** (-3.95)
Preference margin * Non-Africa * Manufacturing			0.0002 (0.37)
Preference margin * Non-Africa * Mining			6.317*** (5.58)
Country-product fixed effects	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes
Product-year fixed effects	Yes	Yes	Yes
Observations	21,931,483	21,931,483	21,931,483

Notes: Robust t-statistics in parentheses, clustered by HS 6-digit product. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. Estimates for Eq. (D1) are shown.

Appendix Figure C1. Baseline impacts of AGOA on apparel by country



Note: figure shows coefficients and 95 percent confidence intervals based on robust standard errors, clustered by HS 6-digit product obtained by estimating Eq. (1) allowing for separate coefficients for each African country.

Appendix D. Firm-level analysis

D1) Customs transaction-level data

Our analysis makes use of exporter-level data from customs for Ethiopia, Kenya, Madagascar and Mauritius, collected in the context of the Exporter Dynamics Database described in Fernandes et al. (2016). Each country’s dataset covers the universe of raw export transactions obtained from the local customs agency and includes information at the exporter-product-destination-year level based on six variables: country of origin, exporting firm identifier, country of destination, product, export value, and year. The raw customs data sets were subjected to uniform reformatting and to a series of cleaning procedures following those described in Fernandes et al. (2016). Firms are identified by their actual names, their tax identification number, or an artificial unique code randomly created by the local customs agency which allows us to create a panel of firms for each country. Regarding product nomenclatures, we use a concordance between product codes in the Harmonized Classification (HS) at the 6-digit level in the 2002, 2007, and 2012 versions (used in the raw customs data sets) and the 1996 version. Export values are Freight on Board (FOB) figures measured in USD converted from local currency to USD when necessary using exchange rates taken from the IMF’s International Financial Statistics.

Our analysis based on customs data focuses on exports of apparel products (HS chapters 61-63) to the US. Appendix Table E1 shows the number of exporters of apparel to the US in each year for each country.

Appendix Table D1. Number of exporters of apparel to the US per country and year

	Ethiopia	Kenya	Madagascar	Mauritius
2000				47
2001				54
2002				58
2003				58
2004				52
2005	14			49
2006	25	79		39
2007	27	50	58	40
2008	25	30	63	31
2009	27	26	49	30
2010	25	33	36	33
2011	22	43	18	38
2012	23	48	19	45
2013	28	43	19	46
2014	36	51	23	50
2015	40	46	29	35
2016	41	43	36	35
2017	44	59	31	

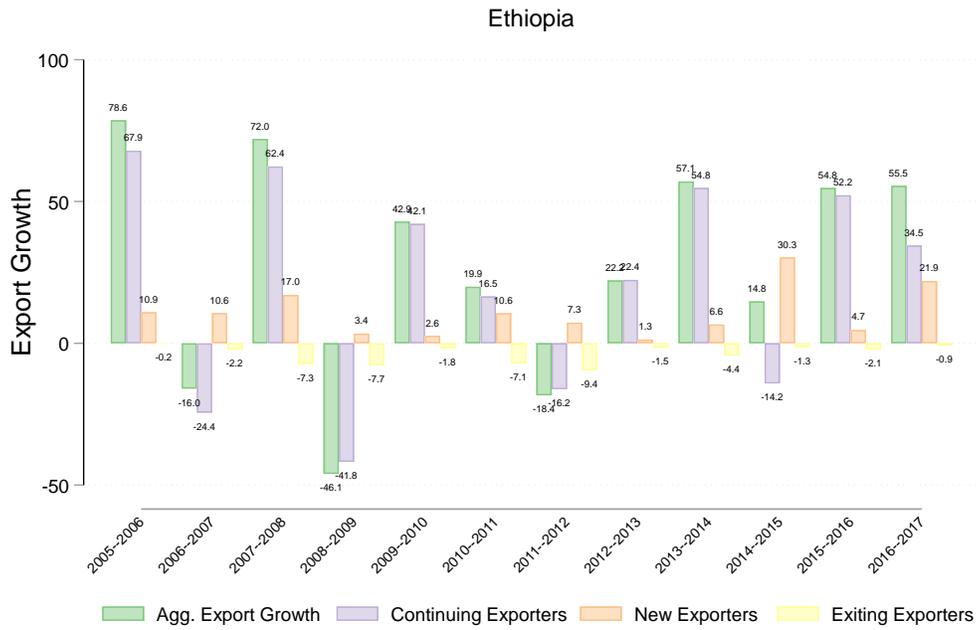
D2) Export growth decomposition formula and results

