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Are trade preferences a panacea? The African growth and opportunity act and African exports

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Abstract

Does "infant industry" preferential access durably boost export performance? This paper exploits significant trade policy changes in the United States (US) to address this question. The expansion of Generalized System of Preferences (GSP) products for less developed countries in 1997 and the African Growth and Opportunity Act (AGOA) in 2001 are used to assess whether preferential access boosts exports of eligible products in general and apparel specifically. The end of the Multi-Fiber Arrangement (MFA) in 2005 is used to assess whether apparel export expansions survived the erosion of preferences. To find a causal impact of these changes, we use a triple-differences regression and 26 years of newly constructed trade and tariff data at the country-product-year level (1992-2017). The analysis finds that AGOA boosted African apparel exports and the GSP expansion increased African exports of other eligible products. While the marginal impacts on African apparel exports grew sharply in the first AGOA years, they leveled off after 2005, when the MFA end unleashed competition from Asian countries. The illusion of sustained African apparel exports is created by late-bloomers in East Africa offsetting boom-bust patterns in Southern Africa and insignificant responses in Central and West Africa. Firm-level customs data reveal that even in East Africa the recent export growth was driven by new entrants rather than incumbent firms whose competitiveness might have been nurtured by the big preference margins in the early AGOA period. Preferential access per se was not sufficient but needed to be complemented by specific domestic reforms: tariff liberalization, reduced regulatory burden, and enhanced connectivity.

JEL-Codes: F130, F140, F680, O200, O550.

Keywords: tariff preferences, Africa, AGOA, GSP, exports, MFA.

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1. Introduction

Economists do not agree on whether preferential access to foreign markets can help African countries. 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 markets. Moreover, protracted 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 US market under the African Growth and Opportunity Act (AGOA) spurred growth in African exports (e.g., Frazer and Van Biesebroeck, 2010). The latter view finds support in the experience of African countries with the Generalized System of Preferences (GSP) (e.g. Herz and Wagner, 2011).

There is surprisingly little evidence on the most 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. We address this question taking advantage of trade policy changes in the US at the turn of the century and of the passage of time relying on 26 years of highly disaggregated trade data. To place the policy changes in context, note that well before the entry into force of AGOA in 2001, nearly 30 percent of the Harmonized System (HS) 8-digit tariff lines in the US had zero MFN tariffs and another 35 percent were duty-free for LDCs under the 1970s GSP regime. The expansion of GSP products for LDCs in 1997 freed another 16 percent of 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, as part of a further 6 percent of tariff lines being made duty-free. That provided eligible African apparel exporters privileged access to the US market, not only because other countries continued paying tariffs but also because the main exporters were subject to quotas under the Multi-Fiber Arrangement (MFA).² 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 product expansion of 1997 (henceforth, “GSP LDC”) and the AGOA implementation of 2001 allow us to assess, as others have done, whether preferential access leads to an expansion of exports, for products in general and for apparel specifically. The MFA phase-out allows us to assess, in a way that has

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

² 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.

not been done before, whether any expansion in apparel exports persisted beyond the reduction in trade preferences.

The paper utilizes a highly detailed trade and tariff database that 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. While the descriptive analysis relies on product-level data at the 8-digit level, US import and tariff data are 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, resulting in a total of 27 million observations.

The raw data reveal that oil accounted for the bulk of African exports to the US under AGOA but we focus on manufacturing exports, since boosting manufacturing was the main purpose of AGOA. African manufacturing exports to the US grew steadily in the first post-AGOAs years and then flattened at about the time of the Great Recession. A more interesting pattern is seen in African apparel exports to the US, which first boomed, then declined after the end of the MFA quotas, and have stagnated in recent years. Delving deeper into apparel, we find that the aggregate picture for African exports is based on four different country-level stories: countries mostly in Central and West Africa never took meaningful advantage of AGOA; countries mostly in Southern Africa experienced a boom right after AGOA followed by a bust; countries like Lesotho and Mauritius experienced a period of growth and then stagnation; and countries in East Africa saw fairly sustained success, albeit starting late in some cases.

How far are these patterns attributable to GSP LDC, AGOA and the end of MFA? To identify a 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, proposed by Frazer and Van Biesebroeck (2010). The estimators identify the impact of GSP LDC or of AGOA from 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-AGOAs 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, as for the standard difference-in-differences, is differential pre-treatment dynamics. We could get spurious estimates of the GSP LDC and AGOA impacts 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, our preferred specification includes treatment group-specific time trends.

Our main findings are as follows. We first consider the average impact across all eligible products of all beneficiary countries 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. But the biggest boost from AGOA was to exports of apparel products, which benefitted from the largest tariff preferences. 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 trade creation aspects of AGOA outweigh the trade diversion aspects.

We then assess the average impact on apparel products and estimate a separate impact of AGOA for each year from 2001 onwards. The marginal impacts on apparel exports of all beneficiary countries exploded in the first years post-AGOA but then leveled off after the end of the MFA quotas on apparel in 2005. This flattening could be a consequence of the erosion of preferences for African countries facing fiercer competition from the Asian giants in the US market.

We also find that the impact of AGOA on apparel exports varied across the sub-regions in Africa. Central and Western Africa saw little growth in exports. Southern Africa displayed a significantly positive marginal benefit to exports in the first years which declined after the MFA was phased out. East African countries saw significant (in some cases, late) success, with large marginal impacts on exports from 2005 onwards.

These findings suggest that AGOA had a positive impact on African exports even after controlling for 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 was not sufficient for export growth - favorable domestic conditions were necessary to benefit from preferential access. Furthermore, beyond the sustained dynamism of Kenya, there is so far no evidence that preferential access nurtured longer term comparative advantage.

We also obtained customs transactions data for four representative African countries to study the firm-level dynamics underpinning the country-level results. In the case of Madagascar, the contraction after phase-out of the MFA was driven by the large-scale exit of firms which continued after the loss of AGOA privileges in 2009. In the case of Mauritius, firms did not exit but contracted their exports sharply until the relaxation of the AGOA rules of origin in 2009 prompted a revival. Most significantly, the sustained dynamism of Kenya and the late growth in Ethiopia were driven largely by new firms that entered the market after 2010 rather than those that had benefitted from big preference margins during the early AGOA period. Thus, in none of the countries do we see evidence of significant growth of exports by incumbent firms which had benefitted from prior preferential access and might have learned-by-doing and become internationally competitive.

An exploration of the causes of differential impacts of AGOA across African countries suggest three reasons. First, 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. Second, 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 but also the recent success of Ethiopia. But why the establishment of these zones helped in some countries and not in others requires a deeper investigation. Third, exchange rate regimes, and in particular overvalued real exchange rates, may help rationalize the lost opportunity for West Africa and other oil exporters.

The remainder of the paper proceeds as follows. Section 2 reviews the literature while Section 3 describes the data. Section 4 describes the trade preference regimes and Section 5 provides descriptive evidence on African trade patterns. Section 6 presents the econometric specification and Section 7 discusses the main results. Section 8 concludes.

2. Literature review

An extensive literature examines the impact of nonreciprocal trade preferences on developing countries' trade flows. With one exception, the existing research does not address the dynamic question we have identified as crucial, whether benefits are sustained in a post-preference environment.³ In what follows we briefly discuss a few key empirical studies which examine the impact of preferences using rigorous identification strategies drawing upon time-series and cross-sectional trade data.⁴ The literature that uses computable general equilibrium and other models to conduct ex ante simulations is less pertinent and not discussed here.

Most econometric studies rely on a gravity model - the standard tool in the literature to assess the effects of preferential trade agreements on trade flows (Head and Mayer, 2014) – to assess the impact of non-reciprocal trade preferences on bilateral trade flows. This literature typically uses a variable indicating whether preferences are in effect for a given country in a given year and generally finds a positive impact of preferences. Rose (2004) finds a strong positive and significant effect of GSP programs in fostering trade growth of developing countries over the 1948-1999 period (based on a sample of 178 countries). Shifting the period by a decade and considering all nonreciprocal preference agreements, Gil-Pareja, Llorca-Vivero and Martinez-Serrano (2014) show that those agreements, and GSP programs specifically, had a significant positive effect on exports of developing countries over the 1960-2008 period (based on a

³ This literature fits under the broader umbrella of the impact of preferential trade agreements on trade flows.

⁴ For a thorough review of the literature see Cirera and Cooke (2015). A detailed review of studies focusing on the impacts of AGOA is provided in USITC (2014).

sample of 177 countries). Cirera and Cooke (2015) conclude in their review of the literature that most gravity model-based studies find a positive impact of trade preferences on exports, though they differ in the magnitude of the impact and on the impact of specific nonreciprocal regimes. Using the quasi-experimental Synthetic Control Methods approach, Kassa and Coulibaly (2018) estimate the impacts of AGOA on each African country's total exports to the US over the 1993-2015 period. They show that most African countries exhibit gains in exports but the effects are heterogeneous across countries.

A couple of studies reach a less positive conclusion. Focusing on GSP programs and emphasizing dynamic impacts, Herz and Wagner (2011) show a positive short-run and negative long-run impact on exports of GSP beneficiary countries, using bilateral trade data for 184 countries over the period 1953-2006. They argue that the negative long-run impact may be due to distortions induced by the GSP program in the economic structure of beneficiary countries, attributable to administrative costs associated with technical compliance with GSP rules of origin. They conclude that GSP-type trade preferences are not an appropriate instrument to promote the economic development of low-income countries.⁵ However, their "short run" involves estimating their gravity regression using data for every year (thus exploiting year-to-year variation) and the "long run" involves estimating using only data every 5 years or every 10 years. They do not consider a post-preference scenario. Examining all nonreciprocal trade preference programs and data from 1950 onwards, Ornelas and Ritel (2018) show the average effectiveness of those programs across countries is ambiguous. However, allowing for heterogeneity across countries, nonreciprocal trade preferences have a strong positive impact on exports of LDCs but only when these countries are WTO members. They conclude that, for LDCs, nonreciprocal preferences complement the economic reforms required by WTO membership.

While yielding valuable insights on the broad impacts of nonreciprocal trade agreements, the studies mentioned above are subject to certain limitations. They are conducted at a high level of aggregation, estimating the impact on total bilateral export flows between countries of trade preferences captured as dichotomous variables, and thus rely on country-year variation that masks significant heterogeneity across products. Not all products are eligible for preferential treatment under trade agreements – a detailed discussion of this issue for GSP and AGOA will be provided in Section 4 – and preferential treatment of eligible products may differ based on the extent of the tariff cuts, the rules of origin, and the preference margin, all of which influence the degree of preference utilization. Given the difficulty of estimating the causal impact of preferential access on trade using aggregate data, it is difficult to attribute the positive trade outcome to preferential access.

⁵ Gil-Pareja et al. (2014), Herz and Wagner (2011), and Ornelas and Ritel (2018) obtain their robust findings using state-of-the-art gravity equation estimation that accounts for multilateral resistance terms, time-invariant and time-variant unobserved bilateral heterogeneity, as well as zero trade flows.

Methodologically, our paper is related to a small strand of the literature that attempts to estimate causal effects of nonreciprocal preferences using highly-disaggregated data and quasi-experimental difference-in-difference-types of specifications. In particular, our study follows the work by Frazer and Van Biesebroeck (2010) who provide an early evaluation of the trade impact of AGOA over the 1998-2006 period. They use highly disaggregated trade data at the country-product-year level and triple-differences specifications with treatment indicators identifying the countries and products benefitting from AGOA in each year (described in detail in Section 6). They show that AGOA caused an increase in African countries' exports to the US: a 28 percent increase on average across treated country-products when the sample includes oil exports and a more moderate impact of 6.6 percent when the sample excludes oil exports.⁶ They also show that the impact of AGOA grew over time over the 2001-2006 period. However, as the sample period ends in 2006, the paper assessed the impact of AGOA over a relatively short time horizon and could not assess whether the benefits survived the erosion of preferences. In addition, their analysis lumps together the impacts of the AGOA and GSP LDC programs for products that are eligible under both programs. We identify the effects of AGOA and GSP LDC separately.

A handful of studies have assessed the impact of the special provisions in AGOA for textile and apparel articles, but to our knowledge all focus on early impacts, up to 2008 at the latest. Nevertheless, two studies anticipate some of the concerns we raise. Edwards and Lawrence (2010) build a theoretical model to assess whether the apparel provisions under AGOA led to a sustained effect. 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 provisions did not encourage significant local value-addition. Using product-level data for the 1996-2008 period, Rotunno, Vézina, and Wang (2013) study the role of the MFA quota regime still in place in the first years post-AGOA in explaining exports of apparel products from AGOA countries.⁷ They find that the least developed AGOA countries that benefitted from the simplified rules of origin (single transformation) enjoyed rapid growth in their apparel exports in the years after AGOA was introduced and substantial declines following the end of the MFA quota system in 2005. They find a significant correlation between these countries' exports of apparel to the US and these countries' imports from China of apparel products subject to quotas in the US. They conclude that since the least developed AGOA countries were not subject to restrictive rules of origin, they could directly import apparel from China and transship it duty-free to the US without any value addition. Our paper differs from theirs in at least two dimensions. First, while their paper considers the effect on eligible apparel products across AGOA-eligible countries, our sample includes all HS 6-digit

⁶ USITC (2014) documents the importance of oil exports as beneficiaries of AGOA, a fact that was probably not anticipated nor desired by US policy makers extending special treatment to African countries to help them grow and develop their industrial sectors.

⁷ Brambilla, Khandelwal, and Schott (2009) describe the MFA quota regime and exploit the constraints of China under the regime and its export surge when the regime ended.

products and all countries exporting to the US. In particular, we estimate a triple-differences model that compares all products that are eligible with ineligible products (first difference) before and after the implementation of the nonreciprocal preferences (second difference) and across exporting countries – eligible and non-eligible (third difference). In addition, since our sample extends beyond 2008, we can study the long-term impact of preferential access and the end of the MFA.

Finally, there are some studies that have compared the impact of AGOA with that of the preferential access granted to least developed countries under the European Union’s Everything But Arms (EBA) initiative. Collier and Venables (2007) estimate the relative impact of the two initiatives using the equivalent of a triple-differences specification for the period 1991-2005, in which they compare middle-income and developing countries’ exports of apparel to the US and the EU. They show that AGOA textiles and apparel provisions have a significant impact on African exports of apparel to the US whereas EBA’s impact is insignificant. De Melo and Portugal-Perez (2013) exploit the difference in rules of origin for apparel between AGOA and EBA – i.e., the fact that under AGOA, 22 African countries could use fabric of any origin (single transformation) and meet the criterion for preferential access in the US (the so-called Special Rule that we discuss in Section 4) whereas the EU required yarn to be woven into fabric and then made into apparel in the same country (double transformation). Their panel estimates for the 1996-2004 period show that the simplification in rules of origin under AGOA which took place around 2002 contributed to a substantial increase in exports of apparel to the US (by approximately 168 percent for the top seven beneficiary countries) that was four times as large as the growth effect from the initial preferential access under the AGOA. We conjecture that the restrictiveness of rules of origin may have implications not just for the impact of preferences but also for whether the impact is sustained when preferences decline. For example, restrictive rules of origin may limit preference utilization but, by inducing greater local value added, lead to greater learning-by-doing and more sustainable results. Unfortunately, it is not possible to test this conjecture rigorously in the AGOA context because almost all African countries were allowed access under identical liberal rules of origin.

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 (USITC). This section provides a brief description of this database (the US Trade and Market Access Database, USTMAD) and we direct the reader to the companion note for all details.⁸

⁸ The companion note (and the database) is available at: <https://datacatalog.worldbank.org/node/144174/revisions/365082/view>.

The database provides detailed information on tariffs and product-eligibility for trade preferences in the US, including the applied most favored nation (MFN) tariff the country-product faces in the US in a particular year, the unilateral preferences the country-product can benefit from in the US in that year (e.g., GSP, AGOA), and the best preferential tariffs that the country-product can benefit from in the US in that year. Our tariff measures are all expressed as ad-valorem, as we compute ad-valorem equivalents for duty variables expressed in the USITC tariff database as specific tariffs or combined tariffs (with an ad-valorem component and a specific component).⁹ The database also includes the value and quantity of US imports from any country of any HS 8-digit product in each year during the period 1997-2017.

The new US trade and market access database offers important advantages relative to the widely used trade and tariff data sets from the World Trade Integration Solution (WITS). First, it provides information at a more disaggregated level 8-digit level. Second, it provides much better coverage in terms of years for all types of tariffs, be it the MFN or preferential tariffs (under a large number of programs and regimes) whereas the WITS data on tariffs have many MFN and preferential tariffs missing. Imputation techniques used in the literature to correct those missing tariff data may yield inaccurate tariff rates. Third, preferential tariff rates are constructed based on updated preferential trade agreements, whereas in the WITS data they are often not updated when the preferential rates are phased in and phased out. Finally, it includes information on the actual imports which have entered under different trade regimes (for example GSP and AGOA) such that preference utilization rates can be computed. However, note that in Section 5 we will provide some broad patterns on African export performance to the world (not just the US) using WITS data.

For the econometric analysis, we make the following adjustments to the database. First, in order to capture trade flows before the GSP product coverage is expanded for LDCs in 1997, we augment the import data to include years from 1992 onwards. Second, for computational feasibility, trade, preference eligibility, and tariff data are aggregated from 8-digit level to the 6-digit level for most of the estimation. Third, in order to account for zero trade flows in our estimation, 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, many recording zero trade flows. Fourth, we exclude from the estimating sample in all regressions, oil products (HS chapter 27), although they account for a large share of AGOA-eligible exports from African countries to the US, as our study focuses on the impact of US trade preferences on African manufacturing products. Our long sample period presents a challenge regarding the product classification as HS product codes underwent several revisions between 1992 and 2017. To harmonize product codes across years, we convert

⁹ The ad-valorem equivalents are obtained by dividing the specific tariff (or specific component) by the import unit price, itself computed as the median of the unit values of all US imports of a given HS 8-digit product in a given year across partner countries, from the US Census trade data.

all HS 6-digit level codes into HS 1996 revision 6-digit codes using the concordance tables provided by WITS.

The detailed tariff information allows us to examine how the trade effects of preferences under AGOA or GSP LDC vary with the magnitude of the preference margin offered to these beneficiary countries and how this effect changes over time. The database also provides detailed tariff information to examine how the trade effects of AGOA or GSP LDC change in response to the reciprocal and non-reciprocal preferential tariff rates granted to other countries.

One limitation of the tariff information is that it does not capture the ad-valorem equivalents of quotas such as those on apparel exports implemented under the Multi-Fiber Agreement (MFA). To account for the effects of the end of the MFA in our analysis, we complement the tariff data using quota information for years 1992-2004 from Brambilla, Khandelwal, and Schott (2010). They construct quota fill rates in the US by exporting country and year for 3-digit MFA categories defined by OTEXA that are mapped to 10-digit US HS codes using a concordance.¹⁰

4. Trade preferences in the US: GSP and AGOA

Over the last half century, developed countries have aimed to support the integration of developing countries into the world economy by providing them with ‘special and differential treatment,’ including non-reciprocal preferential access to their markets. A key instrument for such trade preferences has been the Generalized System of Preferences (GSP).¹¹ GSP programs were established under the assumption that preferential market access to developed country markets – in the form of duty-free status or lower tariff rates for a wide range of products – could spur export-driven growth in developing countries. The argument was that the markets of developed countries were sufficiently large to provide economic motivation and space for developing countries to achieve those goals.

The European Union was the first to establish a GSP program for developing countries since the early 1970s and other developed countries followed, with the US beginning its GSP program for beneficiary developing countries (BDCs) in 1975.¹² In 1997, the scope of the US GSP benefits was expanded for least-developed beneficiary developing countries (LDBDCs) by allowing duty-free entry in the US for a larger number of products. To be eligible for GSP, countries must *not* be classified as “high income” by the World Bank.¹³ Eligibility for GSP LDC is determined by the United Nations based on three criteria: per capita

¹⁰ The quota information is available at http://faculty.som.yale.edu/peterschott/sub_international.htm.

¹¹ See Ornelas (2016) for an extensive discussion on ‘special and differential treatment’ and GSP preferences.

¹² Under GSP, each preference-granting country establishes specific criteria and conditions for defining and identifying developing countries’ beneficiaries.

¹³ GSP beneficiary countries lose their beneficiary status after the US President determines they have become “high-income” countries.

gross national income (GNI), human assets, and economic vulnerability to external shocks.¹⁴ In addition to GSP programs, the EU and the US signed other non-reciprocal preferential trade agreements with developing countries, such as, respectively, the Everything but Arms (EBA) and the African Growth and Opportunity Act (AGOA).

