

# TRADE GROWTH UNDER THE AFRICAN GROWTH AND OPPORTUNITY ACT

Garth Frazer and Johannes Van Biesebroeck\*

*Abstract*—This paper investigates whether one of the most important U.S. policies toward Africa of the past few decades achieved its desired result. In 2000, the United States dropped trade restrictions on a broad list of products through the African Growth and Opportunity Act (AGOA). Since the act was applied selectively to both countries and products, we can estimate the impact with a triple difference-in-differences estimation, controlling for both country and product-level import surges at the time of onset. This approach allows us to better address the endogeneity-of-policy critique of standard difference-in-differences estimation than if either a country- or a product-level analysis was performed separately. Despite the fact that the AGOA product list was chosen to not include import-sensitive products and despite the general challenges of transaction costs in African countries, we find that AGOA had a large and robust impact on apparel imports into the United States, as well as on the agricultural and manufactured products covered by AGOA. These import responses grew over time and were the largest in product categories where the tariffs removed were large. AGOA did not result in a decrease in exports to Europe in these product categories, suggesting that the AGOA exports were not merely diverted from other destinations. We discuss how the effects vary across countries and the implications of these findings for aggregate export volumes.

## I. Introduction

THE overwhelming challenge in improving the human condition today is the challenge of development on the African continent. One of many factors cited for inhibiting the development of Africa and other low-income countries has been the trade barriers imposed by high-income countries on the imports of commodities in which poor countries are likely to have a comparative advantage: textiles and agricultural products in particular. This paper explores whether these trade barriers have actually mattered. Where they have been removed, have exports from Africa increased?

The paper takes advantage of the unilateral granting of trade concessions to the majority of sub-Saharan African countries by the United States in the form of the African Growth and Opportunity Act (AGOA, 2000). These trade concessions were uniform across all countries eligible for AGOA, but differ for apparel and nonapparel items.<sup>1</sup> While

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\* Frazer: University of Toronto; Van Biesebroeck: K. U. Leuven, NBER, and CEPR.

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<sup>1</sup> The main criteria for AGOA eligibility to a basic level of political and democratic freedom within the country. Countries excluded from AGOA as of January 2, 2008, were: Zimbabwe, Cote d'Ivoire, Somalia, Sudan,

the products allowed duty-free and quota-free access were uniform across eligible countries, the set of products was not comprehensive. AGOA applied selectively to both countries and products, but not to all countries or all products. As a result, we can estimate the impact of the policy using triple difference-in-differences, which is more robust to the endogeneity critique that applies to regular difference-in-difference estimation (Besley & Case, 2000).

To examine the benefits of triple-difference estimates, consider how the endogeneity critique would apply if either a country- or a product-level analysis was performed separately. At the country level, suppose that a country was granted AGOA eligibility just as its economy started to improve, for example, when the normal state of affairs is restored after a civil war. An increase in U.S. imports from this country could coincide with AGOA taking effect, even though the increase merely reflects the overall boost in the exporter's economy.<sup>2</sup> The country-by-country difference-in-differences estimator would erroneously attribute the positive export effect to AGOA. At the product level, suppose that the United States granted AGOA product status to those products for which its demand was expected to increase.<sup>3</sup> Here again, a product-by-product difference-in-differences estimator would attribute a positive effect to AGOA if the general import surge for eligible products merely extended to countries included in the act.

We will address these critiques. The increase in U.S. imports of a specific AGOA-eligible product from an AGOA-eligible country during the AGOA period will be measured relative to the overall increase in imports from that country, the overall increase in imports of that product, and the base level of imports of AGOA products from AGOA countries. In fact, the preferred specification will be even more general than this, allowing a full set of country-product, country-year, and product-year fixed effects.

While this product and country variation in eligibility clearly is an advantage to isolate the impact of AGOA, it also has its limitations. In particular, the U.S. administration could choose to implement tariff concessions on products that African countries would have little hope of exporting (e.g., because of a lack of comparative advantage). The AGOA legislation explicitly allows the president only to grant duty-free treatment for nonapparel articles "after the U.S. Trade Representative and the U.S. International Trade Commission have determined that the article is not import

Central African Republic, Eritrea, Comoros, Equatorial Guinea, Mayotte, and Togo.

<sup>2</sup> In practice, there was some variation across countries in eligibility date, especially for the apparel provision.

<sup>3</sup> To preview the results, U.S. worldwide imports of oil (a product given duty-free access under AGOA) were considerably higher after AGOA.

sensitive when imported from African countries,” which suggests that such selective implementation was indeed possible.<sup>4</sup> The effect of such selective tariff concessions will differ from a widespread free trade agreement. For this reason, it is not self-evident that one would find positive effects from AGOA, and finding no effect in this case cannot be interpreted more generally as no effect from broad trade liberalization.