To understand the sources of aggregate growth, we decompose the change in each country's exports to the US between year $t-k$ and year t , ΔE_t into the change due to increases or decreases in exports at the existing exporting firms (i.e., intensive margin), the increase due to entry of new exporting firms, and the decrease due to the exit of existing exporters. The decomposition of export growth is as follows:

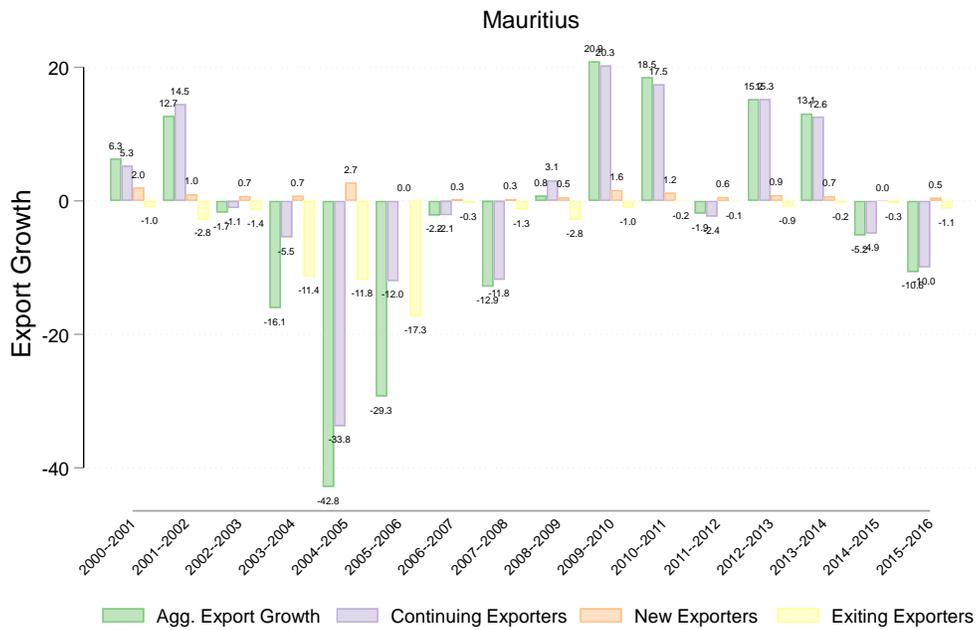
$$\Delta E_t = \sum_{j \in C} \Delta E_{jt} + \sum_{j \in E} E_{jt} - \sum_{j \in X} E_{jt-k}$$

where ΔE_t is the change in country's export between year $t-k$ and year t , C is the set of continuing exporters that are active in export markets in both $t-k$ and t , E is the set of entering exporters that are active in export markets in t but not in $t-k$, and X is the set of exiting exporters that are active in export markets in $t-k$ but not in t .

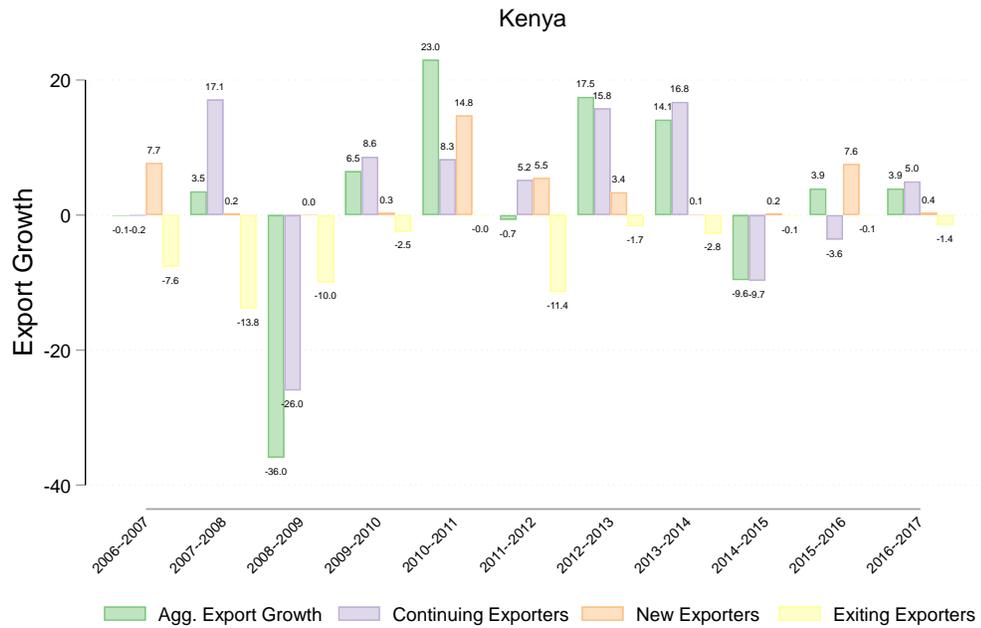
Appendix Figure D1. Apparel export growth (year-to-year) decomposition for Ethiopia