AGOA was signed into law in May 2000, as part of the Trade and Development Act of 2000 under the broad US “trade not aid” economic doctrine towards Sub-Saharan Africa.¹⁵ AGOA defined Sub-Saharan Africa to include 49 countries (South Sudan was added in 2012) and authorized the US President to designate an SSA country as beneficiary if it met the eligibility requirements set forth by the authorizing legislation. AGOA granted certain unilateral trade preferences to the eligible countries: an extension of benefits under the US GSP program (whether the countries are LDCs according to GSP’s definition or not) and duty-free treatment for certain textile and apparel articles excluded from duty-free treatment under GSP. The latter were granted through two provisions: the general AGOA textile and apparel provisions (section 112) and the ‘special rule’ for less-developed countries, also known as ‘third-country fabric provision.’ These unilateral trade preferences are described in further detail below.

There is an annual review (and a report to the US Congress) of the current and potential eligibility of each of the 49 SSA countries to be designated as AGOA beneficiaries. The number of SSA countries eligible for AGOA preferences has changed over time, starting at 34 in 2001 and increasing to 49 in 2017. Appendix Table 1 shows AGOA eligibility for each SSA country and year. Over the 2001-2017 period some countries lost AGOA eligibility (with some later regaining it) due to violations in eligibility conditions related to political violence, problems with the rule of law, and human rights abuses.¹⁶

SSA countries eligible for AGOA preferences do not automatically qualify as eligible for preferences under the general textile and apparel provisions. USITC (2014) indicates that to be eligible for preferences under the general textile and apparel provisions (section 112), AGOA beneficiary countries need to be certified to have in place an effective visa system, enforcement and verification procedures. These conditions ensure that the goods on which AGOA benefits are claimed are in fact produced in an eligible SSA country, meeting the rules of origin required to claim those benefits. As of 2017, 26 AGOA beneficiary countries also qualify for the general AGOA textile and apparel provisions, as seen in Appendix Table 1. Burundi, Togo, and South Sudan, among others, did not qualify.

AGOA-eligible countries designated as lesser developed beneficiary countries (LDBC) – defined as those with a per capita gross national product (GNP) lower than \$1,500 in 1998 – qualify for additional preferential treatment under the AGOA ‘special rule.’ Under these rules, yarn, thread or fabric used in

¹⁴ See <http://unohrlls.org/about-ldcs/criteria-for-ldcs/>.

¹⁵ The description of AGOA rules draws heavily on Chapter 1 in USITC (2014).

¹⁶ See USITC (2014) for further details on countries’ eligibility criteria.

manufacturing of textile and apparel articles can be sourced in any country in the world, and those articles can be eligible for duty-free access in the US, subject to certain quantitative restrictions.¹⁷ Although Botswana, Namibia, and Mauritius are not LDBC according to the per capita GNP definition, amendments to AGOA designated them as LDBCs from 2004 onwards.¹⁸ Appendix Table 1 shows that 24 AGOA beneficiary countries also qualify for the AGOA ‘special rule’ as of 2017.

South Africa is the only SSA country eligible for preferences under the general textile and apparel provisions but not eligible for the ‘special rule’ since it is not designated as a LDBC. For South Africa, the rules of origin 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.¹⁹

Rules of origin are different for non-apparel products from those applied to textile and apparel articles and are similar for all AGOA-eligible countries resembling those of the GSP program. Duty-free treatment for imports to 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, as well as the cost of materials and parts sourced from the US (that can account for up to 15 percentage points of that 35 percent).

Over the 1997-2017 period, there was some degree of uncertainty about the continuity of both US GSP and AGOA due to periodic expirations, and in the case of AGOA there were also amendments and changes. One such change was the addition to the list of LDBCs benefitting from the ‘special rule’ (three countries that did not fit the LDBC per capita GNP definition in 2006 and 2008).²⁰ In 2004, AGOA benefits were extended until 2015 but the ‘special rule’ was extended only until 2007. Then, the ‘special rule’ was renewed under a series of waivers in 2006 and extended until 2012, and in 2012 it was extended until 2015. In 2015, AGOA (including the ‘special rule’) was re-authorized to be in place until 2025.

Next, we discuss product eligibility under GSP and the changes brought by AGOA, drawing on the US database on trade and market access. Table 1 presents the numbers separately for African LDCs and non-LDCs. For both LDCs and non-LDCs, before AGOA was enacted, from the universe of 10,184 tariff lines (HS 8-digit) on US imports, 3,131 faced a non-preferential (MFN) zero rate of duty in the US while

¹⁷ In practice, USITC (2014) reports that these quantitative restrictions were never binding since the onset of AGOA. The ‘special rule’ implies that rules of origin for eligible countries are a single transformation requirement, that is, the only requirement is that the transformation from fabric to garment is undertaken in the eligible country.

¹⁸ Mauritius’ treatment as LDBC was temporary between 2004 and 2005 and was not renewed in 2006, but was granted again in 2008 without a fixed term.

¹⁹ Additional rules govern the inclusion of interlinings, findings and trimmings of foreign origin (up to 25% in value is allowed) and other minimal fabrics (up to 10% in weight).

²⁰ Hakobyan (2015) finds that the temporary expiration of GSP preferences in 2011 had a negative impact on exports despite the tariffs being refunded after reauthorization.

3,507 faced a zero rate of duty in the US for GSP eligible countries.²¹ For LDCs, 1,670 tariff lines were added to the duty-free group under the expansion of the GSP LDC program in 1997 and from 2001 onwards, 780 new product lines became eligible for duty-free entry under AGOA, divided into 555 apparel tariff lines, which had never been duty-free under any other non-reciprocal trade preference regime before AGOA, and 225 non-apparel tariff lines that faced positive MFN tariffs prior to AGOA. For non-LDCs, from 2001 onwards, 1,610 tariff lines that were already duty-free under GSP LDC since 1997, became duty-free under AGOA and, (similarly to LDCs) 780 new product lines – 555 apparel and 225 non-apparel – became eligible for duty-free entry under AGOA. The significance of AGOA seems larger when accounting for the value of SSA exports in eligible tariff lines. For SSA LDCs, AGOA covers 11 percent of exports in 2001, mostly accounted for by apparel products. For SSA Non-LDCs, AGOA covers 67 percent of exports of which 3 percent are of AGOA-exclusive products, mostly apparel, and 64 percent are due to the extension of GSP LDC to all SSA countries. For LDCs 1,096 tariff lines remain dutiable in the US post-AGO, while for non-LDCs 1,156 tariff lines remain dutiable in the US.²²

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

	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%	
AGO Apparel	555	555	11%	3%
AGO Non-LDC		1,610		64%
AGO Only	225	225	0%	0%
No Preference (MFN>0)	1,096	1,156	0%	1%
Total	10,184	10,184	100%	100%

Note: the number of tariff lines and total exports are for 2001. 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).

The tariff structure presented in Table 1 shows that for AGOA-eligible countries in the US market, the bulk of tariff lines are duty-free. Focusing on LDCs, of the 1,096 tariff lines that have no preference and positive MFN tariffs, textiles (HS 50-60) account for 753 tariff lines, textile-products other than apparel for 85, and the other most important categories are dairy produce, bird eggs, etc. (81), sugars and confectionary (24), cocoa and preparations (38), miscellaneous edible preparations (29), and travel goods (15).

²¹ To be more precise, the MFN zero rate of duty was applicable to any country with normal trade relations with the US. Some exclusions to this rule were Vietnam until 2001. Currently only Cuba and the Democratic People's Republic of Korea do not have normal trade relations with the US.

²² The difference is explained by 60 tariff lines of the 1,670 that became duty-free under the GSP LDC program in 1997 and were not extended to non-LDC SSA countries after AGOA.

In addition to product eligibility under AGOA, it is important also to document the actual tariff preference that the regime awarded to African exports to the US. Considering averages across all products, Panel A of Figure 1 shows that the average tariff had already been reduced from the average MFN tariff of 5 percent to less than 4 percent for GSP-eligible countries and to less than 3 percent for GSP LDC-eligible countries. AGOA brought the simple average tariff down to between 1 and 2 percent from 2001 onwards for all eligible countries. This impact was particularly large for non-LDC SSA countries for which the AGOA non-LDC product list (almost all GSP-LDC) and the AGOA-only products were liberalized simultaneously in 2001.

The trade-weighted average tariff, which accounts for the actual export capacity of African countries, was much lower than the simple average even prior to AGOA, but declined further with AGOA, more sharply than as a result of GSP and GSP LDC programs. GSP covered products with small exports while GSP LDC covered important products such as oil exported by several African countries (e.g., Angola) but AGOA was the reason for the reduction of the average to zero, due to its expansion to all SSA countries (e.g., Nigeria) and to its coverage of apparel products.

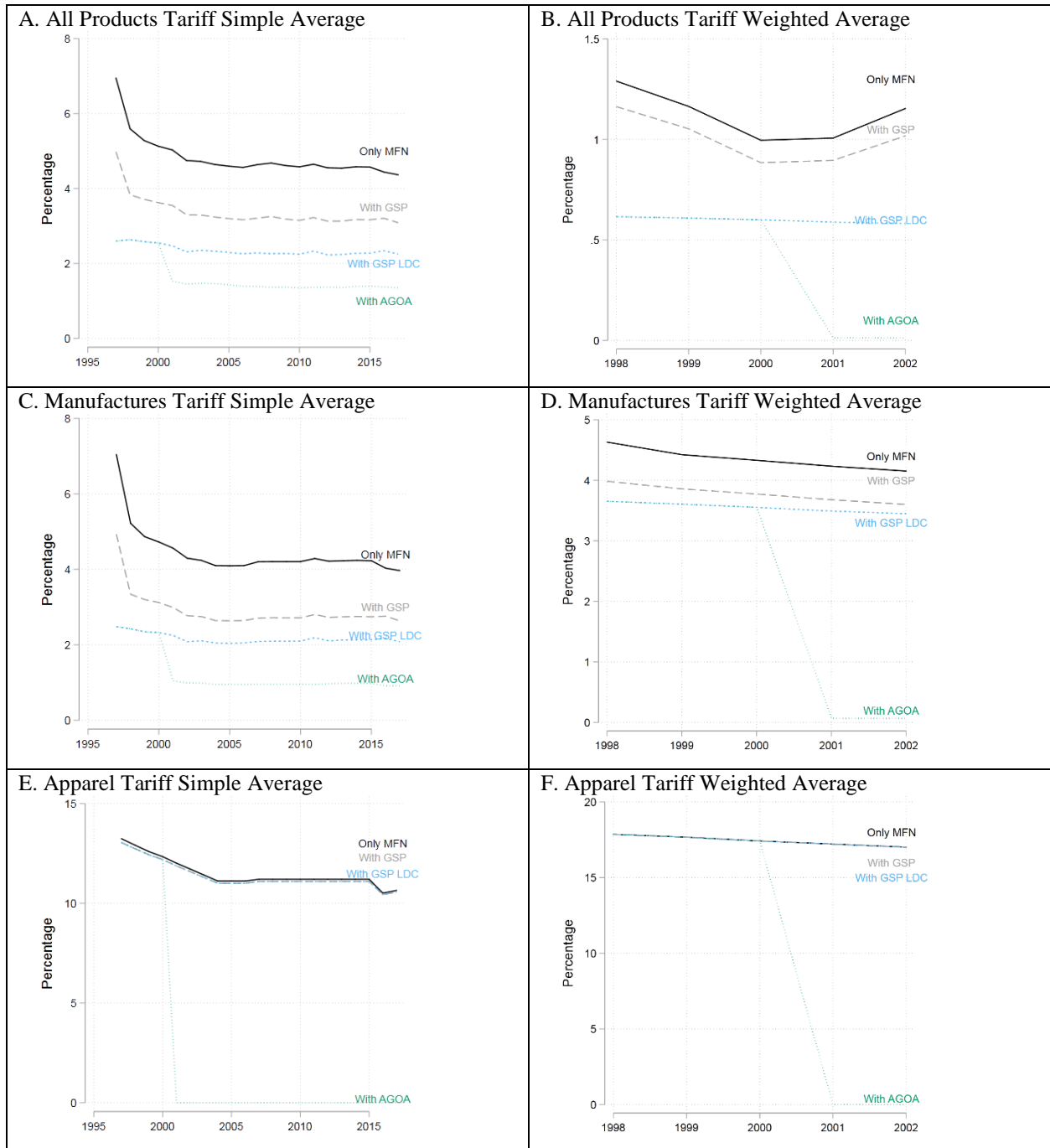
Panel B shows that the impact of AGOA on the simple average tariff on manufacturing products was similar in magnitude to that across all products but was much higher on the trade-weighted average tariff on manufacturing products. The reason is because the corresponding trade-weighted average MFN tariff was much higher (above 4.5 percent) than across all products combined, and because GSP and GSP LDC duty-free treatment covered products with seemingly little export capacity in SSA. AGOA slashed the trade-weighted average tariff on manufacturing products to almost zero, because it covered manufacturing products in which African countries had the greatest export capacity.

But the most crucial tariff cuts induced by AGOA were on apparel products, as shown in Panel C, because these were the products most protected by US MFN tariffs of about 12 percent and because AGOA duty-free treatment was extended to every single apparel product in HS chapters 61-62. GSP and GSP LDC had almost no effect on average tariffs because those preference programs do not cover apparel (other than a few accessories). The impact of AGOA is magnified for the trade-weighted average that is brought to zero, relative to a trade-weighted MFN rate of 17 percent.

Appendix Figures C1 and C2 show the impact of AGOA on the average tariffs on agricultural products and on mining products. AGOA added few agricultural products to those already duty-free under GSP LDC. As such AGOA duty-free treatment was important only in reducing tariffs for non-LDC African countries that export agricultural products, like Côte d' Ivoire and Kenya. Average tariffs for mining were small due to low MFN tariffs and to GSP preferences. The most important African mining exports to the

US already faced MFN tariffs close to zero prior to AGOA. AGOA duty-free treatment became important for non-LDC mining-intensive countries such as Botswana, Namibia, Nigeria, and South Africa.

Figure 1. Impact of AGOA on US average tariffs on all products for Africa



Source: US database on trade and market access.

Note: simple average tariffs include all 8-digit tariff lines of the US Trade Schedule (HTS) for each year. Ad-valorem equivalents are calculated for tariffs with specific components (149 tariff lines with complex tariffs are not included). Trade-weighted average tariffs use total SSA exports to the US in 2000 as weights. Number of products per sector in the 2001 HTS. Apparel includes HS sections 61 and 62.

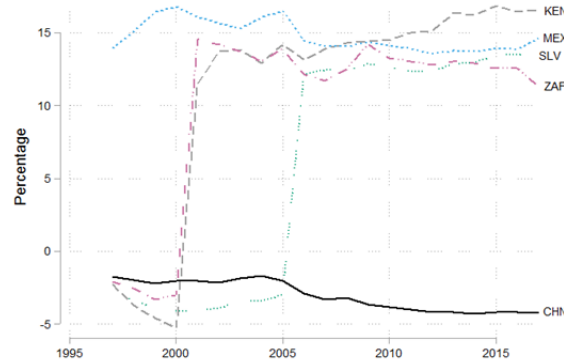
Due to the proliferation of preferential trade agreements over the last two decades between the US and non-African trading partners, the MFN tariff rates used in Figure 1 are an imperfect benchmark against which to measure the tariff advantage that a preference program like AGOA provided in the US market. It is therefore useful to consider a measure that captures the benefits of duty-free treatment provided by AGOA to African countries relative to the preferential treatment provided by the US to other exporting countries. We construct a competition-adjusted relative preference margin (RPM), simplifying the formula used by Nicita (2011) as:²³

$$RPM_j^{US} = \frac{\sum_{hs} X_{j,hs}^{US} \left(\frac{\sum_V X_{v,hs}^{US} t_{US,hs}^v}{\sum_V X_{v,hs}^{USA}} - t_{US,hs}^j \right)}{\sum_{hs} X_{j,hs}^{US}} \quad (1)$$

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. For a given country, the RPM measures the difference between the trade-weighted average tariff paid by all other competing countries and the trade-weighted average tariff it pays, with a higher RPM indicating that it benefits from a higher preference. To illustrate this, we construct RPMs for apparel (HS 8-digit products within chapters 61-62) for China, Mexico (capturing NAFTA), El Salvador (capturing CAFTA), and Kenya and South Africa (capturing AGOA) and show them in Figure 2. AGOA resulted in a large (competition-adjusted) preferential margin in apparel for SSA countries. In fact, AGOA gave African countries the same preferential margins as NAFTA gave Mexico. The RPM received by Kenya and South Africa from AGOA is robust to the Central American preferential treatment that started in 2005. 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.

²³ The simplification we implement relative to Nicita (2011) is that we do not consider trade elasticities in the calculation, thus assuming that all countries' export flows react similarly to a reduction in tariffs.

Figure 2. Relative preferential margins in apparel – selected countries



Source: US database on trade and market access.

5. Descriptive evidence: African export performance and the role of AGOA

In this section, we first describe broad patterns of Africa’s export performance and then link it to AGOA.

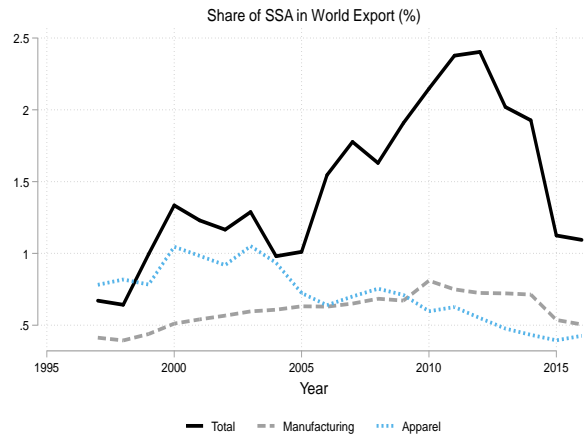
5.1 African export performance

In describing Africa’s export performance over the last two decades, we focus on African countries’ share in world trade, the sectoral composition of their exports, emphasizing manufacturing and apparel, and the share of different destination countries, using data from WITS.²⁴

The low share of Africa in world exports (the solid line in Figure 3) increased from about 0.6 percent in 1997 to almost 2.5 percent in 2011, and then declined abruptly to 1 percent by 2017. Since African exports are intensive in commodities, the value of African exports is sensitive to commodity prices, and growth of African total exports follows closely growth of commodity prices (Appendix Figure B.1). The share of SSA in world exports of manufacturing is much less sensitive to swings in commodity prices and has remained mostly unchanged over the last two decades, at a low 0.5 percent. However, the share of SSA in world exports of apparel was cut in half from about 1 percent in 2000 to less than 0.5 percent in 2017.

²⁴ The definition of manufacturing used in our analysis is provided in Appendix B which also provides some information on the availability (or lack thereof) of WITS data for SSA countries.

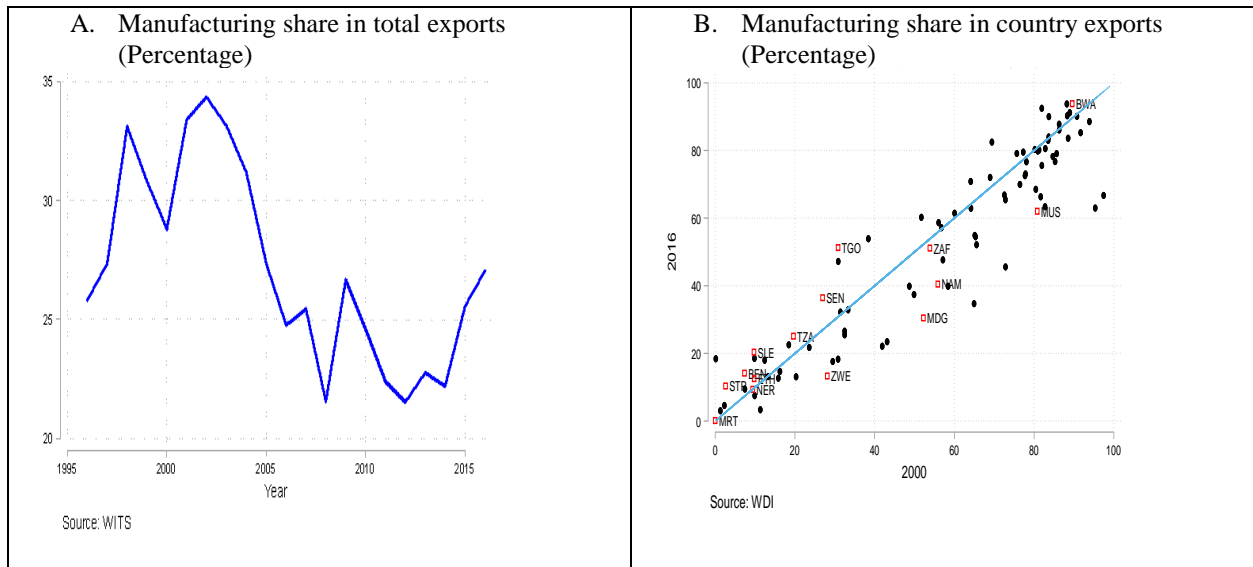
Figure 3. Sub-Saharan Africa share of exports



Source: WITS.