A second reason not to expect large effects from AGOA is that many have argued that trade restrictions are not the primary constraint on African exports. For example, Collier and Gunning (1999) identify the chief factors explaining Africa’s poor economic performance as distorted product and credit markets, high risk, inadequate social capital, inadequate infrastructure, and poor public services. External factors such as developed countries’ trade restrictions are not considered as important. The internal factors may continue to constrain African exports after the removal of the U.S. import restrictions. AGOA was expected to be particularly important for apparel exports. However, it is not obvious that the quota removal would matter, as almost no eligible countries had apparel quotas for imports into the United States.

We find that AGOA had a large and robust impact on imports into the United States, especially for apparel, but also for manufactured products, and a smaller but significant impact of agricultural products. These import responses grew over time and were the largest in product categories where the tariffs removed were large. AGOA did not result in a decrease in exports to Europe in these product categories, suggesting that the U.S.-AGOA imports were not merely diverted from elsewhere. When we estimate country-specific impacts, we find a broad-based export response, particular for manufactured products. We also find that countries with high corruption or poor rule of law were equally able to take advantage of AGOA as countries with low corruption and better institutions.

Finally, one reason that the impact of AGOA on apparel exports was expected to be limited or short-lived was the phase-out of the Multi-Fibre Arrangement (MFA) on January 1, 2005. At this point, import quotas for apparel imports were eliminated for competing developing countries as well. Newspapers predicted that most apparel production would shift to China.<sup>5</sup> In addition, several studies predicted that Chinese and other Asian competition would overwhelm the less efficient African producers and seriously damage African apparel exports to the United States after this point (Harrison, Rutherford, & Tarr, 1997; Lall, 2005; Cling, Razafindrakoto, & Roubaud, 2005; Nordås, 2004; Rivera, Agama, & Dean, 2003; Mattoo, Roy, & Subramanian, 2003;

Gibbon, 2003). Our analysis extends to 2006, and, perhaps surprisingly, we find that AGOA had the largest effect on apparel exports in the last two years of the sample.

The importance of African development has led to a variety of policy statements and initiatives, including the New Partnership for Africa’s Development and debt relief. AGOA was such an effort—in this case, a unilateral effort of the U.S. administration under President Clinton, which was renewed by the Bush administration and remains in effect under President Obama. This paper evaluates whether this initiative had any impact. The remainder of the paper is organized as follows. Section II gives background information on the U.S. system of trade preferences and discusses the relevant literature. Details on the implementation of the act are in section III. The empirical specification is introduced in section IV and the data in section V. Results are in section VI. Implications of the results are discussed in section VII, and section VIII concludes.

## II. Literature Review

Other studies that have explored the impact of expanded trade preferences (like AGOA) or free trade agreements have reached varying conclusions.<sup>6</sup> In the African context, Carrère (2004) examines the impact of the five major African regional trade agreements and two major currency unions in Africa over the period 1962 through 1996 and finds that they increased trade among members.

Here, we evaluate the impact of nonreciprocal trade preferences. One might expect a smaller effect on trade, as the United States did not obtain anything in exchange for its concessions, and the law required that the items included on the AGOA list not be import sensitive. The major preference regime offered by most developed countries to imports from developing countries is the Generalized System of Preferences (GSP): the rule for eligibility is typically set by an income threshold. Rose (2004) finds a significant effect of the GSP on trade volumes, but an insignificant effect of the GATT/WTO. Romalis (2003) finds in addition that GDP growth rates of countries most affected by the establishment of the GSP increased significantly. AGOA involves the addition of a large number of products to the U.S. version of the list of products that are offered duty-free access.

Hoekman, Ng, and Olarreaga (2002) estimate the potential effect on exports from least developed countries (LDCs) of the removal of tariffs on high-tariff items (above 15%) in the United States, Japan, Europe, and Canada at 11% of total exports. Ianchovichina, Mattoo, and Olarreaga (2001) estimate the potential impact of preferential market access for a set of 37 sub-Saharan African countries to the same

<sup>4</sup> The quotation is taken from a summary of the AGOA legislation at <http://www.agoa.gov>.

<sup>5</sup> There are hundreds of newspaper articles on this issue. See, for example, *Business Week* (2003) for a U.S. perspective, and *Business Day* (2004) for a South African perspective.