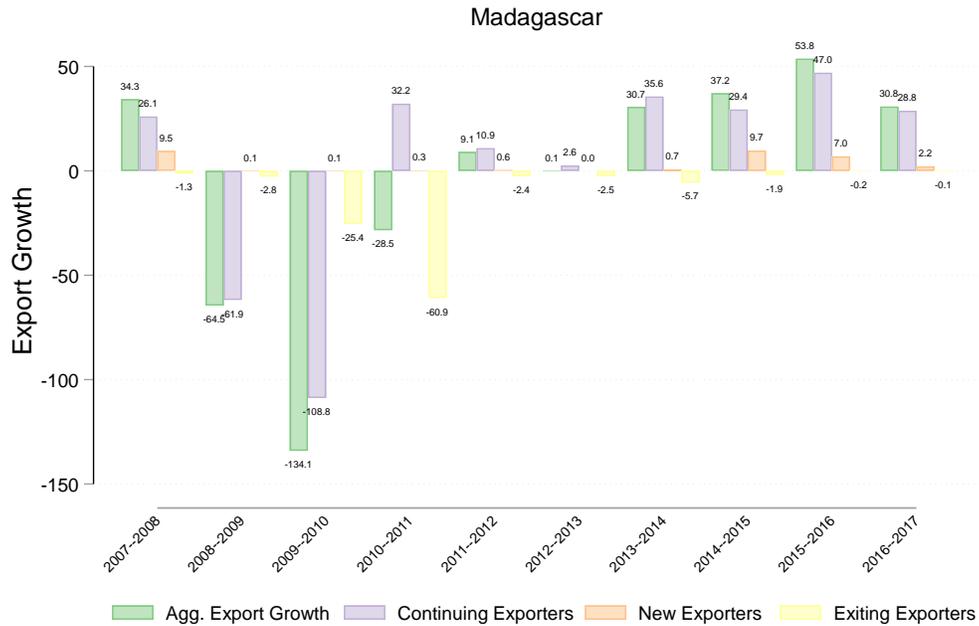
Appendix Figure D2. Apparel export growth (year-to-year) decomposition for Mauritius



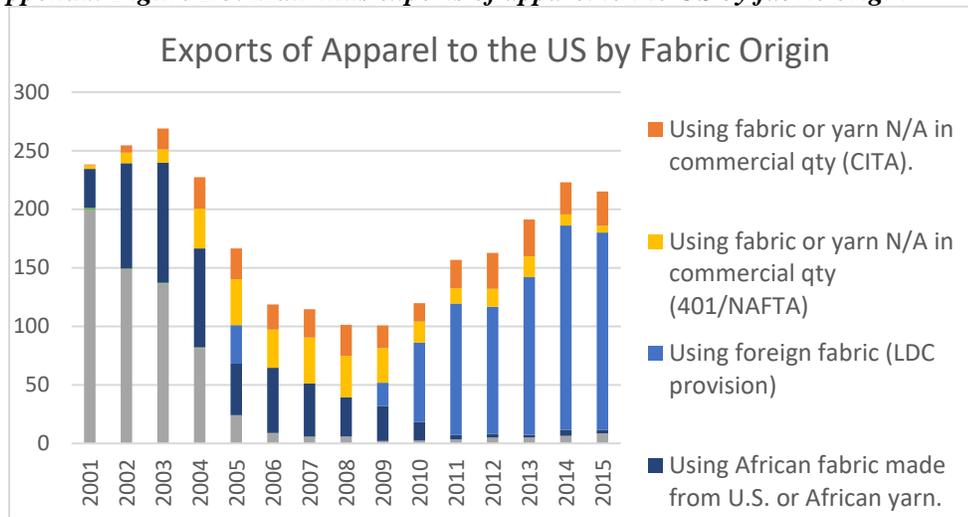
Appendix Figure D3. Apparel export growth (year-to-year) decomposition for Kenya