The share of manufacturing in *total African exports* was close to 30 percent at the beginning of the twenty-first century, but decreased thereafter due to the boom in commodity prices until the global financial crisis in 2008, and then increased from 2012 onwards reaching 27 percent by 2016 (Figure 4.A). Individual countries exhibit diverse patterns, with manufacturing accounting for a high share of total exports for Botswana, South Africa, Madagascar and Namibia (Figure 4.B). Importantly, except for Senegal and Togo, none of the other African countries exhibits a meaningful increase in the share that manufacturing represents in their total exports between 2000 and 2016.

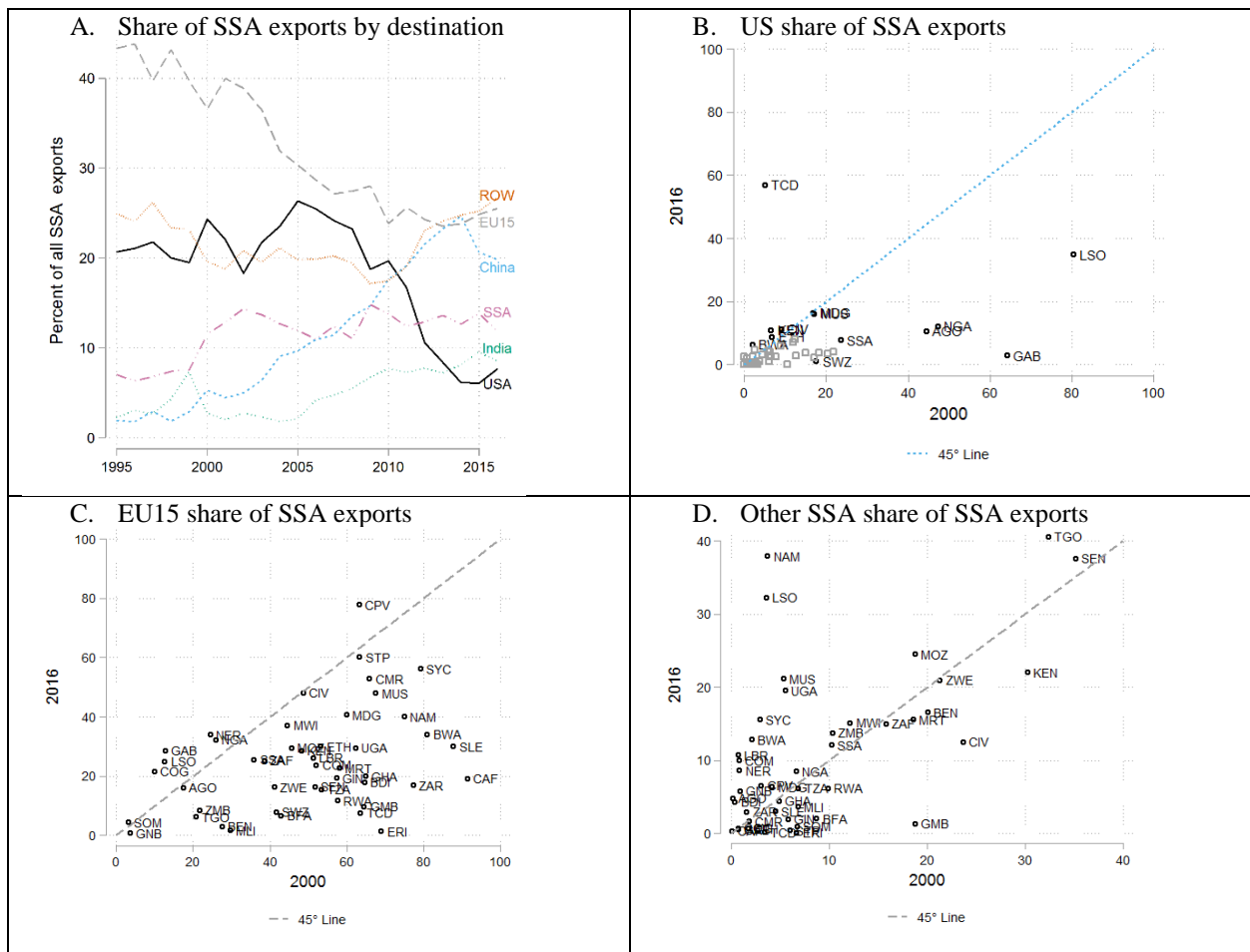
Figure 4. Manufacturing as a share of SSA total exports and SSA countries' total exports



Note: In panel B the sample includes countries in all regions but only the observations pertaining to African countries are labelled.

Africa is shifting away from its traditional trading partners, the US and the EU15, and increasing its exports to China and India (Figure 5.A). For most SSA countries, the US is a relatively small destination for exports and its share declined between 2000 and 2016 (Figure 5.B).²⁵ Similarly, for almost all SSA countries, the share of their total exports going to the EU15 declined over the period: for most it was higher than 40 percent in 2000 and for most it was less than 40 percent in 2016 (Figure 5.C). The share of other SSA countries as a destination for SSA countries' exports remained relatively small and stable for most countries, but increased substantially over the 2000-2016 period for countries like Namibia and Lesotho (Figure 5.D).

Figure 5. SSA total exports and SSA countries' total exports by destination



Source: WITS.

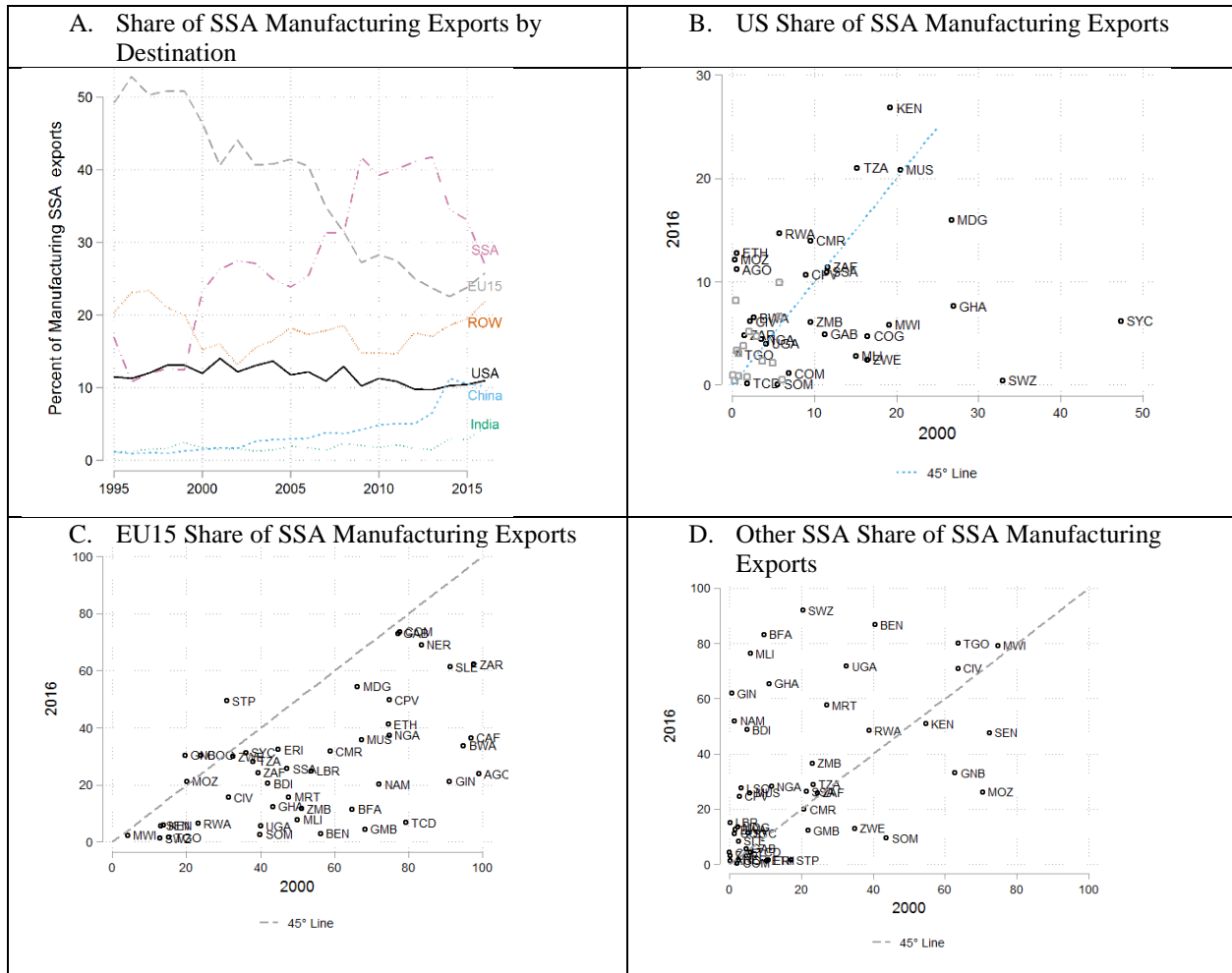
²⁵ The US was an important destination as of 2000 for total exports of less than a handful of countries: Lesotho, Angola, Gabon, and Nigeria.

Africa's manufacturing exports, like its aggregate exports, have shifted away from the EU15, whose share as a destination declined from 50 percent in 1995 to 25 percent in 2015 (Figure 6.A). In contrast, the share of SSA manufacturing exports going to the US remained stable at around 10 percent. The share of manufacturing in SSA exports going to China and India is substantially lower than in SSA total exports, indicative of the recent pattern of Africa being a supplier of raw materials to those fast-growing destinations. The share of SSA manufacturing exports to other SSA countries increased substantially from 10 percent in 1996 to 40 percent in 2010, and but then declined to 30 percent in 2016.

The shares of manufacturing exports going to the US are lower than 30 percent for most SSA countries. Between 2000 and 2016, the changes in those shares were different for individual countries, with the US gaining importance for Kenya, Tanzania and Rwanda but losing importance for the Seychelles and Eswatini (Figure 6.B).²⁶ The changes in shares of manufacturing exports going to the EU15 were more uniform, decreasing in almost all countries between 2000 and 2016 (Figure 6.C). Increases in the shares of manufacturing exports going to other SSA countries were observed for many countries such as Eswatini, Mali, Uganda, and Namibia (Figure 6.D).

²⁶ Eswatini is the name of the country formerly known as Swaziland.

Figure 6. SSA manufacturing exports and SSA countries' manufacturing exports by destination

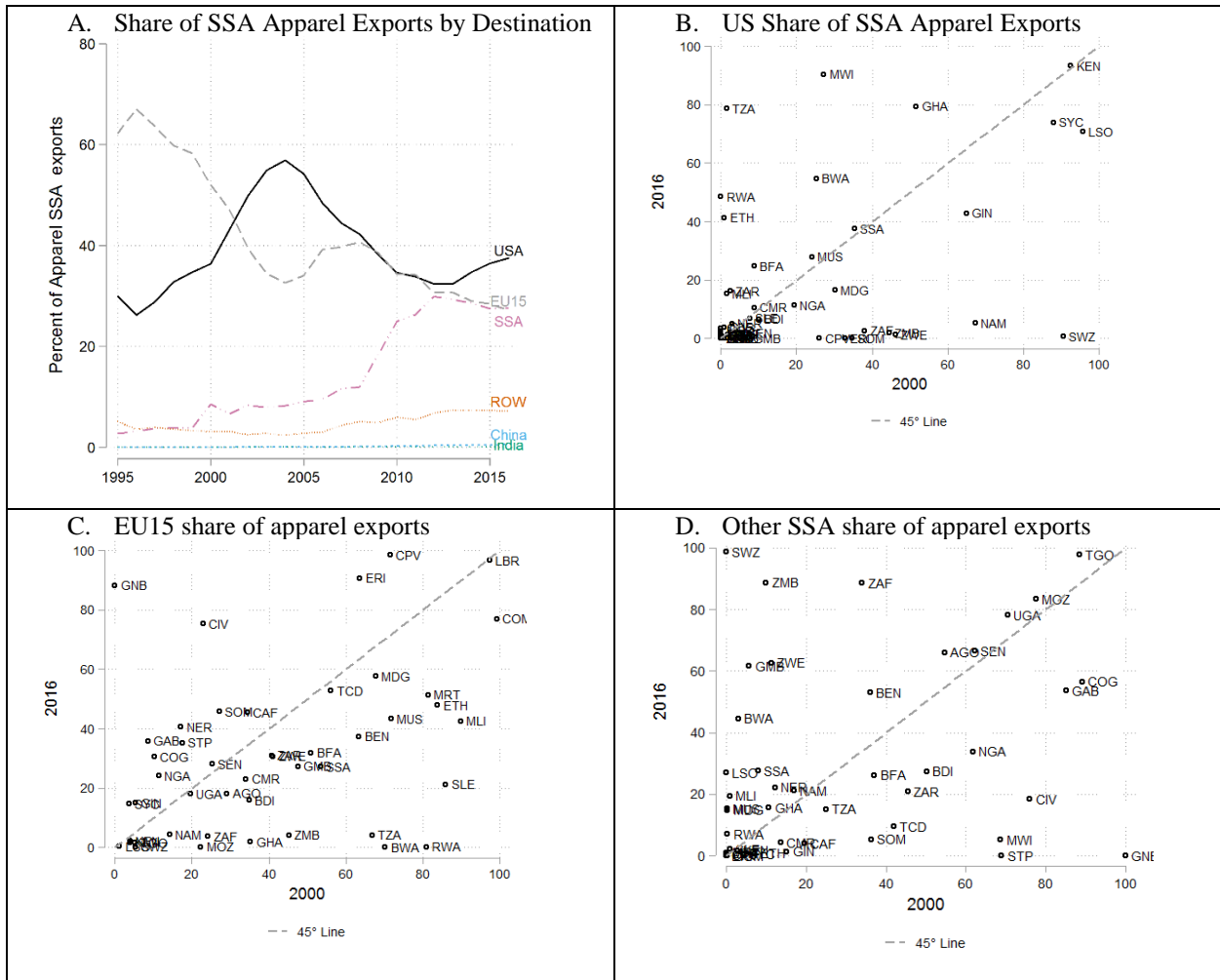


Source: WITS.

The share of the US in *Africa's apparel exports* grew substantially from 1995 until 2004, especially after 2001, but declined from 2005 onwards, and has hovered in the 35-40 percent range since 2010 (Figure 7.A). The share of the EU15 in SSA's apparel exports decreased strongly throughout the period, from 60 to 30 percent. The share of other SSA countries in SSA's apparel exports increased substantially and is, as of 2016, as large as the share to the EU15, while that to China and India is negligible.

For individual SSA countries, the shares of apparel exports to the US changed heterogeneously between 2000 and 2016, with dramatic increases for Ethiopia, Rwanda, and Tanzania and dramatic declines for Namibia and Eswatini (Figure 7.B). The share of apparel exports to the EU15 declined for almost all countries, most notably for Tanzania and Rwanda, whose exports shifted to the US (Figure 7.C). The share of apparel exports to other SSA countries increased substantially for Eswatini (shifting away from the US) and for South Africa, the main exporter to other SSA countries, shipping 90 percent of its apparel exports to those markets by 2016 (Figure 7.D).

Figure 7. SSA apparel exports and SSA countries' apparel exports by destination



Source: WITS.

5.2 AGOA and African export performance

Next, we examine in detail the exports of African countries to the US based on the US database on trade and market access. We start by depicting the value of total exports and then decompose it into three components: AGOA-eligible exports, other duty-free eligible exports (MFN zero, GSP, and GSP LDC), and dutiable exports. Total African exports to the US increased rapidly after the start of AGOA in 2001, reaching a peak of 82 billion USD in 2008, but then declined with the global financial crisis in 2009 and fell even more substantially with the decline in commodity prices from 2012 onwards, reaching a nominal value in 2016 only slightly higher than that in 1995 (Figure 8.A). Exports of AGOA-eligible products account for a high share of total exports and exhibit a similar inverted-U-shape pattern that follows the swings in commodity prices (since many AGOA-eligible products are commodities). Due to GSP and AGOA preferences, almost all SSA exports enter duty-free in the US. African manufacturing exports,

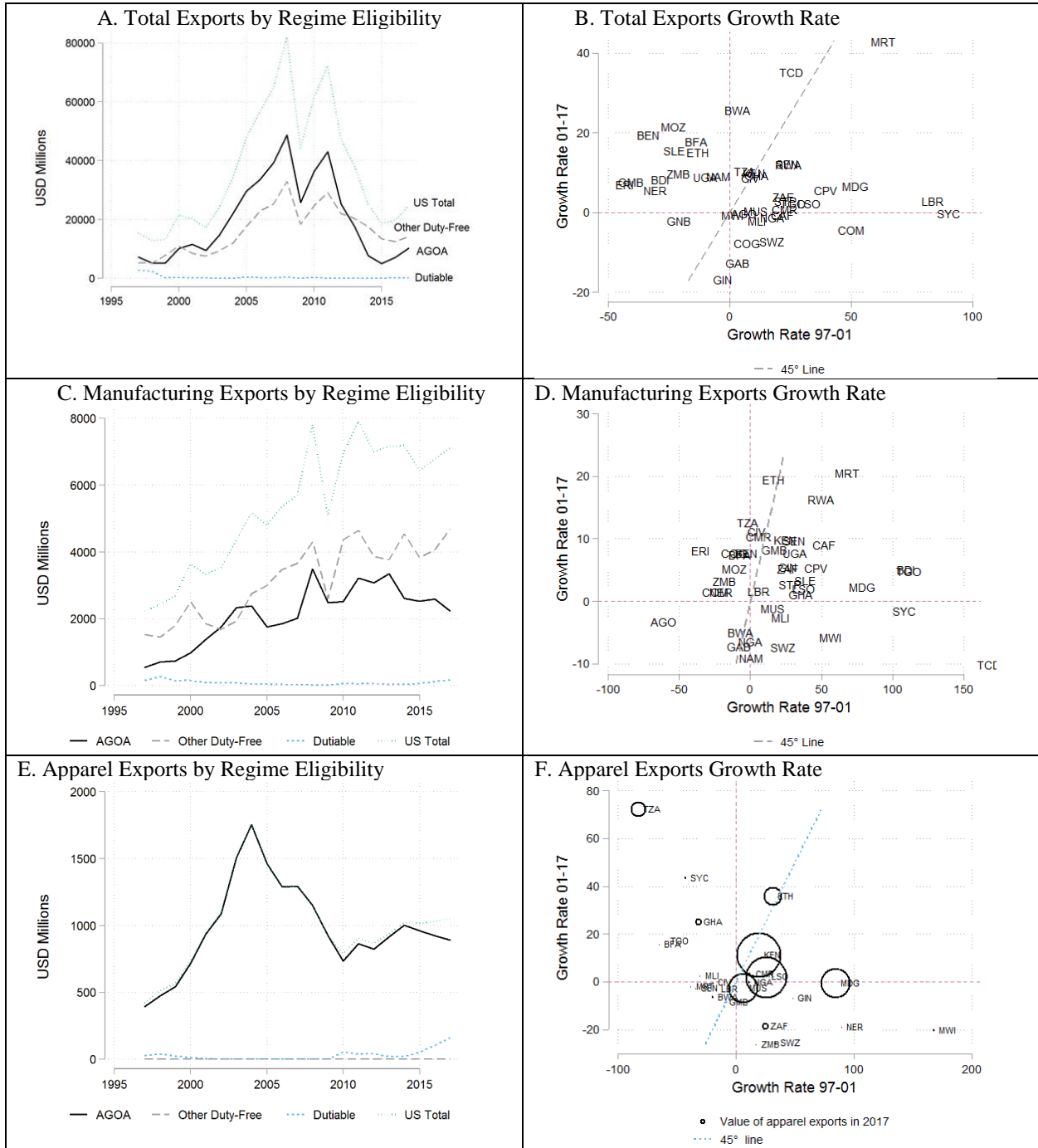
whose prices are less volatile than non-manufacturing exports, grew steadily from 1997 to 2007, after which they fell due to the global financial crisis and then stabilized afterwards (Figure 8.C). African apparel exports to the US grew rapidly after 1997, accelerating in 2000 and peaking in 2004 at 1.75 billion USD. From 2005 onwards, apparel exports declined steadily until 2010, bottoming out at 0.78 billion USD and then picked up slightly and stabilized at about 1 billion of USD (Figure 8.E). Almost all SSA apparel exports are eligible for duty-free treatment by the US under AGOA, except for countries that do not have an approved visa system or countries that lost the AGOA eligibility at some point over the 2001-2017 period.