<sup>6</sup> For example, Romalis (2007), Trefler (2004), Burfisher, Robinson, and Thierfelder (2001), Clausing (2001), and Head and Ries (1997) examine the North American Free Trade Agreement or the Canada-U.S. Free Trade Agreement. Greaney (2001) examines U.S.-Japan bilateral trade agreements, and Frankel, Stein, and Wei (1995) examine the impact of regional trading blocs.

countries and predict that African exports would increase considerably, by approximately 14%. In contrast, the products newly added to the GSP list under AGOA had an average tariff rate of only 4.1%, and the expected impact is likely to be much smaller.<sup>7</sup>

Several other papers have suggested that the impact of AGOA could well be very limited. Collier and Gunning (1999) do not consider developed-country tariffs significant impediments to growth in Africa. Limão and Venables (2001) find that the relatively low level of African trade flows “is largely due to poor infrastructure” (p. 451). Rodrik (1998) studies the possible causes of poor export performance in Africa and suggests that the dominant causes are low levels of per capita income, small country size, poor geography, and domestic (African) trade policy. Morrissey (2005) notes that “there are many explanations as to why the export response to trade liberalization in SSA has been limited” (p. 1145), and he highlights a few, including transport costs and natural barriers to trade. Wang and Winters (1998), in summarizing a set of World Bank technical papers, find that “the evidence suggests that it is African countries’ own trade policies and not those of their partners that must be changed in order to promote growth,” a view echoed by Yeats et al. (1996).

In one instance where an African country has liberalized its trade policy, in Uganda, it has not immediately led to expanded exports (see Morrissey & Rudaheranwa, 1998). Specifically, they find that despite significant liberalization on imports and the foreign exchange market, and the abolition of export taxes, export earnings did not increase. Milner, Morrissey, and Rudaheranwa (2000) offer a partial explanation, as they find that for Uganda, even after export taxes are abolished, transport costs remain a significant constraint on trade. Overall, then, AGOA might not have (much of) an impact in the African context for a number of reasons.

To our knowledge, Mattoo et al. (2003), Gibbon (2003), and Brenton and Ikezuki (2004) are the only other studies of the impact of AGOA. Mattoo et al. (2003) predicted the effects ex ante using information on pre-AGOA tariffs and assumptions on supply responses. Their conservative estimate was that AGOA would raise Africa’s nonoil exports by 8% to 11%. For a country like Mauritius, they expected exports to rise by only 5% from 2001 to 2004. Absent the rules-of-origin requirements on yarn, which Mauritius turned out to be exempt from, an export increase of 36% was expected. For a lesser developed country such as Madagascar, they assumed a five times higher (export) supply response and predicted an export increase for textiles of 92%.

Gibbon (2003) analyzes the initial AGOA response (in 2002) in the South African apparel sector from a global commodity chain and global value chain perspective to study what kind of enterprises could take advantage of AGOA.

<sup>7</sup> The tariff rate is measured as an average of the ad valorem tariff rate and the ad valorem equivalent for specific tariffs.

Brenton and Ikezuki (2004) advocate the renewal of the unrestricted fabric-sourcing rules that were set to expire at the time of their writing—which did happen. Using data up to 2002, they show increased exports of AGOA-eligible products for some countries, but they also provide suggestive evidence that the rules-of-origin requirements depressed exports and lead to underutilization of existing preferences.

### III. The Implementation of AGOA

When the AGOA was implemented on October 2, 2000, it applied to 34 countries in sub-Saharan Africa. By January 2, 2008, 8 more countries had been added to the list, often after government stability was achieved, such as in Sierra Leone. Four countries—the Central African Republic, Eritrea, Côte d’Ivoire, and Mauritania—have been removed from AGOA as a result of failures regarding political or democratic freedoms.<sup>8</sup>

The act allows duty-free imports under two broad categories: apparel and nonapparel. For nonapparel, approximately 1,800 items were added to the list of products with zero import duty under the GSP. As a result, for AGOA countries the number of goods on the U.S. GSP list expanded from 4,600 to more than 6,400 items, defined at the eight-digit HS (harmonized system) level. We will refer to these newly added items as *GSP products* for brevity. As soon as a country is declared AGOA eligible, it can export any of these items duty free to the United States.<sup>9</sup>

Duty-free access for apparel exports from an African country is not automatic as soon as AGOA eligibility is granted. The first countries to be declared eligible for the apparel provision were Kenya and Mauritius on January 18, 2001, three months after most countries were admitted to AGOA. Countries have been admitted to the apparel provision at various times over the subsequent years. The apparel provision allows duty-free and quota-free access to the U.S. market for most apparel products, provided that the fabric (or yarn or thread) comes from either the United States or an AGOA country. While the country-level quotas have been removed, a regional (AGOA) quota remains for apparel that was initially set at 1.5% of U.S. imports, increasing to 3.5% over an eight-year period. These caps were doubled under a set of amendments, AGOA II, and the new set of caps has not proved binding.

<sup>8</sup> The Central African Republic (January 1, 2004) and Mauritania (January 1, 2007) were removed after coups, although Mauritania rejoined later that year. Eritrea (January 1, 2004) was removed after failing to implement elections and democratic reforms. Côte d’Ivoire (January 1, 2005) was removed after failing to implement a peace plan.

<sup>9</sup> For some of the least developed beneficiary countries, the pre-AGOA GSP list already contained a number of the products added to the GSP list for all AGOA countries by the act. We follow the more conservative approach of including these product-country pairs as treated under AGOA. The alternative approach—treating these product-country pairs as unaffected by AGOA—increases the point estimates of the AGOA effect by approximately one-quarter. Also, some agricultural products subject to tariff rate quotas remained subject to out-of-quota duties.