Appendix Figure D4. Apparel export growth (year-to-year) decomposition for Madagascar



Appendix Figure D5. Mauritius exports of apparel to the US by fabric origin



Source: USITC-OTEXA.

Note: Exports are classified by tariff regime eligibility and by fabric origin by product-country-year.

D3) Case study on Ethiopian apparel exporting firms: trade preferences or domestic policy reforms?

The raw country-product-year export data and the yearly impacts of AGOA clearly demonstrate that Ethiopia saw a late success in its apparel export growth to the United States. The effect of AGOA on apparel exports remains statistically significant after controlling for changes in exports to the European Union that occurred after AGOA came into force. To further verify that the boost in export to the US can be largely attributed to AGOA, we visited factories in Ethiopia and interviewed leading firms in the apparel sector. This section relies on information obtained from fieldwork in Ethiopia and testimonies of corporate executives.

Jay Jay Textile PLC was founded in 1971 in the Indian state of Tamil Nadu and operates production plants in Sri Lanka and Bangladesh. The company started its operation in Ethiopia in 2014 and began exporting to the US market in 2015. The main motivation to set up a factory in Ethiopia in 2014 was the establishment of the EPZ that addresses infrastructural challenges by providing land and factory sheds as well as electricity, water, and communication services. The decision was also motivated in part by the need to circumvent the high tariffs on apparel in the US market that were constraining clothing exports from its production plants in Sri Lanka and Bangladesh. “While Ethiopia’s workers have relatively low productivity levels compared to those in Sri Lanka and Bangladesh and inadequate trade logistics greatly affects the company’s cost, quality and lead times, the duty-free market access to the US market under AGOA significantly helped offset cost disadvantages due to the lower productivity of their workers and logistics costs.” While most Sub-Saharan African countries benefit from AGOA trade preferences, the company operation manager noted that the factors that set Ethiopia apart are the government’s pro-active industrial policy targeting the apparel and textile sector combined with the establishment of well-managed industrial parks. Countries like Mauritius have also developed infrastructure that can support a competitive apparel sector but have relatively high cost of labor. Hence, trainable inexpensive labor is another reason why the company was attracted to Ethiopia.

Jay Jay Textile PLC focuses primarily on apparel products for babies (newborns, infants and toddlers). Its production in its Ethiopian plant is entirely CMT (Cut-Make-Trim), sourcing all its materials from India (60 percent) and China (40 percent). The company sources materials from foreign markets for two reasons. First, the U.S. buyers determine where the materials should be produced and sourced from. Second, the quality of fabric and accessories produced in Ethiopia is not adequate for use in apparel exports to the U.S. market. Products produced by the company are mainly sold in the United States and only a small

share goes to the European market. There are two reasons behind this. First, the preference margin to the EU relative to the US is relatively small. The company can offer a more competitive price to EU buyers from its plants in Sri Lanka and Bangladesh since both countries have duty-free access in the EU under EBA. Second, European buyers order small quantities and diversified products. Producing differentiated products in smaller batches involves higher production costs, thereby making exporting to the US market relatively more profitable.

SHINTS ETP GARMENT PLC, which is headquartered in the Republic of Korea, established its production plant in Ethiopia in 2014 also. The company operates production plants in Vietnam and Ethiopia. The firm noted that the main reason to set up a factory in Ethiopia was the establishment of the EPZ which addresses the main infrastructural challenges. However, the company indicated that low labor productivity combined with inadequate trade logistics makes it difficult to compete in the US market, despite Ethiopia's cost advantage due to lower wages than in Vietnam. Compared to workers in Vietnam, the company indicates that Ethiopia's workers have low productivity due to low skill and high labor turnover. In addition, inadequate trade logistics greatly affects the company's cost, quality and lead times. However, the duty-free access to the US market under AGOA helped offset these cost disadvantages.