To gain more insights into the role of AGOA, we examine the patterns of export growth for individual SSA countries before AGOA (1997-2001) and post-AGO (2001-2017). We compute for each country in each of these periods, average export growth as a compound growth rate in nominal exports, for total, manufacturing, or apparel.²⁷ For total exports to the US, all but three of the fourteen countries with negative average export growth prior to AGOA, see positive export growth thereafter (Figure 8.B).²⁸ But eight countries actually switch from positive export growth pre-AGO to negative export growth post-AGO. Hence, the pattern of overall export growth to the US across periods is quite heterogeneous across SSA countries. For manufacturing exports to the US, most countries had positive growth rates prior to AGOA which increase in magnitude post-AGO, with the top-growers post-AGO being Ethiopia, Mauritania, and Rwanda (Figure 8.D). Cameroon, Côte d’Ivoire, and Tanzania which had close to zero growth rates pre-AGO, saw rapid increases to averages of more than 10 percent per annum post-AGO. In contrast, Ghana, Lesotho, and especially Madagascar saw a dramatic decline in their positive growth rates pre-AGO of more than 20 percent per annum to less than 5 percent per annum post-AGO. For apparel exports to the US, most countries had small negative or small positive export growth rates prior to AGOA and maintain those rates post-AGO (Figure 8.F). A few countries with negative apparel export growth switch to positive export growth post-AGO, of which Tanzania exhibits the most dramatic increase to more than 60 percent average per annum growth post-AGO. Only a couple of countries – Ethiopia and Kenya – exhibit strong positive export growth in both periods, whereas several countries, including South Africa, Eswatini, and Zambia exhibit substantial negative export growth in both periods. We discuss in more detail the performance of apparel exports of SSA countries in the next sub-section.

²⁷ For each country and sub-period, the compound growth rate r in nominal exports E between year t_0 and year T is obtained as the solution to the equation $E_T = E_{t_0}(1 + r)^{T-t_0}$.

²⁸ The 3 countries with negative export growth in both periods are Guinea-Bissau, Guinea and Gabon.

Figure 8. SSA total, manufacturing and apparel exports to the US and SSA countries' export growth



Source: US database on trade and market access.

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. Growth Rates are calculated as compound growth rates between the first and last year nominal value of exports.

Finally, it is important to assess to what extent beneficiary African countries utilize the preferences granted under AGOA and GSP LDCs, since restrictive rules of origin or administrative burdens could be

an obstacle for imports to qualify for duty-free treatment. The utilization rate of AGOA, defined as the share of preference-eligible imports that enter using the preferential regime, was lower than 70 percent during the first years, but increased rapidly to close to 90 percent (see Appendix Figure C3).²⁹ 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).

5.3 Apparel exports to the US after AGOA: Four stories

We identify four groups of countries with different patterns of growth in apparel exports to the US after AGOA was introduced. First, we identify a group of countries that were eligible for apparel preferences, engaged in some exports of apparel to the US but with no clear pattern, and did not at any stage take significant advantage of AGOA. We designate these as the ‘missed opportunities’ group of which Cameroon is a typical example (Figure 9.A).³⁰ Second, we identify a group of countries which exhibited a large boom in apparel exports to the US immediately after AGOA, followed by a dramatic bust soon after the end of the MFA quotas in 2005, and settled at low levels of exports to the US subsequently. We designate these as the ‘boom-bust’ group of which Eswatini is a typical example (Figure 9.B).³¹ Third, we identify a group of countries with substantial growth in apparel exports after AGOA, which was negatively affected by the end of the MFA quotas in 2005. However, their exports did not disappear but remained stagnant afterwards. We designate these as the ‘growth and stagnation’ group, of which Lesotho is a typical example (Figure 9.C).³² Finally, we identify a small set of countries that experienced limited growth in apparel exports to the US immediately after AGOA was introduced but have subsequently shown steady growth that accelerated in the post-2010 period. We designate these as the ‘late and sustained success’ group of which Ethiopia is a typical example (Figure 9.D).³³ Appendix Figures C.3-C.5 show the patterns in apparel exports to the US for each SSA country (other than the four shown in Figure 9), and their allocation to each of the four groups.

²⁹ The low utilization rate observed in the first few years of AGOA 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.

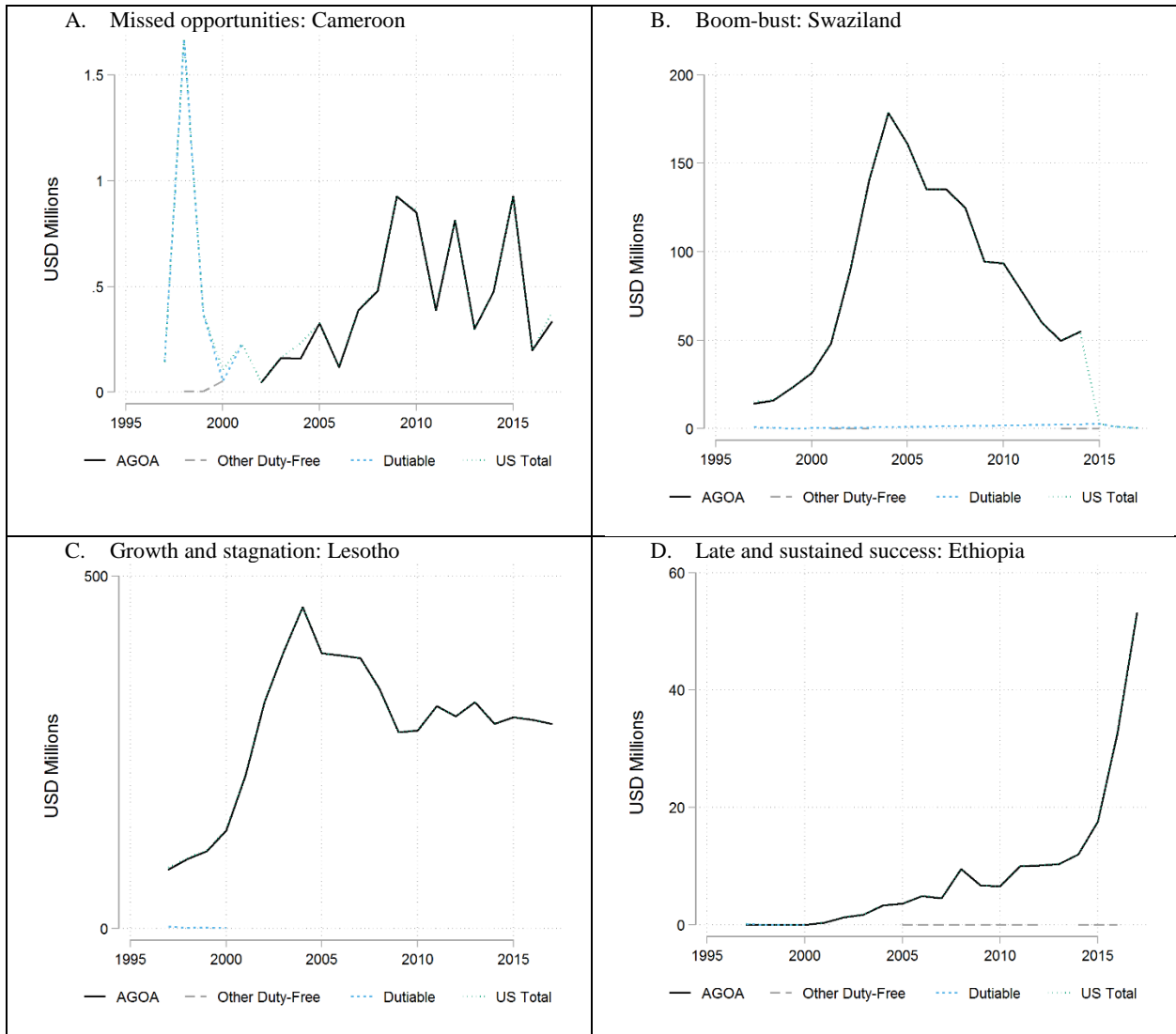
³⁰ Other countries in this group are Côte d’Ivoire, Ghana, Sierra Leone, Seychelles, and Zambia.

³¹ Other countries in this group are Botswana, Cabo Verde, Madagascar, Malawi, Mozambique, Namibia, South Africa, Eswatini, and Uganda.

³² The other country in this group is Mauritius.

³³ Other countries in this group are Kenya, Rwanda, and Tanzania.

Figure 9. Four stories of AGOA apparel exports



Source: US database on trade and market access.

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.

6. Econometric specification

How far are the changes discussed in Section 5 attributable to trade preferences and, for apparel, the erosion of preferences when the 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. This approach relies on several variants of the triple-differences specification with a stringent and rich set of fixed effects proposed by Frazer and Van Biesebroeck (2010). Our benchmark specification is given by:

$$\begin{aligned}
\ln(\text{Imp}_{cpt}) = & \sum_{r \in (s, ns)} \beta_{1r} \times \text{GSP}_p \times \text{GSP}_c \times \text{PostGSP}_{ct} \times 1\{c \in r\} \\
& + \sum_{j \in (n, e)} \beta_{2j} \text{ANonApp}_p \times \text{ANonApp}_c \times \text{PostANonApp}_{ct} \times 1\{c \in j\} \\
& + \beta_3 \text{AApp}_p \times \text{AApp}_c \times \text{PostAApp}_{ct} + \delta_{cp} + \delta_{ct} + \delta_{pt} + \epsilon_{cpt}
\end{aligned} \tag{2}$$

where *Imp* are US imports, *c* is an exporting country, *p* is an HS 6-digit product, *t* is a year, and ϵ is an independently and identically distributed (i.i.d.) error term. Our specification estimates separate impacts for five categories of treated products and countries. The first and second interaction terms capture the impact of the GSP policy change in 1997 that increased the number of duty-free products for GSP LDC eligible countries and territories (designated as GSP for short). It is defined as the product between an indicator for countries eligible for GSP LDC (GSP_c), an HS 6-digit indicator for the 810 products (see Panel B of Table 2) eligible for duty-free treatment under GSP LDC (GSP_p), and an indicator for the period from 1998 onwards (PostGSP_{ct}) which is country-varying since there is variation in country eligibility for GSP LDC.³⁴ the first interaction term covers African LDC countries (with the indicator *c* equal to *s*) while the second interaction term covers non-African LDC countries (with the indicator *c* equal to *ns*) to accurately capture our impact of interest which is that of nonreciprocal preferential treatment provided by the US to African countries.

The third and fourth interaction terms capture the impact of the AGOA policy change on non-apparel products. They are defined as the product between an indicator for AGOA-eligible countries (ANonApp_c), an indicator for the non-apparel HS 6-digit products that become eligible for duty-free treatment under AGOA (ANonApp_p), and an indicator for the period 2001 onwards when the AGOA general provision is enacted (PostANonApp_{ct}) which is country-varying as discussed in Section 4. For LDC countries most non-apparel products added under AGOA were already eligible for duty-free treatment under the GSP LDC scheme. In order to allow for differential effects, there are two non-apparel interaction terms, (i) one capturing impact for products that become eligible for duty-free treatment under AGOA for both LDC and Non-LDC African countries (the 91 AGOA Only products in Panel B of Table 2, new product having the indicator *j* equal to *n*) and (ii) another capturing the impact for products that become eligible for Non-LDC African countries (the 769 AGOA Non-LDC products in Panel B of Table 2, existing product having the indicator *j* equal to *e*).³⁵

³⁴ Even though 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 Equation (2).

³⁵ These 769 products were already eligible for duty-free entry for African LDC countries under US GSP LDC before AGOA was enacted.

The fifth interaction term is the product between an indicator for countries eligible to the AGOA apparel provision (designated in what follows as AGOA apparel-eligible countries) ($AApp_c$), an indicator for the set of 239 apparel HS 6-digit products (see Panel B of Table 2) eligible for duty-free treatment under AGOA ($AApp_p$) and an indicator for the period 2001 onwards when the AGOA apparel provision is enacted ($PostAApp_{ct}$) which is country-varying as discussed in Section 4.

Equation (2) includes country-product fixed effects δ_{cp} – the panel dimension of the data set – which imply that all coefficients are estimated based on *within* country-product variation over time, as well as country-year fixed effects δ_{ct} and product-year fixed effects δ_{pt} .³⁶ Country-year fixed effects are a way to account flexibly for overall demand and supply and other economy-wide shocks in the exporting countries, including those related to the global financial crisis which falls within our sample period.

While Equation (2) is a specification with a very stringent set of fixed effects, the coefficients can be given a causal interpretation only if we assume that the timing of the expansion of GSP products to LDC in 1997 and the AGOA implementation in 2001 are exogenous. More specifically, for a significant increase in exports of eligible products from beneficiary African countries to be attributable to AGOA or GSP LDC, our double interaction terms (product X country) should not be correlated with the movements in exports before these preferences came into force. On the one hand, if beneficiary African countries were experiencing a relatively significant decline in their exports to the US in eligible products prior to AGOA or GSP LDC, a specification ignoring such trends could result in a downward bias in the estimated impacts of AGOA or GSP LDC. On the other hand, if beneficiary African countries were experiencing a relatively significant increase in their exports to the US in eligible products prior to AGOA or GSP LDC, a specification ignoring such trends could result in an upward bias in the estimated impacts of AGOA or GSP LDC.

To account for the possibility of differential pre-treatment time trends for the various treated groups, we augment our baseline specification in Equation (2) with several treated group-specific time trends to obtain our preferred specification:³⁷

³⁶ The inclusion of this rich and stringent set of fixed effects implies that Equation (2) is a more general and unrestrictive specification than a pure triple-differences specification. Essentially, it controls for the ‘levels’ variables that would be required for such a specification via the fixed effects.

³⁷ 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.

$$\begin{aligned}
\ln(\text{Imp}_{cpt}) = & \sum_{r \in (s, ns)} \beta_{1r} \times GSP_p \times GSP_c \times \text{PostGSP}_{ct} \times 1\{c \in r\} \\
& + \sum_{j \in (n, e)} \beta_{2j} \text{ANonApp}_p \times \text{ANonApp}_c \times \text{PostANonApp}_{ct} \times 1\{c \in j\} + \beta_3 \text{AApp}_p \times \text{AApp}_c \times \text{PostAApp}_{ct} \\
& + \sum_{r \in (s, ns)} \gamma_{1r} \times GSP_p \times GSP_c \times t \times 1\{c \in r\} + \sum_{j \in (n, e)} \gamma_{2j} \text{ANonApp}_p \times \text{ANonApp}_c \times t \times 1\{c \in j\} \\
& + \gamma_3 \text{AApp}_p \times \text{AApp}_c \times t + \delta_{cp} + \delta_{ct} + \delta_{pt} + \epsilon_{cpt}
\end{aligned} \tag{3}$$

where all variables are defined as above and t is a time trend taking value 1 in the first sample year 1992, 2 in 1993, ..., up to 26 in 2017. Therefore, Equation (3) estimates the impact of the AGOA or GSP LDC policy changes on eligible countries after controlling for potential differences in the export paths of eligible products of those eligible countries to the US. Those time trends account for any existing differences in the dynamics of exports to the US for treated countries and products that existed prior to the enactment of the US trade preferences and may have persisted thereafter, which are captured by the estimated coefficients $(\gamma_{1s}, \gamma_{1ns}, \gamma_{2n}, \gamma_{2e}, \gamma_3)$.

The interpretation of the estimated coefficients on the interaction terms in Equation (3) is as follows. For example, the coefficient β_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 increase in exports of all products to the US by that country, to the increase in exports of all countries to the US of that product, and to the base level of exports to the US of that product by that country before AGOA. This base level is an average of exports of that product by the country prior to the country becoming eligible for AGOA (typically this would be over the period 1992-2001). The coefficient β_3 is also purged from potential differential trends in exports of that AGOA-eligible apparel product by the AGOA apparel-eligible country before AGOA since this differential trend is captured by γ_3 .

In practice, the dependent variable used in Equation (3) is defined as the log of US imports at the country-HS 6-digit-year level plus 1, to allow us to keep in the estimating sample all zero trade flows and thus address potential selection biases. Hence, Equation (3) captures the impact of preferential US market access under AGOA or GSP LDC on African countries' exports at the intensive and extensive margin. In order to capture separately an impact on the probability of exporting - the extensive margin - we follow Frazer and Van Biesebroeck (2010) and estimate a version of Equation (3) where the dependent variable is an indicator variable for positive trade flows. The use of OLS estimation for this version of Equation (3) implies the use of a linear probability model which has the shortcoming that the predicted probabilities may not be meaningful since they can lie outside the $[0,1]$ interval. However, as suggested by Frazer and Van Biesebroeck (2010), this is unlikely to be a binding shortcoming since 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 that are controlled for.

Apart from the fact that we take a much longer view of the impact of trade preferences, there are two other key differences – which we argue are advantages – in our study relative to the study by Frazer and Van Biesebroeck (2010). First, our consideration of a longer period starting in 1992, allows us to estimate the impact of the change in GSP LDC policy in 1997 – which led to additional products becoming eligible for duty-free treatment for LDC countries (see Section 4) - as separate from those of AGOA. In Frazer and Van Biesebroeck (2010), the sample period started in 1998, which implied that they measured as an impact of AGOA on non-apparel products what was in fact an impact of GSP LDC on products that were already duty-free since 1997, rather than from 2001 onwards as they consider in their specifications. Second, our preferred specification Equation (3) includes treated-group specific time trends which account for the possibility of differential pre-treatment trends between treated and untreated product-country cells, which helps to ensure that we estimate causal impacts of the AGOA and the GSP LDC policy change.

The coefficients estimated in Equation (3) provide the average impact of GSP LDC and AGOA over the entire period following the enactment of these policy changes. But it is of interest to understand the dynamics of the 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 accelerate, stabilize, or mean-revert. To this end, we estimate a variant of Equation (3) where each interaction term is interacted further with year fixed effects, implying that each interaction term is allowed to have a different coefficient in each year (for the first two interaction terms, this implies separate coefficients for years from 1998 onwards and for the other interaction terms this implies separate coefficients for years from 2001 onwards).

As an alternative to Equation (3), in a robustness check we use detailed data on tariffs that the US applied to all HS 6-digit products and all countries over the period 1997-2017. These data were used to estimate the trade effects of tariff preferences granted by the US under different schemes, including AGOA, controlling for the same set of fixed effects as in Equation (3).³⁸ The details and the results for this specification are provided in the appendix.

7. Estimated impacts of AGOA and GSP LDC

We begin with a baseline specification and then delve deeper into the impact of preferences on apparel and the issue of export diversion from other destination markets.

7.1 Baseline estimates

³⁸ This specification is closely related to Thelle et al. (2015), who evaluate the impact of nonreciprocal trade preferences granted by the EU to developing countries' exports.

Before turning to the econometric estimates, Table 2 provides some statistics based on the sample that is used for the regressions, focusing on characteristics prior to AGOA. The estimating sample includes 27,420,560 observations, of which 87 percent have zero imports. Table 2 shows that, relative to control countries, AGOA-eligible countries export to the US substantially fewer HS 6-digit products and smaller values, whether the products are AGOA-eligible or not. On average, a country that has been declared AGOA-eligible at any point has positive exports to the US in only 97 HS 6-digit products whereas that number is 734 for control countries. However, there is enormous variation across eligible countries.

Table 2. Summary statistics based 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 and US MFN tariff rates

		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
US MFN tariff rate	Mean	5.0%	4.3%	7.3%	11.2%
	Max	21.9%	10.0%	13.3%	15.6%

Note: the total number of products in the HS classification at 6-digits is 5,070. The numbers in parentheses in the column headings are, in Panel A the number of AGOA countries and the number of control countries and in Panel B the numbers of eligible HS 6-digit products in each of the categories

Table 3 presents in the first two columns the results from estimating Equation (2) and in all other columns the results from estimating Equation (3) that controls for treated group-specific time trends. The results are based on data at the exporting country-HS 6-digit product-year level, including positive as well as zero import flows to the US. All specifications are the triple-differences regressions that control for country-product, country-year, and product-year fixed effects. Inference is based on standard errors robust to heteroscedasticity with the Huber-White approach, clustered at the product level.³⁹

³⁹ 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 current version of 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

The estimates in column (1) show positive and significant impacts of the expansion of duty-free products for GSP LDC from 1998 onwards, as well of AGOA non-LDC, non-apparel and apparel for the exports of beneficiary countries in Africa. But our preferred baseline estimates are those in column (2) that address the concern of potential biases due to the presence of differential pre-treatment trends for beneficiary countries and products. Those estimates show a positive and significant impact of the expansion of duty-free products for GSP LDC from 1998 onwards for beneficiary countries in Africa.⁴⁰ African countries increase on average their exports to the US of the GSP LDC additional products eligible for duty-free treatment from 1998 onwards, relative to their pre-1997 levels by 12 percent.⁴¹ Regarding the impacts of AGOA, column (2) shows they are insignificant on non-apparel products for both non-LDC as well as LDC countries. This stands in contrast to the significant positive effects shown in column (1) without treated group-specific time trends thus revealing the importance of accounting for those trends. The important boost to exports provided by AGOA is estimated for apparel products that increased by 22 percent for AGOA-eligible countries from 2001 onwards, relative to their pre-AGOA levels. The positive and significant coefficients for the group-specific trends suggest that the eligible products from beneficiary countries were growing faster during the sample period relative to the control groups.⁴²

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.