In addition to the governance provisions required for general admission to AGOA, countries seeking access to the apparel provision must prove that they have an effective visa system to verify and enforce the source of the fabric or yarn used in apparel production. Once countries qualify for the apparel provision, they can also be considered for the special rule for apparel. This special rule was designed to apply to lesser developed AGOA countries and allowed them to source their fabric or yarn from anywhere in the world.<sup>10</sup> During our study period, South Africa was the only country of the 27 ever eligible for the apparel provision that did not qualify for the special rule (either by rule or exception granted).

#### IV. Empirical Specification

We will estimate the impact of AGOA on the volume of African exports to the United States. Any of the standard trade models would predict that if these concessions were applied to products that African countries were either already exporting or to products that they should export given their comparative advantage or factor endowments, then the volume of these exports would increase. No formal model is presented, as this prediction would apply to a wide class of models indeed.

The simplest (but most restrictive) triple-difference regression specification to measure the size of the AGOA effect is the following:

$$\begin{aligned} \ln IMP_{cpt} = & (\alpha_1 + \beta_1 Ineffect_t) \times AGOA\_country_c \\ & \times AGOA\_product_p \\ & + (\alpha_2 + \alpha_3 Ineffect_t) \\ & \times AGOA\_country_c \\ & + (\alpha_4 + \alpha_5 Ineffect_t) \\ & \times AGOA\_product_p \\ & + \alpha_6 Ineffect_t + \epsilon_{cpt}, \end{aligned} \quad (1)$$

where the variables are defined as follows. The left-hand-side variable refers to the U.S. imports of product  $p$  from country  $c$  during period  $t$ . Since this paper is measuring the impact of a U.S. policy, all trade volumes will be imports into the United States, as reported by the United States. The variable  $AGOA\_country_c$  is a time-invariant dummy that takes a value of 1 if a country is ever declared AGOA eligible. Similarly, the variable  $AGOA\_product_p$  is a time-invariant dummy that takes a value of 1 for products eligible for duty-free import under the act. The  $Ineffect_t$  variable is a dummy that switched from 0 to 1—for all countries and products—in 2001, when AGOA took effect.<sup>11</sup>

The intuition behind this specification can best be seen when only two years are considered: one year prior to

AGOA, say 1999, and a second year when AGOA is in effect for some countries and products, say 2003. The implementation of AGOA contains variation along three dimensions: (a) between time periods (pre and post), (b) between products, and (c) between countries. Therefore, if we define  $AP$  and  $AC$  as an AGOA product and an AGOA country and  $NP$  and  $NC$  as a non-AGOA product and country, respectively, the triple difference (DDD) used to measure the effect of the act is:

$$\begin{aligned} DDD = & \underbrace{((\ln IMP_{03}^{AC,AP} - \ln IMP_{99}^{AC,AP}) \\ & - (\ln IMP_{03}^{AC,NP} - \ln IMP_{99}^{AC,NP}))}_{AGOA\ Country - DD} \\ & - \underbrace{((\ln IMP_{03}^{NC,AP} - \ln IMP_{99}^{NC,AP}) \\ & - (\ln IMP_{03}^{NC,NP} - \ln IMP_{99}^{NC,NP}))}_{Non-AGOA\ Country - DD}. \end{aligned} \quad (2)$$

The standard difference-in-differences approach, used, for example, when measuring the effect of tariff preference given to a single country, is the first difference-in-differences (DD) term, labeled *AGOA Country—DD*. This measures the difference between AGOA and non-AGOA products in the pre-post import differences within an AGOA country. Implicitly, the AGOA products are the treatment group and the non-AGOA products the control group of the first DD experiment. By comparing this first difference-in-differences within the AGOA country to the equivalent difference-in-differences in a non-AGOA country (the second term), we can control for product-specific trends that are common to treated (AGOA) and untreated countries.

The simplest way of expressing the triple difference in (2) in regression form is to regress imports on three dummy variables: one for each difference ( $Ineffect_t$ ,  $AGOA\_product_p$ , and  $AGOA\_country_c$ ), as well as the three double interactions of these variables and the single triple interaction. This is exactly the specification of (1), where the coefficient on the triple interaction measures the AGOA effect. However, this specification is very restrictive. All country-product combinations are lumped in four exclusive groups: eligible products from AGOA countries, on the one hand, and from non-AGOA countries, on the other, and ineligible products from either group of countries. Each group is restricted to have a single base level of imports. In addition, the post-AGOA surge in U.S. imports is assumed to be the same for all AGOA countries and for all eligible products.