SHINTS ETP GARMENT PLC's production in Ethiopia focuses on less sophisticated large-run products on a CMT basis, with its production plant in Vietnam pursuing the more sophisticated activities. The firm relies entirely on imported materials from Asia (Vietnam, Thailand, China and Taiwan, China). The factory in Ethiopia depends on its headquarters in Korea to generate orders, design and send them fabric and accessories it needs. But it has a plan to build a vertically integrated plant in Ethiopia in the future.

NOVASTAR Garment PLC was established in 2006 by two Ethiopian diaspora (neither of whom had previous experience in the apparel sector). The factory is located outside of the EPZs. The company was established in response to the duty-free access to the US market granted under AGOA. While the decision to establish had been made in 2001, the year when AGOA came into force, actual production started only in 2006 when the construction of the production plant was finalized.

NOVASTAR company focuses primarily on sportswear made of polyester because AGOA trade preferences offer significantly larger duty savings for these products, which face higher U.S. import tariffs than do cotton products. While the US is the main market for the company's exports, it has also tried to expand its exports to the EU market but has struggled there for at least for two reasons. First, the company indicated that the EU does not offer the same benefits as the US since major low-cost Asian exporters such as Bangladesh are also benefiting from the preferential agreements with the EU. This indicates that not only the preference margins the country provides matter but also the availability (or lack thereof) of duty-free access by competitors. Second, stringent cost requirements by the European buyers also contribute to the favorability of the US market. The company managing partner indicates that they are not eager to expand their market due to supply-side constraints. As NOVASTAR is located outside the EPZs, it faces severe infrastructure challenges including unreliable and costly electricity; insufficient supplies of clean water; and poor road, rail, and port infrastructure. However, the company is not willing to relocate since that involves huge costs compared to the potential benefits.

PVH Corp began producing goods in Ethiopia in 2017 through a joint venture that it formed with Arvind Limited. AGOA renewal was a critical factor in PVH's decision to invest in Ethiopia (Mihretu, M. and Llobet, G., 2017). As the following testimony of William McRaith, the Chief Supply Chain Officer of PVH Corp, at the US senate committee hearing indicates AGOA renewal encouraged PVH to make long-term investments.

"Companies cannot commit to individual investments ranging in the hundreds of millions of dollars unless they have more certainty about the rules in place. We are embarking on these types of investment. However, it will take 12-24 months to set up very expensive yarn spinning, fabric weaving/knitting and apparel making facilities. We then need to train workers on the use of complicated machinery, build production capacity and be able to have benefits long enough to cover the full depreciation of our investments which takes in the ideal world 8 years...if we have any delays along the way, we will need the full 10-year period to recoup costs. The proposed ten-year AGOA extension is a strong signal showing that

Congress is working with the private sector in helping Africa develop and diversify into economic independence.”

Summary

While the establishment of EPZs has played an important role in Ethiopia’s apparel export boom, EPZs would likely not have been sufficient without the AGOA preferences, which played an important role in the emergence and growth of apparel exports from Ethiopia by offsetting the cost disadvantages resulting from lower labor productivity, higher logistics costs, and considerably longer lead times. If AGOA preferences did not exist, leading apparel companies would not set up their production plants in Ethiopia. AGOA has been in effect since 2001 but the fact that apparel exports surged only after the establishment of the EPZs suggests that tariff preferences alone were not sufficient to boost exports to the US market. Despite the impressive growth in export volumes, the export performance of Ethiopia has not been accompanied by dynamic benefits. Production is predominantly CMT, using fabric largely imported from Asia. The local production process is characterized by highly routine steps used to produce basic very large volume items. Most firms produce basic products (concentrating on a narrow range of garments). Producing differentiated products in smaller batches requires more skilled workers. Foreign factory owners are not closely integrated into the local community. Hence, the combination of a productivity disadvantage and a weak domestic upstream industry makes the Ethiopia apparel industry’s survival totally dependent on trade preferences. If these preferences disappeared, industrial expansion in the apparel export sector would collapse.

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