⁴⁰ The impact of GSP LDC on exports of LDC countries outside Africa is actually negative and significant.

⁴¹ This marginal effect corresponding to the coefficient of 0.114 in Table 3 is obtained as $(e^{0.114}-1.) * 100$.

⁴² Regarding the treated group-specific trends, we find all trends have a positive and significant coefficient but the trend for apparel products is significant only at a 10 percent confidence level.

Table 3. Baseline impacts of AGOA and GSP and some 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)	Log (US imports + 1)	Log (US imports + 1)	Log (US imports + 1)	Log (US imports + 1)
			Excluding OECD	Excluding non- GSP	Excluding China	Controlling for competition	1998-2006	
	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)
Time trend for ever GSP LDC Africa		0.009*** (6.12)	0.001*** (8.56)	0.005*** (4.86)	0.011*** (6.94)	0.009*** (6.09)	0.011*** (7.39)	0.013*** (5.76)
Time trend for ever GSP LDC Non-Africa		0.005*** (3.32)	0.001*** (4.80)	0.001 (0.69)	0.008*** (5.17)	0.005*** (3.30)	0.006*** (3.68)	0.008** (2.88)
Time trend for ever AGOA Non-LDC		0.007*** (5.60)	0.001*** (6.49)	0.003** (3.28)	0.008*** (6.75)	0.006*** (5.55)	0.006*** (5.04)	0.006* (2.39)
Time trend for ever AGOA Non-apparel		0.014*** (3.54)	0.001*** (3.07)	0.007* (2.39)	0.010* (2.26)	0.013*** (3.31)	0.013** (2.72)	0.021** (3.03)
Time trend for ever AGOA apparel		0.006* (2.20)	-0.0001 (-0.61)	0.004 (1.65)	-0.009** (-3.11)	0.005 (1.95)	0.010*** (3.31)	0.020** (2.90)
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)	
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. Column (1) provides estimates for Equation (2) while columns (2)-(8) provide estimates for Equation (3).

Two crucial remarks need to be made about the baseline estimates in Table 3. First, recall that they are obtained controlling for time-varying country and product changes in US imports, and therefore account for any overall surge or drop in US imports from AGOA countries for eligible and non-eligible products as well any overall surge or drop in US imports of AGOA- 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 margin of exports to the US, since zeros are included in the estimating sample. Column (3) shows the estimates of the impact of AGOA and GSP LDC purely 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.⁴³

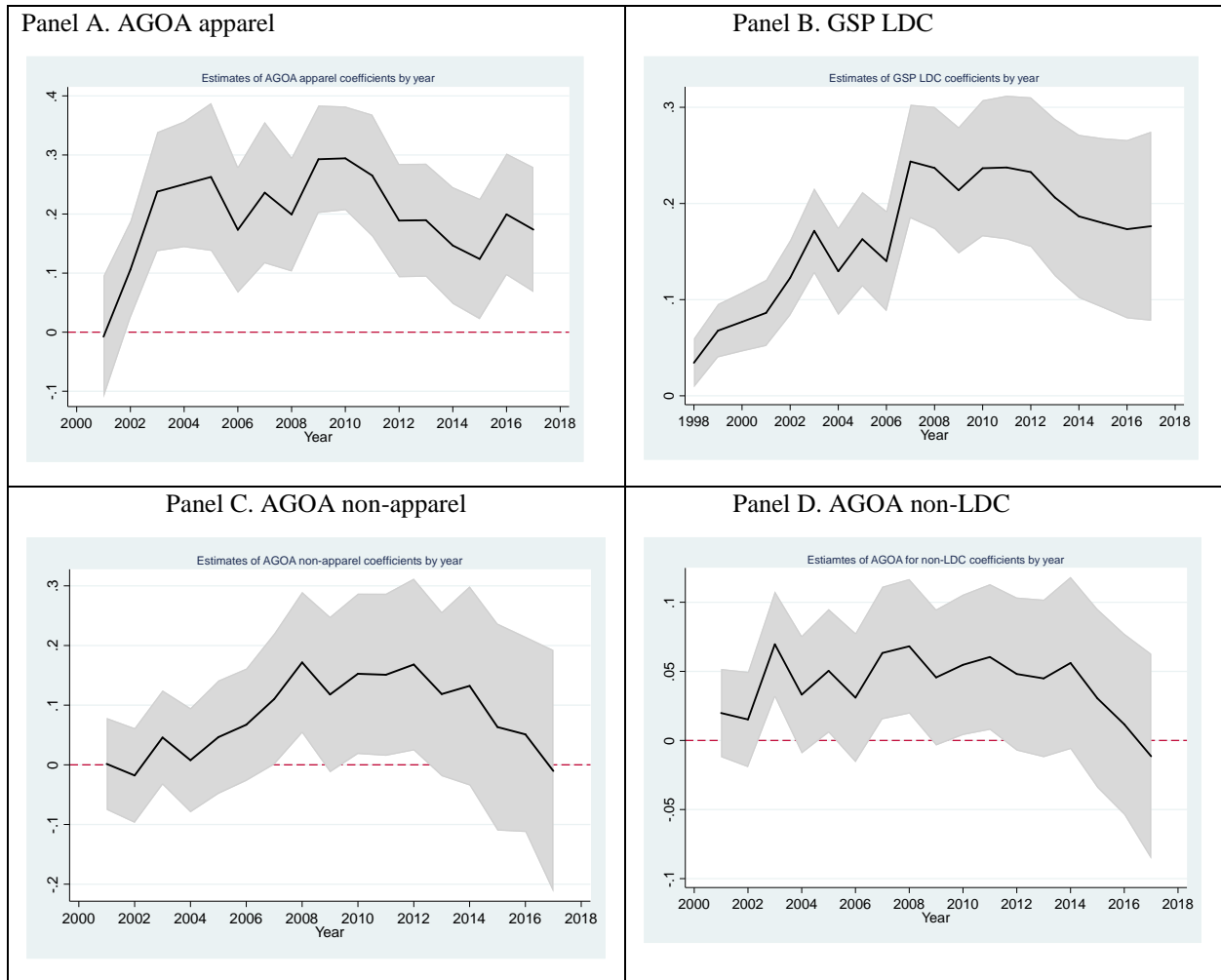
The baseline estimates in Table 3 show the average impact of GSP for LDC and AGOA over the entire post-implementation period, but one of our objectives is to understand the timing and durability of the effects of trade preferences offered by the US. To examine how quickly and persistently African countries respond to policy changes under AGOA and GSP LDC, we allow each interaction term in Equation (3) to have a different coefficient in each year post-implementation. We show the corresponding coefficients and 95 percent confidence intervals for each year in Figure 10. Panel A shows that the effect of AGOA on exports to the US of apparel products by AGOA-eligible countries starts low but then explodes over the first four years after AGOA enactment. After the phasing out of the MFA quotas, the effect of AGOA fluctuates slightly but in broad terms, levels off (and the impact actually decreases between 2011 and 2015). Specifically, the estimate of the impact of AGOA on apparel is zero in 2001 and increases fast 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 it may reflect the increase in transshipment of Chinese exports, as shown by Rotunno, Vezina, and Wang (2013). The leveling off of marginal impacts of AGOA on African exports of apparel could be a consequence of the erosion of preferences for African countries after the end of the MFA quotas, which led to fiercer competition in the US market from Asian giants.

Panel B-D in Figure 10 display the effects AGOA on non-apparel products. Panel B shows the impact of GSP LDC on eligible products for African LDC countries increasing over the first 10 years starting in 1998 then leveling off and declining after 2012. Panel C shows the impact of AGOA on exports of non-apparel products that become eligible for duty-free treatment under AGOA for all African countries and Panel D shows the impact of AGOA on non-apparel products whose duty-free treatment under GSP LDC is extended to non-LDC African countries. The coefficients on these two groups are insignificant on average in Table 3 and they are also insignificant in most years. Table 3 presents not only our baseline results but also several robustness checks to those results. Columns (4)-(6) provide impact estimates using three alternative estimating samples. We exclude from the estimating sample OECD countries in column (4) and non-GSP countries in column (5) with the objective of estimating Equation (3) using potentially more similar control groups for the African countries. We exclude China from the control group in column (6),

⁴³ In Appendix Table D.1 we unbundle non-apparel products into three groups - agriculture, manufacturing, and mining - and re-estimate Equation (3) allowing each of the interaction terms to differ across the three groups. The results show that African LDC countries increase exports to the US of their agriculture and manufacturing products eligible for GSP LDC from 1998 onwards, relative to their pre-1997 levels. Manufacturing products whose duty-free treatment is extended to non-LDC African countries under AGOA also increase significantly, relative to their pre-2001 levels. Exports of agriculture products under AGOA increase significantly. Positive and significant impacts on the extensive margin are found for manufacturing products under GSP LDC and for agriculture products under AGOA for all African countries. Regardless of preference eligibility, impacts of GSP LDC or AGOA on mining products are insignificant.

given the dramatic increase in its exports to the US over the sample period (particularly of apparel products). The results in the three columns are qualitatively similar to those in column (2), and the magnitudes of the coefficients on AGOA apparel are almost unchanged, whereas that on GSP LDC products declines in magnitude when OECD countries are dropped.

Figure 10. 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 Equation (3) allowing for separate coefficients each year after GSP LDC (panel B) or AGOA (panels A, C, and D).

Given our long sample period, the trade effects of nonreciprocal trade preferences granted under AGOA and GSP LDC 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 our specification in column (7), the relative preference margin. As defined in Section 5, that variable measures for each HS 6-digit product in a year the difference between the weighted average tariff paid by competitor countries and the weighted average tariff

paid by the country. Higher competition-adjusted RPMs, which indicate a higher preference, are shown to be significantly linked to higher export growth to the US. Since the RPM does not accurately capture the degree of protection in the US for apparel products under MFA quotas, we also include in this specification an indicator variable of whether the country-HS 6-digit product faced an MFA quota in the US (prior to 2005) as well as a weighted average of the presence of MFA quotas on competitor countries exporting that HS 6-digit product to the US. We find no significant effect of the average MFA quota imposed on the rest of the world. Surprisingly, we find a positive and significant effect on the own country-product quota dummy. This may simply reflect the fact that the MFA quota is endogenous to the export flows, in the sense that the MFA quota was more likely to be imposed when a country-product had experienced significant export growth to the US. More importantly, accounting for competition from other countries with preferential access to the US market reduces the magnitude but does not change qualitatively the significant positive impact of AGOA on apparel products, but the impact on GSP LDC products becomes insignificant.

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 our pattern of yearly effects shown in Panel A of Figure 10. Our separate impacts of GSP LDC and AGOA on non-apparel products show a positive and significant average response of exports only for GSP LDC duty-free products, which raises a concern that the estimated positive impact on non-apparel products found by Frazer and Van Biesebroeck (2010) confounds the gains from GSP LDC and from AGOA. In column (8) of Table 3, we explicitly use the Frazer and Van Biesebroeck (2010) sample period of 1998-2006 and find a significantly higher response for apparel products and a significantly smaller response for GSP LDC products relative to our baseline results. The differences may be because we consider a longer pre-AGOA period but also because we control for potential differential pre-existing trends for treated countries and products.⁴⁴

7.2 Delving into the AGOA impact on apparel exports

The results presented so far show that the estimated impact on apparel increases over time and then becomes flat after 2005, which coincides with the end of the MFA quotas. We now turn to a more detailed investigation of the impact of AGOA on apparel products. We begin by examining whether the end of the

⁴⁴ We consider an alternative to our baseline specification described in Appendix D, where instead of treated countries and eligible products, we estimate the impact of tariff preferences granted by the US under different schemes using data on US tariffs on HS 6-digit products and all countries over the period 1997-2017. The results shown in Appendix Table D.2 indicate that, on average across all countries, US import tariff liberalization does not significantly increase export growth at the country-product level. However, when the effect is allowed to differ across African and non-African countries, US tariff preferences significantly increase export growth for African countries. Some interesting differences are also identified when the effect of US tariff preferences is allowed to differ across groups of products: US tariff preferences have a significant positive impact on the growth of apparel exports as well as on the growth of manufacturing exports from African countries. We view these results as consistent with those we obtain with our baseline triple-differences specification.

MFA in 2005, which unleashed the exports of apparel from China and other emerging Asian countries, mitigates or eliminates the positive impact of AGOA on apparel exports for African countries.

We re-estimate Equation (3) allowing the apparel interaction term to be sub-divided into two terms, one where the variable PostAApp_{ct} is an indicator for years 2001-2004 and one where that variable is an indicator for years 2005-2017. The corresponding results are shown in column (1) of Table 4. The average impact of AGOA on apparel products is higher in the period following the end of the MFA quotas than in the initial years after the introduction of AGOA. The difference in these two coefficients is significant at the 5 percent level. Again, this combines the impact of starting to export new products to the US and expanding exports of existing products to the US. The somewhat unexpected pattern of a stronger positive impact of AGOA after the end of the MFA quotas can be understood by revisiting the evidence in Panel A of Figure 10, which shows a very small initial impact of AGOA in 2001, which then increases substantially and results in a smaller average impact in 2001-2004 than the average impact of AGOA from 2005 onwards.

We next investigate whether there is country or sub-regional heterogeneity in the impact of AGOA on apparel. First, considering country heterogeneity and returning to an average impact of AGOA over the entire 2001-2017 period, we plot in Appendix Figure D.1 the coefficient on the apparel interaction term obtained by re-estimating Equation (3) allowing the impact of each interaction term to be different for each African country. The countries exhibiting 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 experience on average a negative impact of AGOA on their apparel exports to the US.

Table 4. Impacts of AGOA on apparel across sub-periods

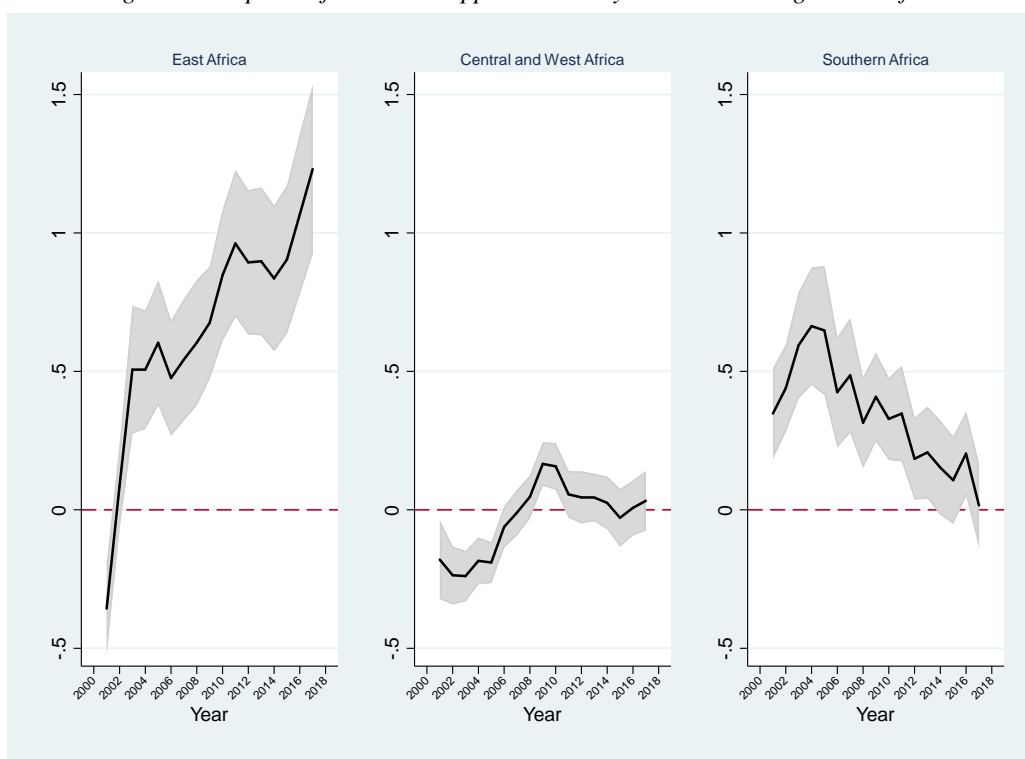
	Data at country-HS 6-digit-year level (including zeros) is used Dependent variable is: Log (US imports + 1) (1)
GSP LDC * Africa	0.113*** (6.68)
GSP LDC * Non-Africa	-0.046* (-2.43)
AGOA Non-LDC	0.0270 (1.84)
AGOA Non-apparel	0.0631 (1.73)
AGOA apparel * 2001-2004	0.174*** (4.20)
AGOA apparel * 2005-2017	0.223*** (4.77)
Time trend for ever GSP LDC Africa	0.009*** (6.13)
Time trend for ever GSP LDC Non-Africa	0.005*** (3.32)
Time trend for ever AGOA Non-LDC	0.007*** (5.61)
Time trend for ever AGOA Non-apparel	0.014*** (3.54)
Time trend for ever AGOA apparel	0.004 (1.70)
Country-product fixed effects	Yes
Country-year fixed effects	Yes
Product-year fixed effects	Yes
Observations	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 for a variant of Equation (3) with two period coefficients on the apparel interaction term shown.

Second, in order to assess whether and to what extent AGOA had differential impacts on exports of apparel across African sub-regions before versus after the liberalization of the MFA quotas, we re-estimate Equation (3) allowing the apparel interaction term to vary across years and its coefficient to be separately estimated for three sub-regions: East Africa, Central and West Africa, and Southern Africa. We plot the corresponding coefficient estimates with the 95 percent confidence intervals in Figure 11. The figure shows a differential response to AGOA and the MFA liberalization across sub-regions. For Central and West Africa, the impacts of AGOA on apparel exports are mostly insignificant. AGOA has a growing positive impact on apparel exports from East Africa - the impact is significantly lower in the early AGOA period than in the years following the end of the MFA quotas. In contrast, for Southern Africa the average impact of AGOA on apparel exports is significantly higher in the early AGOA period and it decreases after

2005 with the end of the MFA quotas until it is not significantly different from zero. While the Southern African countries initially took advantage of the opportunities created by AGOA, they suffered more after the end of the MFA quotas. The decline in the impact of AGOA in the face of increased competition from previously quota-constrained countries such as China after 2005 suggests that the US trade preferences did not help the Southern African countries to build a durable comparative advantage in apparel exports. The results show patterns that are largely consistent with the four apparel stories emerging from the raw export data that were discussed in Section 5.

Figure 11. 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 Equation (3) allowing for separate coefficients each year after AGOA.

7.3 AGOA: Export Creation vs Export Diversion

Our findings suggest that the nonreciprocal trade preferences provided by the US under AGOA and GSP LDC led to a significant increase in exports to the US by beneficiary African countries, especially of apparel. We need to consider two possibilities. First, that the increase did not represent new export creation but simply the redirection of African exports from other trading partners to the US in response to the trade preferences. Second, that the increase in exports was a consequence not of preferential access per se, but of developments in exporting countries favoring specific products in specific years, such as the establishment

of export processing zones for apparel – i.e., country-product-year level changes which are not taken care of by our fixed effects. One way of examining these possibilities is by assessing how African exports to other destinations change in response to the AGOA preferences. If exports to other destinations decline as much as those to the US increase, then trade diversion seems likely. If exports to other destinations also increase, then domestic sector-specific supply side factors are (also) likely to be playing a role.

We re-estimate Equation (3) using first as dependent variable, EU imports at the country-HS 6-digit-year level and show the results in Table 5. We consider the EU separately for two reasons: as we discussed in Section 4, the EU is a major trading partner for most African countries; and Eurostat's COMEXT provides disaggregated EU import data for a long period (1992-2016) overlapping with that used for our main analysis on the impact of GSP LDC and AGOA. We then consider the EU along with the rest of the world (ROW), and in the final step we pool across the US market and the EU and ROW markets to examine the possibility of omitted variable bias. Table 5 reports in column (1) that the baseline results on the impact of GSP LDC and AGOA on US imports are qualitatively unchanged when we restrict the sample to be the same as that used in subsequent columns for EU imports (this implies dropping year 2017 and excluding all 28 EU countries from the control group). Column (2) reports the results from estimating Equation (3) using as dependent variable the logarithm of EU imports plus one (to account for zeros). The negative and significant coefficient on the apparel interaction term suggests the AGOA trade preference shock reduced exports of apparel by African countries to the EU. Although the EU provided generous tariff preferences to LDC African exporters, the EU's rules of origin requirements were relatively stringent, as described in De Melo and Portugal-Perez (2013). Our finding of a negative effect of AGOA preferences on apparel exports to the EU stands in contrast with the finding by Frazer and Van Biesebroeck (2010) of no trade redirection from the EU. The likely reason for the difference in results is their consideration of a short period of time before and after the enactment of AGOA (1999, 2000, 2002, and 2003). Column (3) allows the impact on apparel to differ across periods 2001-2004 and 2005-2016 and shows declines in exports of apparel products by African countries to the EU in both periods.