Relaxing these assumptions, our preferred, entirely unrestricted, specification is

$$\begin{aligned} \ln IMP_{cpt} = & \beta_1 Ineffect_t \times AGOA\_country_c \\ & \times AGOA\_product_p + country/product_{cp} \\ & + country/year_{ct} + product/year_{pt} + \epsilon_{cpt}. \end{aligned} \quad (3)$$

<sup>10</sup> The rule is defined as having a per capita GNP below \$1,500 in 1998 as measured by the World Bank.

<sup>11</sup> The effect of the act truly did not begin until 2001, as the president did not announce (and make official) the list of AGOA-GSP products until December 21, 2000.

The only coefficient estimated (aside from all the fixed effects) is the one of interest: that on the triple interaction ( $Ineffect_t \times AGOA\_country \times AGOA\_product$ ). The double-interaction terms of (1) are replaced with three sets of interactive fixed effects, which allow for heterogeneity in (a) the base level of imports of any product from any country ( $country/prod_{cp}$ ), (b) the overall imports from any country into the United States in any year ( $country/year_{ct}$ ), and (c) the overall imports of any product into the United States in any year ( $product/year_{pt}$ ). Including these double-interaction fixed effects obviates the need for the uninteracted variables as well.<sup>12</sup> For comparison purposes, we also estimated more restrictive specifications, including that of (1).

Two further issues complicate the analysis. Apparel products are treated differently from other products that fall under the act. It would be implausibly restrictive to constrain the effects to be of the same magnitudes for both groups of products.<sup>13</sup> We therefore include the triple-interaction term twice: once for nonapparel products added to the GSP list under AGOA ( $GSP$ )<sup>14</sup> and once for apparel products ( $APP$ ). Two time-invariant product dummies are used:  $GSP\_product_p$  and  $APP\_product_p$ . Two time-invariant country dummies distinguish between countries that at any point in time fall under the act ( $GSP\_country_c$ ) and the subset of these countries that at some point were additionally declared eligible for the apparel provision ( $APP\_country_c$ ).

Second, while for GSP products, the act came into effect at approximately the same time for the vast majority of countries, this is not the case for the apparel provision. In order to account for the additional time variation in country eligibility, the timing of the two  $Ineffect_t$  variables used in the interaction terms will be country specific as well:  $Ineffect\_GSP_{ct}$  and  $Ineffect\_APP_{ct}$ . To measure the effect of AGOA on import growth for eligible products in eligible countries—the triple interaction term—the actual time the act has been in effect in each country is taken into account.

The full specification for the benchmark estimation is given by

$$\begin{aligned} \ln IMP_{cpt} = & \beta_1 Ineffect\_GSP_{ct} \times GSP\_country_c \\ & \times GSP\_product_p + \delta_1 Ineffect\_APP_{ct} \\ & \times APP\_country_c \times APP\_product_p \quad (4) \\ & + country/product_{cp} + country/year_{ct} \\ & + product/year_{pt} + \varepsilon_{cpt}. \end{aligned}$$

<sup>12</sup> In our notation, variables are preceded by a coefficient (in Greek letters); entries not preceded by coefficients indicate sets of dummies.

<sup>13</sup> A further reason for a differential effect for apparel products is the removal of apparel quotas. However, only two countries, Kenya and Mauritius, were subject to quota restrictions prior to AGOA.

<sup>14</sup> In the empirical implementation, we will allow different effects across subcategories of the GSP products. For simplicity, that discussion is postponed until section VI.

The coefficients of interest are  $\beta_1$ , measuring the impact of nonapparel access under AGOA, and  $\delta_1$ , measuring the impact of the apparel provision. Both triple interactions are measured relative to the three double interactions (country-time, product-time, and country-product). For example,  $\beta_1$  measures the import surge for GSP products coming from AGOA countries when the act was in effect relative to a country-product specific base level of imports pre-AGOA. This effect is measured controlling for overall import surges from any country and general U.S. import surges for GSP products.<sup>15</sup>

The discussion thus far has focused on responses at the intensive margin. Products for which African countries have positive export levels to the United States in spite of tariffs and quotas are likely to be products in which these countries have a strong comparative advantage. Most countries do not export the majority of products. Undoubtedly this reflects to a large extent comparative advantage, but it is also influenced by U.S. trade policy. The removal of trade barriers might lead countries to start exporting a wider range of products.

As we include zero import observations in the estimation of equation (4), the estimated effect of a change to duty-free status will include both the response at the intensive margin—increased exports—and the extensive margin—starting to export. We use a linear probability model to isolate the extensive margin response of the export decision. The dependent variable is a dummy variable that takes the value of 1 if the country-product-time observation has positive imports into the United States and 0 otherwise. The right-hand side of equation (4) is unchanged, and estimation is still with least squares. The advantage of the linear probability model is that we can keep the very general set of fixed effects. The main disadvantage—that predicted values are not restricted to lie on the (0, 1) interval—is unlikely to be much of an issue as all coefficients are identified off the time variation within country-product categories. Conditional on the country-product controls, the effect of trade liberalization on the export probability is likely to be relatively small.

## V. Data

The trade data are taken from the U.S. International Trade Commission. The dependent variable for most of the analysis is the log import of a particular product from each country in the world into the United States in each year from 1998 to 2006. If nothing is reported, imports are set to 0.<sup>16</sup> For the regressions that look at the extensive margin a dummy variable is created that takes the value of 1 if imports are positive.

<sup>15</sup> In the more restrictive specification (1), the surges are captured by the  $\alpha_3$  and  $\alpha_5$  coefficients.

<sup>16</sup> To create the dependent variable, we follow the usual practice of adding one unit (dollar) to all import values before taking logarithms. Other methods of handling the zeros are discussed in section VI.

TABLE 1.—SUMMARY STATISTICS, 2000

Number of Products and U.S. Import Values by Country					
	AGOA Countries (41)		Non-AGOA Countries (166)		
	Mean	Standard Deviation	Mean	Standard Deviation	
All products	5,120		5,120		
All products (import > 0)	102	(250)	694	(1,050)	
AGOA-eligible products (import > 0)	28	(57)	174	(222)	
Log imports (all)	0.208	(0.544)	1.616	(2.627)	
Log imports (import > 0)	9.938	(1.029)	10.732	(1.200)	

Limited to AGOA Countries					
By AGOA Country	Number of AGOA Products			Initial Tariffs on AGOA Products	
	All Products	Import > 0 (Mean)	Import > 0 (Maximum)	Mean (All Goods)	Mean (If Positive)
Apparel	239	14.37	120	13.1%	13.1%
GSP (all)	862	14.02	232	4.1%	8.2%
GSP—agricultural	282	3.61	51	3.7%	7.7%
GSP—mineral	4	0.00	0	1.7%	6.1%
GSP—petroleum	2	0.44	2	0.4%	1.0%
GSP—manufacturing	574	9.98	180	4.4%	8.5%

The list of nonapparel products that are added to the GSP list by AGOA is published by the U.S. Trade Representative, as is the list of apparel products eligible for AGOA treatment.<sup>17</sup> The list of AGOA-eligible countries, including whether they qualified for the apparel provision and the date they become eligible, is available from the U.S. International Trade Administration.<sup>18</sup>

We use the U.S. International Trade Commission import data and work at the HS six-digit level of aggregation.<sup>19</sup> The act defines apparel products treated under AGOA at the HS 6-digit (or higher) level, while nonapparel product codes of the AGOA-GSP list are at the eight-digit level. To capture this fact, the  $GSP\_product_p$  variable is not a dummy but varies continuously between 0 and 1. It is constructed to represent for each six-digit product the fraction of underlying eight-digit products (by value) that are eligible for duty-free imports. In the aggregation, eligibility dummies at the eight-digit level are weighted by the share of U.S. worldwide imports in each subcategory in the pre-AGOA period.<sup>20</sup> In contrast, the  $APP\_product_p$  variable is always a 0-1 dummy.

The data on tariffs are taken from Feenstra, Romalis, and Schott (2002).<sup>21</sup> The tariff rates are set at the eight-digit level, and we aggregate them to the six-digit level using the

same weights as for the AGOA-GSP eligibility dummies. The tariff rates are measured as either the ad valorem tariff or the ad valorem equivalent for specific tariffs.

Summary statistics for 2000, the year before AGOA took effect, are in table 1. AGOA countries export fewer products and smaller amounts than the average country, which is not surprising given their small size and low level of development. From the universe of 5,120 products, the average AGOA country has positive exports in 102, and 28 fall under the act. The average AGOA country exports 14.02 of the 862 eligible GSP products, three-quarters of which are manufactures. For apparel products, the average exposure is higher—14.37 out of 239 products—but the set of apparel-eligible countries is smaller. The most prolific exporter (South Africa) exports 120 apparel products and 232 of the GSP products. Average trade-weighted tariff rates are highest for apparel, at 13.1%, followed by GSP manufacturers, at 8.5%, and agricultural products, at 7.7%. For GSP products, a number of the poorest AGOA countries were already exempt from duties (see note 9).

## VI. Results

The results for equation (4) with a full set of country-product, country-year, and product-year fixed effects, estimated on the full balanced panel of all countries worldwide for all products, from 1998 to 2006 are in column 1 of table 2. The coefficient  $\delta_1$  on the triple-interaction term for apparel measures the effect of the apparel provision. It is identified from the change in pre- versus post-AGOA import levels for each country or product category, controlling for the baseline import level and general country and product import surges that can vary by year. The estimates indicate that the apparel provision in AGOA is associated with a 42% increase in imports into the United States. The coefficient  $\beta_1$  measures the effect of the nonapparel concessions

<sup>17</sup> These lists are available on the U.S. Trade Representative Web site: <http://www.ustr.gov>.

<sup>18</sup> The list is available on the ITA-sponsored Web site: <http://www.agoa.gov>.