Next, we consider potential trade redirection of African exports not only from Europe but also from other destination markets, relying on WITS/COMTRADE data for import flows by the EU and all other countries - designated as rest of the world (ROW) - and the US (for comparison) over the period 1992-2016. Again column (4) reports qualitatively unchanged baseline results on the impact of GSP LDC and AGOA on US imports for the WITS/COMTRADE data (this implies dropping year 2017 and excluding all 28 EU countries from the control group). Column (5) reports the results from estimating Equation (3) using as dependent variable the logarithm of EU and ROW imports plus one (to account for zeros). The negative and significant coefficient on the apparel interaction term suggests that the AGOA trade preferences reduced the exports of apparel by African countries to all countries other than the US. Column (6) shows

declines in both periods 2001-2004 and 2005-2016 in exports by African countries of apparel products to countries other than the US.

Column (3) shows that African exports to the EU15 increased for non-apparel products that became eligible for duty-free treatment by the US under GSP LDC and, as columns (5) and (6) show, that is also true for African exports to the EU and ROW. A potential reason for these findings can be that the rapid growth of exports to the US helped African countries to increase their exports also to other destinations because of economies of scale or by learning-by-doing or learning-by-exporting mechanisms. But this explanation raises the question as to why such mechanisms would operate for GSP LDC products and not for apparel products.

Table 5. 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 (EU imports + 1)	Log (US imports + 1)	Log (EU+ROW imports + 1)	Log (EU+ROW imports + 1)	Log (US + EU + ROW imports + 1)	Log (US + EU + ROW imports + 1)
	(1)	COMEX data (2)	(3)	(4)	WITS/COMTRADE data (5)	(6)	WITS/COMTRADE data (7)	(8)
GSP LDC * Africa	0.126*** (6.79)	0.053*** (4.57)	0.053*** (4.57)	0.125*** (6.81)	0.081*** (5.08)	0.080*** (5.07)	0.075*** (3.95)	0.074*** (3.93)
GSP LDC * Non-Africa	-0.0327 (-1.67)	0.031** (2.78)	0.031** (2.78)	-0.0360 (-1.86)	0.047** (3.03)	0.047** (3.03)	-0.037 (-1.88)	-0.037 (-1.88)
AGOA Non-LDC	0.0309 (1.94)	-0.004 (-0.43)	-0.004 (-0.43)	0.0375* (2.43)	0.019 (1.28)	0.019 (1.28)	-0.001 (-0.07)	-0.002 (-0.10)
AGOA Non-apparel	0.0591 (1.56)	0.028 (1.36)	0.028 (1.36)	0.0702 (1.79)	0.078** (2.64)	0.078** (2.64)	0.096** (2.72)	0.096** (2.71)
AGOA apparel	0.202*** (5.04)	-0.067*** (-6.54)		0.196*** (4.73)	-0.116*** (-9.42)		0.127*** (3.38)	
AGOA apparel * 2001-2004			-0.071*** (-5.96)			-0.122*** (-8.30)		0.090* (2.39)
AGOA apparel * 2005-2017			-0.063*** (-5.14)			-0.111*** (-7.40)		0.159*** (3.83)
Time trend for ever GSP LDC Africa	0.010*** (6.20)	-0.003*** (-3.52)	-0.003*** (-3.52)	0.010*** (6.26)	-0.010*** (-8.11)	-0.010*** (-8.11)	-0.002 (-1.41)	-0.002 (-1.41)
Time trend for ever GSP LDC Non-Africa	0.006*** (3.82)	-0.006*** (-6.35)	-0.006*** (-6.35)	0.006*** (3.86)	-0.014*** (-10.80)	-0.014*** (-10.80)	-0.007*** (-4.83)	-0.007*** (-4.83)
Time trend for ever AGOA Non-LDC	0.008*** (6.09)	-0.002** (-2.88)	-0.002** (-2.88)	0.007*** (5.96)	-0.006*** (-5.82)	-0.006*** (-5.82)	0.0005 (0.43)	0.0005 (0.45)
Time trend for ever AGOA Non-apparel	0.016*** (3.81)	-0.001 (-0.56)	-0.001 (-0.56)	0.014*** (3.44)	-0.001 (-0.43)	-0.001 (-0.43)	0.013*** (3.48)	0.013*** (3.48)
Time trend for ever AGOA apparel	0.005 (1.73)	0.001 (1.16)	0.001 (1.16)	0.005 (1.89)	0.014*** (7.75)	0.014*** (8.24)	0.022*** (9.04)	0.020*** (8.27)
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	24,588,684	24,588,684	24,588,684	25,445,675	25,445,675	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 Equation (3) or a variant with two period coefficients on the apparel interaction term and 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.

Columns (7) and (8) show the results from estimating Equation (3) using as dependent variable the sum of exports to the US, EU, and the rest of the world at the country-HS 6-digit-year level again relying on WITS/COMTRADE data. These results confirm that aggregate exports increase, suggesting that even

though there is evidence of export diversion, AGOA did lead to export creation reflected in growth in the aggregate exports of beneficiary countries.

As noted above, another concern with our baseline specification is that the positive impact of AGOA trade preferences could be driven by unobserved omitted variables at the exporting country-product-year level, such as 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. However, the negative apparel coefficient in columns (2)-(3) and (5)-(6) offers some evidence against this concern.

In order to account for potential omitted variable biases more systematically, we estimate a different type of specification, where we pool across the US market and the EU and ROW markets, such that for each country-HS 6-digit product-year there are two observations. This specification is inspired by that proposed by Defever and Ornelas (2015) to study third-market effects of the end of MFA quotas on Chinese exporters of apparel. The specification that we estimate is given by:

$$\begin{aligned}
\ln(\text{Imp}_{cpt}) = & \sum_{r \in (s, ns)} \beta_{1r} \times GSP_p \times GSP_c \times PostGSP_{ct} \times 1\{c \in r\} \times 1\{d = USA\} \\
& + \sum_{j \in (n, e)} \beta_{2j} \text{ANonApp}_p \times \text{ANonApp}_c \times Post\text{ANonApp}_{ct} \times 1\{c \in j\} \times 1\{d = USA\} \\
& + \beta_3 \text{AApp}_p \times \text{AApp}_c \times Post\text{AApp}_{ct} \times 1\{d = USA\} \\
& + \sum_{r \in (s, ns)} \gamma_{1r} \times GSP_p \times GSP_c \times t \times 1\{c \in r\} \times 1\{d = USA\} \\
& + \sum_{j \in (n, e)} \gamma_{2j} \text{ANonApp}_p \times \text{ANonApp}_c \times t \times 1\{c \in j\} \times 1\{d = USA\} \\
& + \gamma_3 \text{AApp}_p \times \text{AApp}_c \times t \times 1\{d = USA\} + \delta_{cpd} + \delta_{cdt} + \delta_{pdt} + \delta_{cpt} + \epsilon_{cpdt}
\end{aligned} \tag{4}$$

where all subscripts and variables are defined as earlier and d is a destination market, the US or the sum of EU and ROW. Relative to Equation (3), the differences here are in the additional destination dimension of the data used and in the fixed effects included, which are now country-HS 6-digit product-destination fixed effects δ_{cpd} – the panel dimension of the data set – as well as country-destination-year fixed effects δ_{cdt} and HS 6-digit product-destination-year fixed effects δ_{pdt} . The interpretation of the coefficients is now different since the control group relative to which effects of AGOA and GSP LDC are estimated is different, it now includes also exports by beneficiary countries and products to markets other than the market providing the preference. All coefficients are estimated based on *within* variation over time for a given country-product-destination. For example, the coefficient 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 EU and ROW market.

The results from estimating Equation (4) are shown in Table 6. Both columns show positive and significant impacts of AGOA apparel products as well as that of GSP LDC on exports to the US, relative to the exports of those countries and products to the EU and ROW. These results are additional evidence against the idea that the impacts of AGOA and GSP LDC on beneficiary African countries are purely driven by policy changes or other developments at the exporting country-product-year level.

Table 6. 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)
Time trend for ever GSP LDC Africa	-0.001 (-0.80)	
Time trend for ever GSP LDC Non-Africa	-0.005*** (-5.12)	
Time trend for ever AGOA Non-LDC	-0.001 (-0.93)	
Time trend for ever AGOA Non-apparel	0.006** (2.73)	
Time trend for ever AGOA apparel	0.008*** (4.85)	
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		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 Equation (4) shown. The estimating sample covers years 1992-2016 and excludes all 28 EU countries from the control group in all columns.

7.4 What Explains the Differences in the Impact of AGOA?

Our analysis shows that AGOA had a differential impact on apparel exports across African countries and sub-regions and sub-periods. While some African countries took advantage of the opportunities created by

the trade preferences offered by the US, others failed to do so, and the durability of the AGOA impact varied across sub-regions. It is therefore interesting to explore potential factors that may have contributed to such differential impacts. In their estimation of the early impacts of AGOA, Frazer and Van Biesebroeck (2010) found differential impacts of AGOA on apparel and non-apparel across African countries, but no meaningful correlations of those with measures of corruption, the rule of law, or import tariffs imposed by African countries.⁴⁵

To assess over a longer period the possible reasons for the heterogeneous response of African countries' apparel exports to trade preferences, we re-estimate Equation (3), allowing the main treatment variable (interaction term for the impact of AGOA on apparel) to enter by itself but also interacted with a range of policy, institutional, infrastructure, and endowment-related variables. Most of these variables, such as those reflecting the rule of law, proved to be insignificant and some even had counter-intuitive signs.⁴⁶ Table 7 reports our preferred estimates that include interactions with average tariffs imposed by African countries on their own imports, with the cost of starting a business, with internet access, and with oil rents (all variables being time-varying).⁴⁷ The estimates in column (1) show that countries with lower import tariffs benefit significantly more from AGOA. This result could reflect African apparel exporters' dependence on imported inputs and capital goods, and suggest that duty-drawback and other indirect mechanisms to exempt exporters from tariffs on intermediate inputs still impose additional transaction costs, 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. Column (3) indicates that access to the internet played an important positive role in explaining the differential impact of AGOA on apparel exports (which is consistent with results in Fernandes et al. (2018)). 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, which is consistent with a Dutch Disease effect.

⁴⁵ Coulibaly and Kassa (2018) show that higher trade creation impacts of AGOA can be explained by countries' ICT infrastructure, sound legal institutions and property rights protection and steady macroeconomic environment including stable exchange rates and low inflation. But their focus is on explaining country-year-varying impacts of AGOA on aggregate exports to the US, which is very different from the impacts of AGOA on exports of apparel and non-apparel groups of products to the US that we estimate.

⁴⁶ The results are not reported here for the sake of brevity, but they are available upon request.

⁴⁷ The tariff data are taken from Teti, Felbermayr, and Yalcin (2017), as explained in Appendix B. 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.

Table 7. 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)
GSP LDC * Africa	0.114*** (6.70)	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)
AGOA Non-LDC	0.028 (1.92)	0.020 (1.08)	0.020 (1.04)	0.025 (1.60)
AGOA Non-apparel	0.063 (1.74)	0.069 (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)
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)
Time trend for ever GSP LDC Africa	0.009*** (6.10)	0.009*** (5.84)	0.009*** (6.01)	0.009*** (6.12)
Time trend for ever GSP LDC Non-Africa	0.005*** (3.31)	0.005*** (3.31)	0.005*** (3.30)	0.005*** (3.32)
Time trend for ever AGOA Non-LDC	0.007*** (5.62)	0.007*** (5.50)	0.007*** (5.44)	0.007*** (5.45)
Time trend for ever AGOA Non-apparel	0.014*** (3.54)	0.015*** (3.57)	0.014** (3.15)	0.016*** (4.17)
Time trend for ever AGOA apparel	0.004 (1.60)	0.004 (1.45)	0.005 (1.53)	0.006* (2.05)
Country-product fixed effects	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes
Product-year fixed effects	Yes	Yes	Yes	Yes
Observations	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 Equation (3) with interactions with several variables shown.

To identify the factors that contributed to differences in short-term and long-term apparel export performance of African countries in response to AGOA, we re-estimate Equation (3) allowing the interaction between the main treatment variable and the four variables considered above to be different across two periods: 2001-2004 and 2005-2017. The results are presented in Table 8. The estimates suggest that the average tariff rate, the cost of starting a business and oil rents help explain differences in countries' ability to take advantage initially of preferences but access to the internet does not. However, variations in the ability to sustain export performance when preferences were eroded is related to average tariffs, oil rents, and access to the internet rather than the cost of starting a business.

Table 8: Impacts of AGOA on apparel and the role of domestic policy, institutions, infrastructure and endowments across sub-periods

	Data at country-HS 6-digit-year level (including zeros) is used			
	Dependent variable is log (US imports + 1)			
	(1)	(2)	(3)	(4)
GSP LDC * Africa	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)
AGOA Non-LDC	0.027 (1.83)	0.020 (1.07)	0.020 (1.04)	0.025 (1.59)
AGOA Non-apparel	0.063 (1.72)	0.068 (1.44)	0.091 (1.60)	0.042 (1.11)
AGOA apparel	0.408*** (5.14)	0.236*** (4.45)	0.143** (3.14)	0.233*** (5.38)
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 * 2001-20		-0.001*** (-3.32)		
AGOA apparel * Cost to start a business * 2005-20		-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)
Time trend for ever GSP LDC Africa	0.009*** (6.13)	0.009*** (5.85)	0.009*** (6.01)	0.009*** (6.12)
Time trend for ever GSP LDC Non-Africa	0.005*** (3.31)	0.005*** (3.31)	0.004*** (3.30)	0.005*** (3.32)
Time trend for ever AGOA Non-LDC	0.007*** (5.65)	0.007*** (5.49)	0.007*** (5.44)	0.007*** (5.46)
Time trend for ever AGOA Non-apparel	0.014*** (3.54)	0.016*** (3.57)	0.014** (3.15)	0.016*** (4.17)
Time trend for ever AGOA apparel	-0.000 (-0.16)	0.004 (1.32)	0.005 (1.54)	0.005* (1.98)
Country-product fixed effects	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes
Product-year fixed effects	Yes	Yes	Yes	Yes
Observations	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 Equation (3) with interactions with several variables shown.

We also explored the importance of a set of variables relating to exchange rate regimes and exchange rate overvaluation, but the results based on time-varying information were either weak or counter-intuitive. However, a simple correlation between the country-specific AGOA coefficients (not time-varying) and the exchange rate regime shown in Appendix Figure D2 suggests that the rigid regimes may be a possible reason for the dismal export performance of Central and West Africa in response to AGOA.

Of the other hard-to-measure factors that may have contributed to the differential impacts, the role of export processing zones (EPZs) may be particularly important. EPZs can be islands of improved policy, institutions and infrastructure which allow duty-free access to imported inputs, streamlined business regulation and improved connectivity. The number of EPZs in Africa has been growing over the last two

decades. While there is no comprehensive source of information on EPZs in Africa, Newman and Page (2017) identify 79 active Special Economic Zones (SEZs) as of 2016 – of which EPZs are the majority – in 46 African countries (52 of them in Kenya alone and 6 focused exclusively on apparel manufacturing). They argue that many of those SEZs began operations in the late 1990s or early 2000s, often precisely in response to AGOA and the MFA. Many of the SEZs have been established by Chinese firms in Nigeria, Ethiopia, Mauritius and Ghana (Zeng, 2015). But a large body of evidence reviewed in Farole (2011) suggests SEZs in Africa have largely under-performed. Some argue that this is largely due to the lack of the appropriate legal, infrastructural, and institutional frameworks required to attract potential investors (UNDP, 2015).

Farole (2011) argues that fully successful SEZ performance in Africa was seen only in Mauritius and to a smaller extent Kenya and Lesotho before 2005. His new data and case study evidence shows strong export performance of SEZs in Kenya and Lesotho, both of which benefited enormously from AGOA preferences in the US market in the period 2000-2004 (while competition from Asian producers was limited). But his analysis also suggests that the presence of SEZs in Kenya and Lesotho did not help to counteract these countries' declining export competitiveness in the US apparel market after the end of the MFA. Those SEZs experienced export stagnation and employment losses from 2005 to 2008 (when his analysis ends) although some in Kenya were able to subsequently and successfully diversify away from apparel.

The success of SEZs in Mauritius, Kenya, and Lesotho in the early post-AGOA years can help rationalize the boom-bust and boom-stagnation patterns observed in the raw export data and in the time profile of the estimated impacts of AGOA for those countries. Outside these success cases, the pessimistic view on SEZs in Africa is counteracted only by the recent SEZ growth in Ethiopia which has been concurrent with the late sustained success pattern observed in its raw export data and in the yearly impacts of AGOA for East Africa. The Growth and Transformation Plan guiding Ethiopia's recent development policy identifies EPZs as one of the means for industrialization (UNDP, 2015). The Government of Ethiopia introduced comprehensive laws and regulations on the establishment and management of EPZs. Moreover, the government has successfully engaged different partners in its EPZ agenda - obtaining financial and technical support from the World Bank and Chinese partners. Anecdotal evidence suggests that AGOA was a key factor for recent investments by foreign companies in Ethiopian EPZs (UNDP, 2015).

7.5 Evidence from firm-level data

We now consider the firm-level dynamics underpinning our findings on the impact of AGOA on apparel exports. To this end, we use customs transactions data for four African countries that represent a spectrum of apparel export experiences: Madagascar, boom-and-bust; Mauritius, boom-and-stagnation;

Kenya, fairly sustained growth; and Ethiopia, late take-off. In each case, we seek evidence of durable benefits of the preferential access to the US market offered by AGOA.⁴⁸

Mauritius is the only country for which customs transactions data are available for a period (2000-2016) that is sufficiently long to span all the major changes in US policy. Mauritius is also the only country which was subject to AGOA rules of origin (ROO) that changed over the period, from the restrictive double-transformation requirement (the use of African fabric made from U.S. or African yarn) to a more liberal single-transformation requirement (from fabric to garment in an AGOA eligible country). These changes in the ROO enable us to assess the implications of this vital condition for preferential access by distinguishing between four phases of preferential access for apparel exports to the US: (i) MFA quota free but not tariff free (2000-2001); (ii) MFA quota free and tariff free but subject to strict ROO (2001-2005); (iii) tariff free but strict ROO (2005-2009); and (iv) tariff free and liberal ROO (2009-2016).

To estimate the impacts of AGOA on exports of firms in Mauritius, we again employ a triple-differences specification that compares firm exports of eligible and non-eligible products from Mauritius (first difference) before and after AGOA (second difference) and across the US and the rest of the world (third difference) given by:

$$\log Exp_{ipdt} = \sum_{j=2001}^{2016} \beta_{1j} 1\{j = y\} \times AGOA_p \times PostAGOAAppearal \times 1\{d = USA\} + \beta_2 AGOA_p \times PostAGOANonAppearal \times 1\{d = USA\} + \delta_{ipd} + \delta_{td} + \delta_{tp} + \epsilon_{ipdt} \quad (5)$$

where the dependent variable is the log export value of product p (HS6) sold by firm i in year t in destination $d \in \{US, EU28, ROW\}$. The first term on the right-hand side is the triple interaction term of interest: the interaction 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 on the right-hand side is the triple interaction term for non-apparel products. Eq. (5) controls for firm-product-destination fixed effects δ_{ipd} , year-destination fixed effects δ_{td} , and product-year fixed effects δ_{tp} .

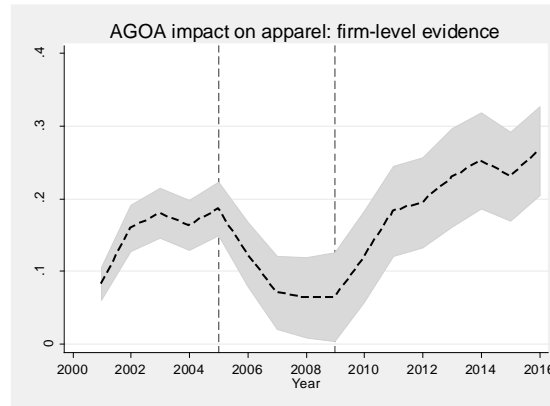
Figure 12 displays the point estimates for the triple-differences coefficient on apparel in each year, β_{1j} , along with their 95 percent confidence intervals.⁴⁹ The results suggest that Mauritian firms' apparel exports grew in phases (ii) and (iv) relative to exports in phase (i) and declined in phase (iii). This pattern suggests that Mauritius was only competitive in the US market when the difference between the preference margin and the additional cost of complying with the ROO was larger than some threshold level. Moreover, there is no sign that the AGOA preferences plus strict ROO in period (ii) equipped Mauritian firms to cope

⁴⁸ Details on the customs transaction data are provided in the Appendix.

⁴⁹ We find no significant effect on non-apparel products. The results are not reported here but they are available upon request.