<sup>19</sup> Note that at this level, our preferred specification already requires approximately 1.2 million fixed effects. Working at an even more disaggregated level would introduce mostly zero-import observations for the African economies.

<sup>20</sup> The average of the  $GSP\_product_p$  variable for treated products is 0.74, with more than half taking on the value of 1. Within the six-digit categories, the treated eight-digit categories significantly outweigh the untreated categories.

<sup>21</sup> Considerable thanks are due to these authors for making these data available at <http://www.nber.org/data>. As the tariffs drop to 0 with AGOA, we need only the tariffs prior to the act to analyze the effect.

TABLE 2.—BENCHMARK RESULTS FOR THE AGOA EFFECT

Dependent Variable	ln <i>IMP</i>	ln <i>IMP</i>	ln <i>IMP</i>	ln <i>IMP</i>	Import Dummy
Sample Method	Full Triple-Diffs (1)	Only AGOA Countries Diff-in-Diffs (2)	Only AGOA-APP products Diff-in-Diffs (3)	Only AGOA-GSP Products Diff-in-Diffs (4)	Full Triple-Diffs (5)
Marginal apparel effect	42.0%	44.4%	32.2%		3.0%
Marginal GSP effect	12.7%	−2.2%		0.4%	1.0%
<i>APP</i> : Ineffect × Country × Product	0.426 (8.03)**	0.452 (8.09)**	0.325 (6.01)**		0.030 (7.21)**
<i>GSP</i> : Ineffect × Country × Product	0.127 (10.56)**	−0.022 (2.60)**		0.004 (0.31)	0.010 (10.16)**
Fixed effects	Country/product, country/year, product/year	Country/product, country/year	Country/product, product/year	Country/product, product/year	Country/product, country/year, product/year
Observations	9,538,560	1,889,280	400,086	1,442,988	9,538,560
Number of fixed effects	1,107,783	210,289	46,605	168,090	1,107,783

Note: Absolute value of *t*-statistics in parentheses; \*significant at 5%; \*\*significant at 1%. Standard errors are robust to arbitrary heteroskedasticity and allow intragroup correlation within product category. In the spirit of Davis, Haltiwanger, and Schuh (1996), the marginal effect on import values throughout this paper is calculated as  $(IMP_A - IMP_{NA}) / (0.5 \times (IMP_A + IMP_{NA}))$ , to deal with 0 values for  $IMP_{NA}$ , and therefore restricted to lie between −2 and 2. Controls in columns 1 and 5 include country-year, product-year, and country-product interaction dummies. Controls in column 2 include country-year and country-product interaction dummies. Controls in columns 3 and 4 include country-product interaction and year dummies and dummies for free-trade agreements that came into effect during the study period, as well as changes in trade relations (into and out of MFN and into and out of GSP eligibility).

under AGOA for products added to the GSP list. AGOA raised those imports by 13%.

To compare, we also report difference-in-differences estimates. In column 2, the sample is limited to AGOA countries, and so focuses on the difference between AGOA and non-AGOA products—the difference-in-differences in the first line of equation (2). As in the triple-difference estimation, a full set of country-product fixed effects is included. Country-year dummies are also included to allow the differential timing of AGOA across countries, but we have to omit the product-year dummies. This estimator identifies the AGOA effect solely from the relative import growth for eligible versus other products. The apparel effect is overestimated slightly at 44% instead of 42%, indicating that U.S. import demand for apparel products increased for non-AGOA countries as well. The AGOA-GSP effect is underestimated at −2.2%, indicative of reduced U.S. demand for these products.

The difference-in-differences method can also be implemented by restricting the sample of AGOA-treated products but including all countries. We examine GSP products separately from apparel because the set of qualifying countries differ. This way, we use the treated products in untreated countries as the control group.<sup>22</sup> The full set of country-product and product-year fixed effects is included, but now we have to omit the set of country-year dummies. The apparel effect, in column 3, becomes 32% and is still significant; the AGOA-GSP effect, in column 4, becomes 0.4% and insignificant. Both underestimate the impact of AGOA, as the estimates fail to take into account the overall drop in U.S. imports from AGOA countries, for eligible and other products alike.

<sup>22</sup> In the triple-difference results of column 1, the control group for both apparel and GSP products is the set of nonapparel, non-GSP products. The separate analysis in columns 3 and 4 avoids lumping import changes for apparel and GSP imports from non-AGOA countries together in the control group.

Note that the method of handling zero values in the estimation has been to use a functional form that adds 1 to all import values before taking algorithms, and then to calculate the marginal effects appropriately for this functional form. In table A1, we demonstrate that a significant AGOA effect of a similar magnitude remains with other functional forms.<sup>23</sup>

Finally, in the last column in Table 2, we report the effects of AGOA on the probability that an eligible country exports a product to the United States. For products under the apparel provision, the probability is increased by 3.0% in the post-AGOA period. In terms of economic magnitude, this effect is large compared to an average probability of 23.5% for all countries worldwide and 6.0% for AGOA countries prior to the act. The GSP effect is also positive and significant. The probability that an AGOA country exports a GSP product to the United States is increased by 1.0%, an extremely large change relative to an average initial probability of 9.8% for all countries worldwide and 1.6% for AGOA countries.