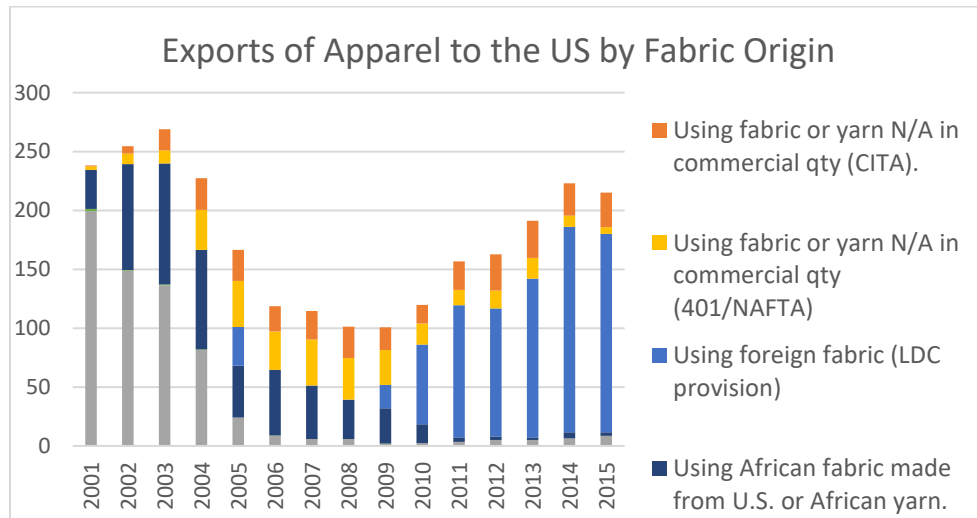
with international competition in period (iii) better than the firms in other Southern African countries that had to comply with relatively liberal ROO in period (ii). This finding is at odds with the suggestion in Rotunno, Vezina, and Wang (2013) that more stringent ROO would have led to greater local value added and more durable benefits. In fact, Mauritian exports only revived when ROO were relaxed in period (iv). 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 as shown in Figure 13.

Figure 12: 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 Equation (5).

Figure 13: Mauritius exports of apparel to the US by fabric origin



Source: US database on trade and market access.

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

The customs transactions data for Ethiopia, Kenya, and Madagascar are available only for periods after the major US trade policy changes. However, the decomposition of apparel export growth to the US

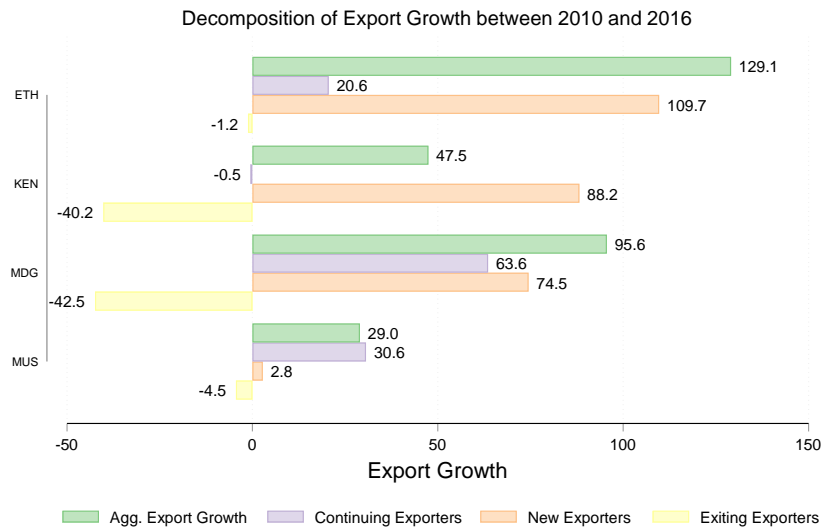
into intensive (within-firm for incumbent firms) and extensive (new firms and exiting firms) margins yields some insights into longer-term effects. Export growth along the intensive margin after trade preferences were reduced (by the end of the MFA quotas) would suggest that firms which benefitted from privileged access to foreign markets learned-by-doing or innovated and became internationally competitive. Export growth along the extensive margin would reflect improvements in domestic conditions which encouraged entry by new firms. Some of these domestic improvements, such as the creation of a pool of trained workers, could also be the result of earlier preferential access. We consider both apparel export growth decompositions in the short-run (year-to-year) shown in Appendix Figures E1-E4 as well as in the long-run (2010-2016) shown in Figure 14.

First, Madagascar and Kenya saw significant exit of apparel exporting firms between 2010 and 2016 (Figure 14). In Madagascar's case, the exodus was likely to have been sparked by the country's loss of AGOA privileges in 2009, evident in the apparel export trends presented in Appendix Figure C4. Clearly, the earlier period of AGOA preferential access did not create durable international competitiveness in apparel. In Kenya's case, the exit of firms was more likely to have been triggered by the global financial crisis of 2008-2009 and the ensuing sharp global contraction in trade.

Second, in Ethiopia and Kenya much of the apparel export growth to the US between 2010 and 2016 came from new exporters rather than from the expansion of exports by incumbent exporters. Ethiopian 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 the firms operating during this period enhanced their competitiveness, the end of the MFA and the global financial crisis seems to have wiped the slate clean by inducing significant exporter exit. The dominance of new exporters in recent Kenyan apparel export growth makes it hard to see any durable firm-level benefits which could be attributed to AGOA.

Third, in the case of Mauritius, there is little entry or exit of exporters over the 2010-2016 period and most of the apparel export growth is along the intensive margin. However, the overall performance of these exporters described above does not support the idea of international competitiveness in apparel being created due to preferential access. Similarly, the fact that in Madagascar there is some export growth along the intensive margin must be seen in the broader context of a significant decline in overall apparel exports.

Figure 14: 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 appendix.

The final piece of firm-level evidence comes from interviews we conducted with exporters in Ethiopia. Since AGOA was enacted in 2001 and apparel exports surged only a decade later, tariff preferences alone were clearly not sufficient to boost Ethiopian exports. However, interviews with enterprises in Ethiopia and testimonies of corporate executives (described in detail in Appendix E2) suggest that US tariff preferences played a crucial role in offsetting Ethiopia’s cost disadvantages due to lower labor productivity and higher logistics costs than in countries like Vietnam. The leading apparel companies said that they would not have set up their production plants in Ethiopia if AGOA preferences had not existed. 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 sign of internationally competitive firms which could survive without preferential access. In sum, the interviews suggest that preferences boosted export performance but have not yet led to durable competitiveness.

8. Conclusion: Trade preferences and comparative advantage

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 in that sector enable us to assess the durability of the impact of 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; the heterogenous effects across individual countries; and firm-level export dynamics in selected countries.

We found that the average impact of AGOA on apparel exports to the US of beneficiary countries 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 trade 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. More importantly, the decline demonstrates that export growth to the US market was not driven only 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. The raw data painted a contrasting picture over time: a rapid increase in exports over a first period (2001-2004), after the introduction of AGOA, while African countries enjoyed high preference margins over other countries, especially the quota-constrained Asian countries; and then a decline over a second period (2005-2017), after the end of the MFA, which led to an erosion in the preference margins. The results of the triple-differences regression, controlling for a wide range of other factors, revealed an increase in marginal impacts over the first period and then a leveling-off of marginal impacts over the second period.

Turning to the region- and country-level export performance revealed considerable heterogeneity behind the annual “average” performance over the two periods. Central and West Africa was 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 not significantly different from zero. East Africa presented the only example of a significant and growing positive marginal impact over both periods. However, this regional picture of East Africa is made up of interestingly different country-level 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 only in the second period. In fact, the illusion of sustained levels of exports at an Africa-wide and even regional level in the second period is created in part by these three late-bloomers in East Africa offsetting in part the decline in Southern Africa.

The firm-level 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 global financial crisis. The revival in Kenya’s exports after 2010 was mostly driven by new entrants rather than the firms that had benefited from big

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 incumbent firms whose international competitiveness might have been nurtured by earlier preferential access.

What does this evidence reveal about the impact of AGOA, its durability, 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 was not sufficient for export growth – favorable domestic conditions were necessary to benefit from access. 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. Nevertheless, the promising recent performance of Ethiopia, Rwanda, and Tanzania 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), and maintained competitive exchange rates through the choice of flexible exchange rate regimes. Further research is needed in this area.

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APPENDIX

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	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Botswana	X ¹	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Burkina Faso					X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Burundi						X	X	X	X	X	X	X	X	X	X		
Cameroon	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Cape Verde	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Cen African Rep	X ¹²	X ¹²	X ¹²														X ¹²
Chad	X	X	X	X	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Comoros								X	X	X	X	X	X	X	X	X	X
Congo (DROC)			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	X ¹²	X ¹²	X ¹²	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	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	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	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²			
Ghana	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	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	X
Kenya	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Lesotho	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X 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	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Madagascar	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²					X	X	X	X
Malawi	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Mali	X	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	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	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Mozambique	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Namibia	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Niger	X	X	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²		X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Nigeria	X	X	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Rwanda	X	X	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	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	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	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	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
South Africa	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
South Sudan													X	X			
Swaziland	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²			
Tanzania	X	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Togo								X	X	X	X	X	X	X	X	X	X
Uganda	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²
Zambia	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	X ¹²	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Benin	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Burundi	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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 ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X	X	X	X	X	X	X	X
Cen African Rep	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Chad	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Comoros	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Congo (DROC)	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Eq Guinea	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Guinea-Bissau	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Liberia												X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Madagascar	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Malawi	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Mali	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Mauritania				X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Sao Tome & Prin	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Senegal	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Somalia	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	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	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Togo	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Uganda	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹
Zambia	X	X	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	X ¹	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: WITS sectoral definition, SSA data and commodity prices

For the descriptive analysis in Sections 4 and 5, and the regression analysis in Section 7 we define three sectors following the WTO:

- Agriculture: SITC sections 0, 1, 4 and divisions 22,23,24,25,26, and 27;
- Mining: SITC section 3 and divisions 27, 28, and 68, as defined by the WTO. In addition, we also include division 97 (non-monetary gold) in Mining.
- Manufacturing: Sections 5, 6, 7, 8 minus division 68.

We drop from our data monetary gold (HS 710820) and other non-gold money and coins (HS 711810 and 711890).

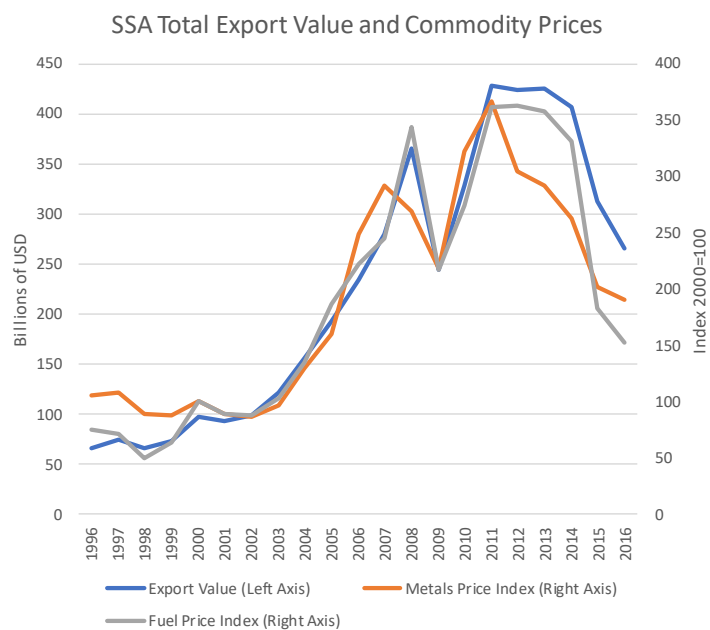
In the descriptive analysis in Section 4, we use WITS world import data as mirror data for SSA exports to lessen concerns of quality and consistency of Africa's export data. Within Africa, the value of imports can be affected due to missing import data in some years. Appendix Table B1 shows the first year that each African country reports in WITS and the years in which each country has missing export data. Reassuringly, for the two key years of our charts in Section 4, 2000 and 2016, there is a large number of countries with data in WITS including the two largest importers: Nigeria and South Africa.

Appendix Table B1. Countries with Missing Import Data in WITS

Country	First Year	Last Year	Missing Years
Angola	2007	2015	2008
Burkina Faso	1995	2016	2006
Congo (ROC)	1993	2014	1996,1997,1998,1999,2000,2001,2002,2003,2004,2005,2006
Ethiopia	1995	2016	1996
Gabon	1993	2009	1995
Ghana	1996	2016	2014,2015
Guinea	1995	2015	2003,2009,2010,2011,2012
Gambia	1995	2016	2015
Kenya	1992	2013	1993,1994,1995,1996,2011,2012
Lesotho	2000	2012	2005,2006,2007
Mali	1996	2016	2009,2013,2014,2015
Mauritania	2000	2016	2015
Malawi	1990	2015	1992,1993,1996,1997,1998
Nigeria	1996	2016	2004,2005,2015
Rwanda	1996	2016	2000
Sierra Leone	2000	2016	2001,2003,2004,2005,2006,2007,2008,2009,2010,2011,2012,2013
Seychelles	1994	2016	2009
Togo	1994	2016	2006
Zimbabwe	1995	2016	1996,1997,1998,1999,2000,2003

In the regression analysis in Section 7, we use the average MFN import tariff imposed by each AGOA country. The tariffs are taken from a newly constructed database by Teti, Felbermayr, and Yalcin (2017), which is based on the TRAINS and IDB databases. The database addresses the missing MFN tariffs by setting equal to the nearest preceding observation and the nearest succeeding observation when there is no preceding observation. However, for some countries, the MFN tariffs are still missing after these procedures. For these countries, we replace the missing MFN tariff by linearly interpolating observations based on the World Bank's WITS database.

Appendix Figure B1. Total exports of African countries and commodities' price indexes

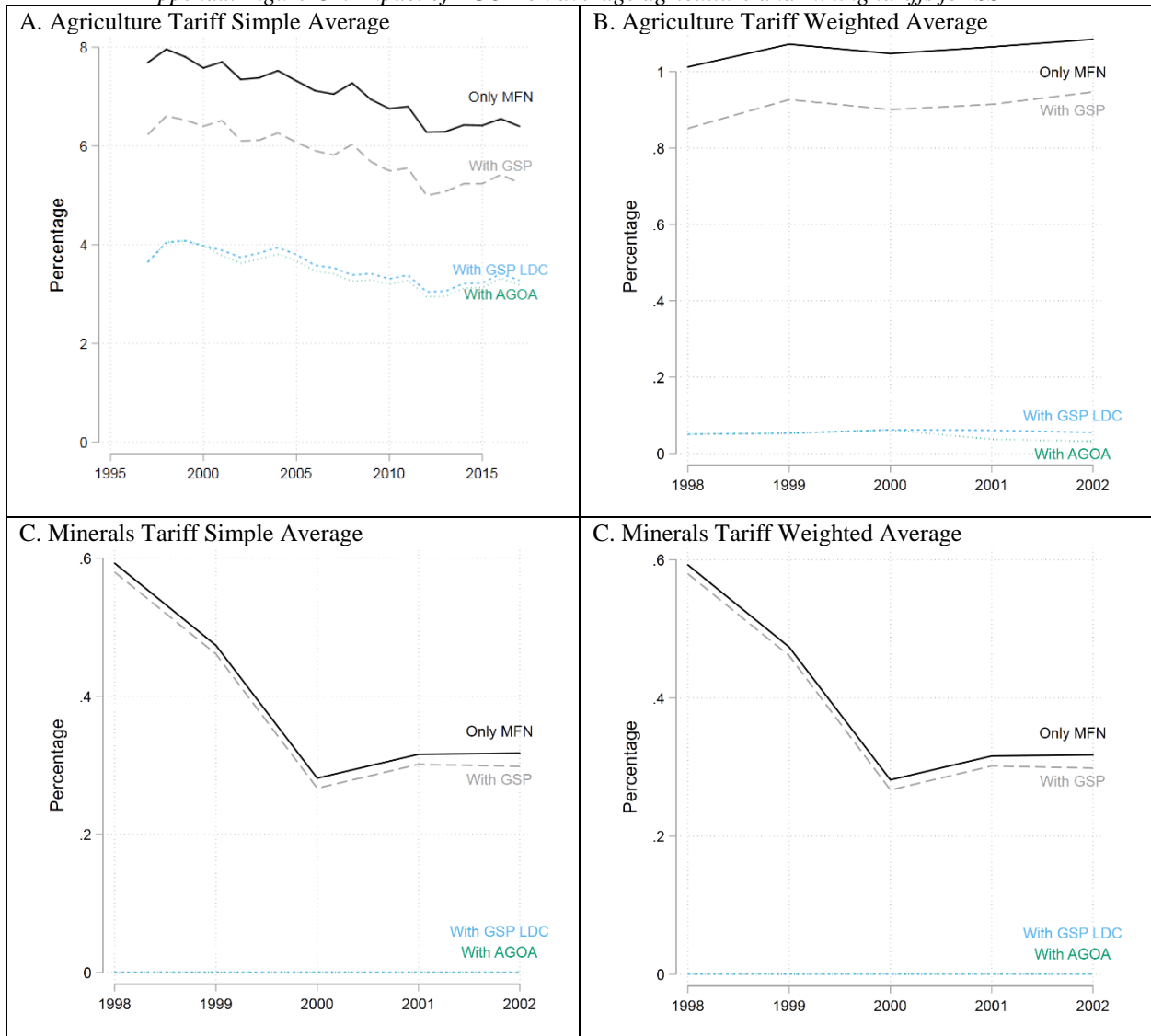


Source: WITS and IMF Primary Commodity Prices.

Note: Sub-Saharan African exports are measured by the world imports from Sub-Saharan countries in WITS.

Appendix C: Agriculture and mining tariff declines, preference utilization under AGOA, and additional countries in the four stories of apparel exports

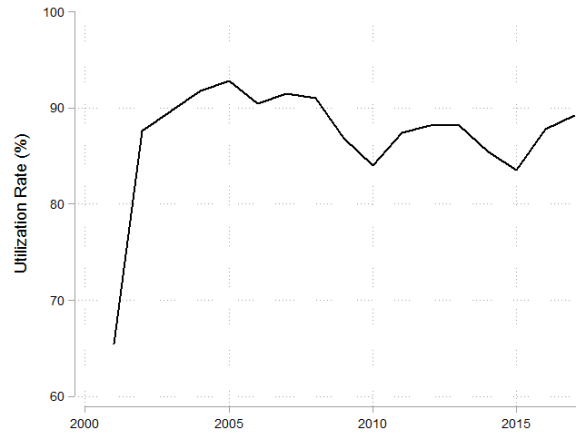
Appendix Figure C1. Impact of AGOA on average agriculture and mining tariffs for SSA



Source: US database on trade and market access.

Notes: simple average tariffs include all 8-digit tariff lines of the US Trade Schedule (HTS) for each year. Ad-valorem equivalents are calculated for tariffs with specific components (tariff lines with complex tariffs are not included). Trade-weighted average tariffs use total SSA exports to the US in 2000 as weights. Number of products per sector in 2001 HTS.

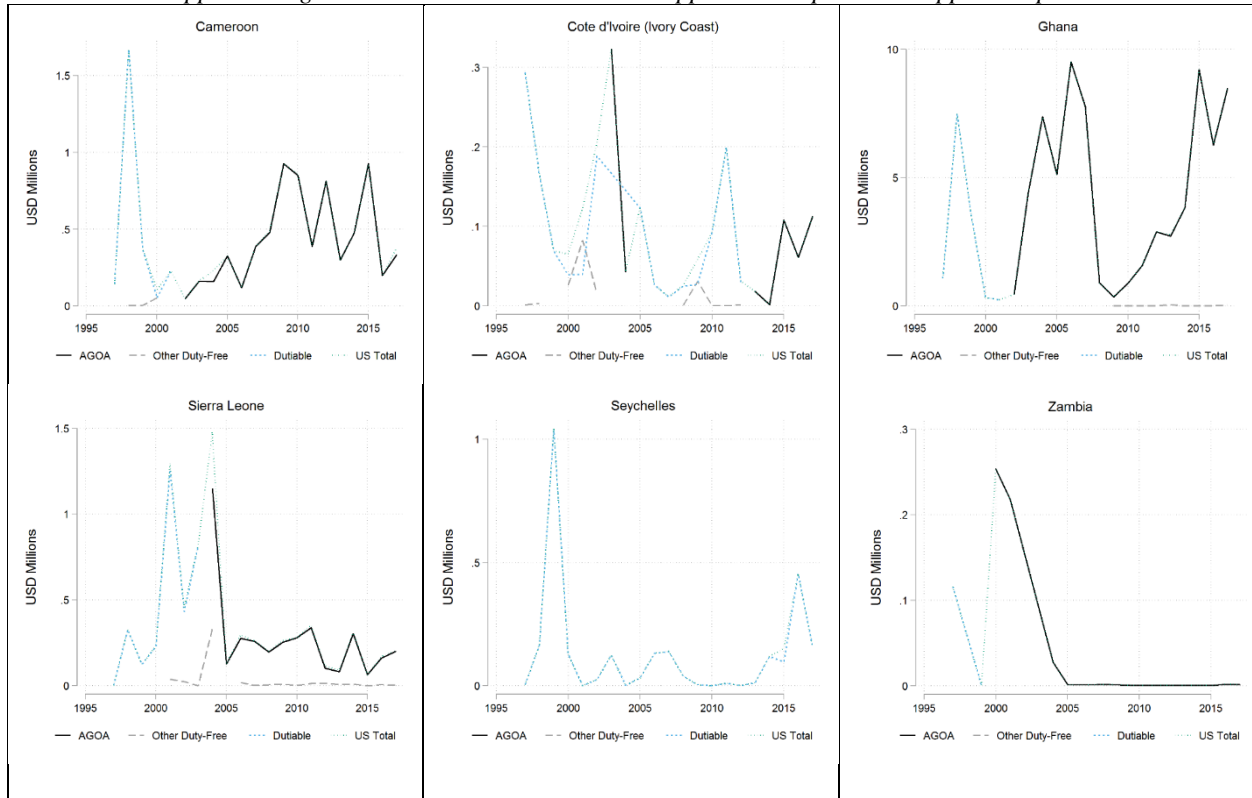
Appendix Figure C2. AGOA Preference Utilization



Source: US database on trade and market access.

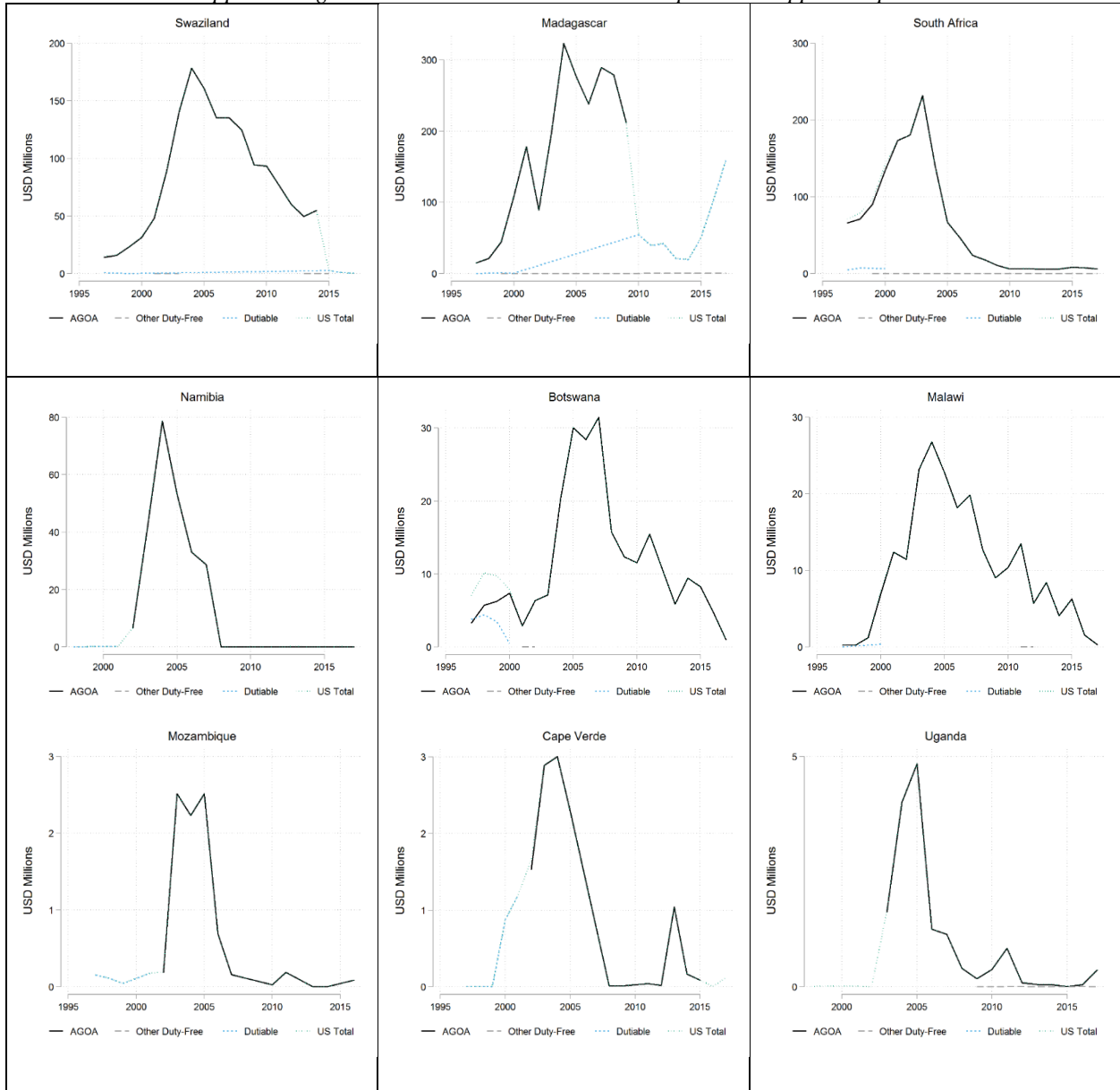
Notes: the utilization rate is defined as the share of dutiable preference-eligible imports that enter the US (originating in SSA countries) using AGOA. Imports entering under different duty-free eligible programs are excluded from the calculation.

Appendix Figure C3. Countries with a missed opportunities pattern in apparel exports



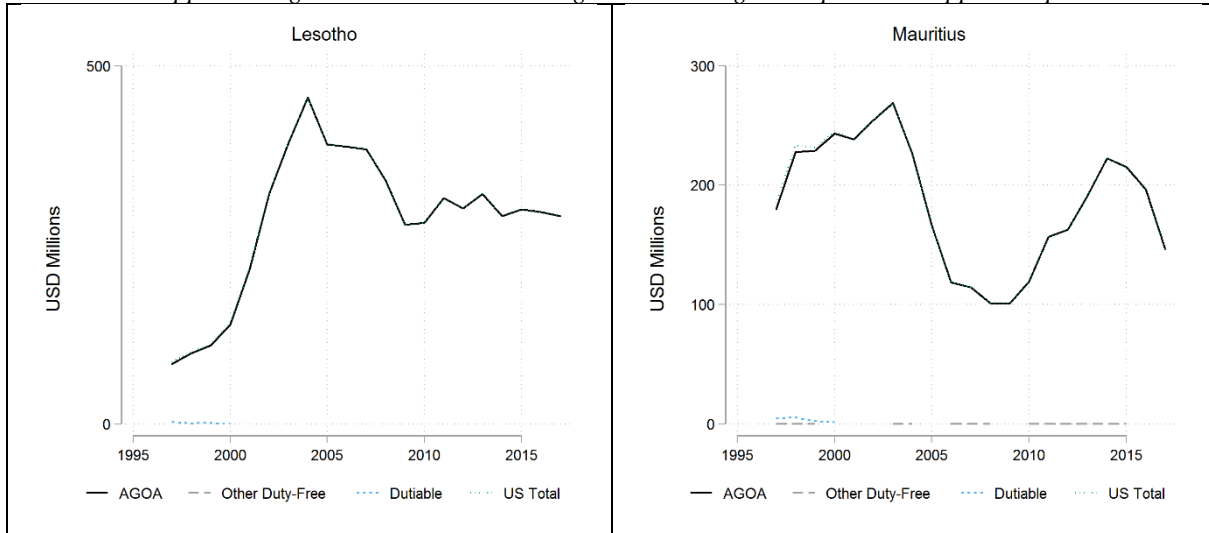
Source: US database on trade and market access.

Appendix Figure C4. Countries with a boom-bust pattern in apparel exports



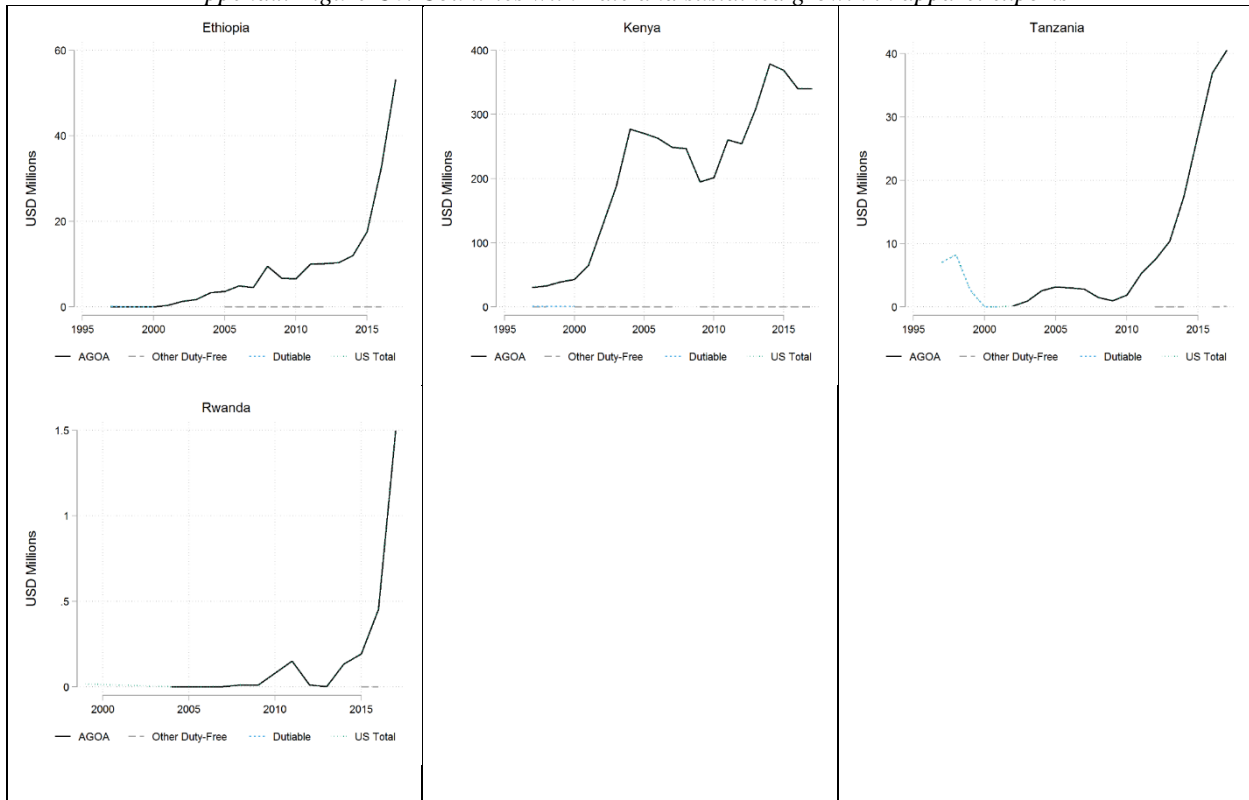
Source: US database on trade and market access.

Appendix Figure C5. Countries with a growth and stagnation pattern in apparel exports



Source: US database on trade and market access.

Appendix Figure C6. Countries with Late and sustained growth in apparel exports



Source: US database on trade and market access.

Appendix D: Additional regression results

Appendix Table D1. 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)
Time trend for ever GSP LDC Africa	0.009*** (6.12)	0.010*** (8.55)
Time trend for ever GSP LDC Non-Africa	0.005*** (3.31)	0.010*** (4.80)
Time trend for ever AGOA Non-LDC	0.007*** (5.60)	0.010*** (6.49)
Time trend for ever AGOA Non-apparel	0.014*** (3.55)	0.001*** (3.73)
Time trend for ever AGOA apparel	0.006* (2.20)	0.000 (-0.61)
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 Equation **Error! Reference source not found.** allowing for separate coefficients for agriculture, manufacturing, and mining sub-sectors shown.

As an alternative to Equation (3), 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:

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

(D1)

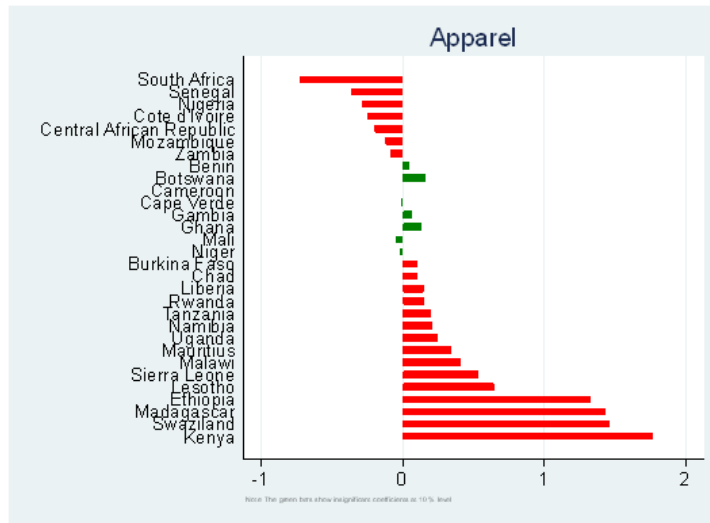
where $\tau_{cpt}^{MFN} - \tau_{cpt}^{Pref}$ is the difference between the MFN tariff rate and the best available US preferential tariff rate. As in Equation (3) we control for a stringent set of fixed effects: country-product, country-year, and product-year. Since Equation (D1) relies on a continuous 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 D2. Impacts of US preference margins

	Data at country-HS 6-digit-year level (including zeros) is used		
	Dependent variable is:		
	Log (imports + 1) (1)	Log (imports + 1) (2)	Log (imports + 1) (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

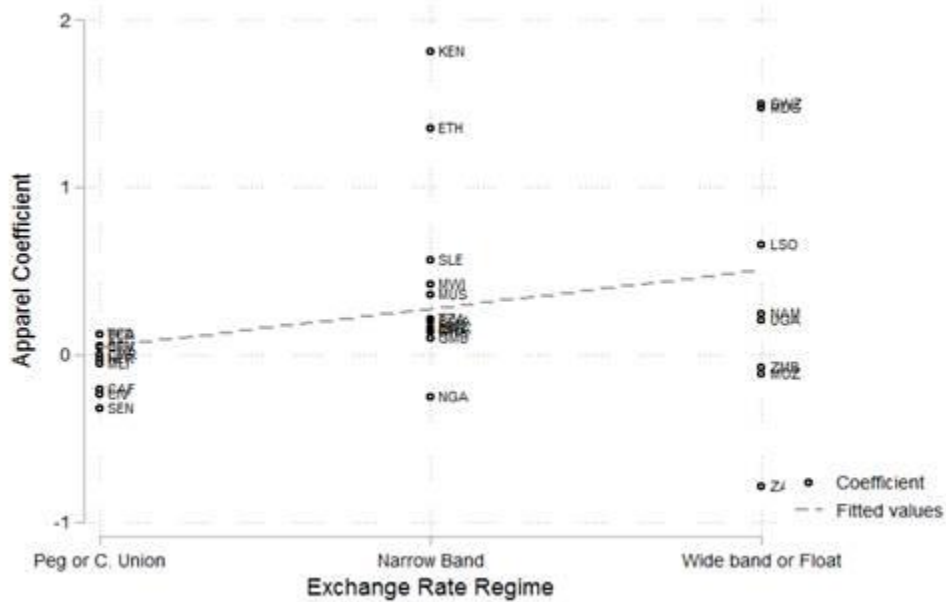
Notes: Robust t-statistics in parentheses, clustered by HS 6-digit product. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. Estimates for Equation D1 are shown.

Appendix Figure D1. 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 Equation (3) allowing for separate coefficients for each African country.

Appendix Figure D2. Baseline impacts of AGOA on apparel by country and exchange rate regime



Note: figure shows coefficients on AGOA apparel separately estimated for each country (displayed in Appendix Figure D1).

Appendix E. Firm-level analysis

E1) Customs transaction data

Our analysis makes use of exporter-level data from customs for Ethiopia, Kenya, Madagascar and Mauritius. These data were collected in the context of the Exporter Dynamics Database described in Fernandes et al. (2016). Each country's data set 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 E1. 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	

E2) 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.

E3) Export growth decomposition

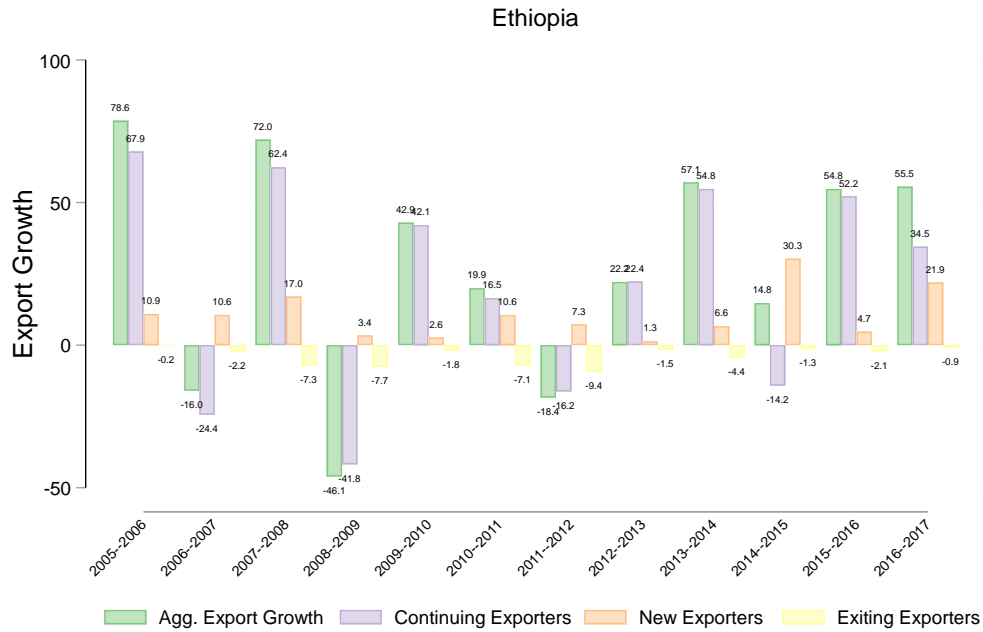
To understand the sources of aggregate growth, we decompose the change in each country’s exports to the US between year $t-k$ and year t , ΔE_t into the change due to increases or decreases in exports at the existing exporting firms (i.e., intensive margin), the increase due to entry of new exporting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

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

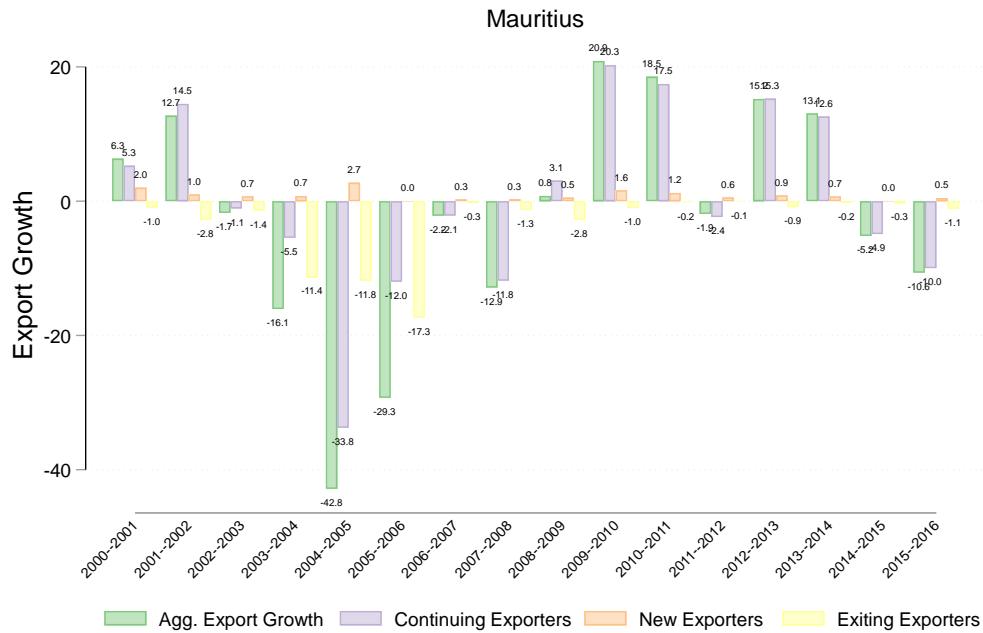
where ΔE_t is the change in country’s export between year $t-k$ and year t , C is the set of continuing exporters that are active in export markets in both $t-k$ and t , E is the set of entering exporters that are active in export markets in t but not in $t-k$, and X is the set of exiting exporters that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

E4) Results from short-run (year-to-year) apparel export growth decompositions for each country

Appendix Figure E1. Apparel export growth decomposition for Ethiopia



Appendix Figure E2. Apparel export growth decomposition for Mauritius



Appendix Figure E3. Apparel export growth decomposition for Kenya



Appendix Figure E4. Apparel export growth decomposition for Madagascar