The results of table 2 measure the average effect in the years following the act's implementation. We examine the timing of the effects by further interacting both triple-interaction terms with year dummies. Most countries are eligible for duty-free treatment on GSP products at the outset in January 2001, and so the progress of the AGOA-GSP effect can be measured over the six years 2001 through 2006. Since 12 of the 26 countries ever declared eligible for the apparel provision were declared such in the latter half of 2001 and the first half of 2002, we chose 2002 for the

<sup>23</sup> The results in column 5 remove the extensive margin response entirely from the estimated AGOA effect. We include a dummy for zero import values in the regression, which obviates the need for any addition to import values before taking logarithms. Moreover, these results are likely to underestimate the intensive margin response by biasing upward the relative post-AGOA evolution of imports in non-AGOA country-product categories.

TABLE 3.—TIMING THE IMPACT OF AGOA

Dependent variable Sample Method	In <i>IMP</i> Full Triple-Differences (1)	Import Dummy Full Triple-Differences (2)
Marginal apparel effect		
2002 ( <i>t</i> *)	21.9%	1.8%
2003 ( <i>t</i> * + 1)	41.2%	3.2%
2004 ( <i>t</i> * + 2)	42.7%	3.0%
2005 ( <i>t</i> * + 3)	47.6%	3.1%
2006 ( <i>t</i> * + 4)	44.4%	3.0%
Marginal GSP effect		
2001 ( <i>t</i> *)	6.4%	0.5%
2002 ( <i>t</i> * + 1)	4.5%	0.4%
2003 ( <i>t</i> * + 2)	11.5%	0.9%
2004 ( <i>t</i> * + 3)	14.4%	1.1%
2005 ( <i>t</i> * + 4)	20.9%	1.7%
2006 ( <i>t</i> * + 5)	23.7%	1.9%
<i>APP</i> : Ineffect × Country × Product		
2002 ( <i>t</i> *)	0.220 (4.71)**	0.018 (4.12)**
2003 ( <i>t</i> * + 1)	0.418 (7.08)**	0.032 (6.46)**
2004 ( <i>t</i> * + 2)	0.434 (7.44)**	0.030 (6.35)**
2005 ( <i>t</i> * + 3)	0.485 (7.19)**	0.031 (5.59)**
2006 ( <i>t</i> * + 4)	0.452 (7.23)**	0.030 (5.53)**
<i>GSP</i> : Ineffect × Country × Product		
2001 ( <i>t</i> *)	0.064 (6.10)**	0.005 (4.83)**
2002 ( <i>t</i> * + 1)	0.045 (3.04)**	0.004 (3.02)**
2003 ( <i>t</i> * + 2)	0.115 (7.07)**	0.009 (6.73)**
2004 ( <i>t</i> * + 3)	0.144 (9.10)**	0.011 (8.42)**
2005 ( <i>t</i> * + 4)	0.210 (12.40)**	0.017 (12.04)**
2006 ( <i>t</i> * + 5)	0.238 (13.50)**	0.019 (13.04)**
Observations	9,538,560	9,538,560
Number of fixed effects	1,107,783	1,107,783

Note: Absolute value of *t*-statistics in parentheses; \*significant at 5%; \*\*significant at 1%. Standard errors are robust to arbitrary heteroskedasticity and also allow intragroup correlations within product category. Controls include country-product, country-year, and product-year interaction dummies. The year *t*\* indicates the onset of the AGOA trade liberalization for the majority of the countries—2001 for GSP products and 2002 for apparel.

average onset of the apparel provision.<sup>24</sup> Therefore, there are only five years of AGOA apparel implementation to consider.

The results of this estimation are in table 3. For both sets of products, the impact of AGOA grows significantly over time, from 21.9% to 44.4% for apparel products and from 6.4% to 23.7% for GSP products. Again, this combines the effect of starting to export in new product categories and expanding exports within existing categories. Results in the second column indicate an important change at the extensive margin. The increase in the probability of exporting a product rises over time, from 1.8% to 3.0% for apparel and from 0.5% to 1.9% for GSP products. Especially for the last

category, this response is extremely large. From 2000 to 2006, the probability a GSP product is exported to the United States approximately doubles.

For GSP products, the estimate of the AGOA impact in the final year of our sample (23.7%) is considerably larger than the average effect captured over the six years of AGOA impact (12.7%, from table 2). The effect grows gradually over time, consistent with the large response at the extensive margin for these products. For apparel products, the major expansion in product lines happened relatively quickly in the first two years and has not increased since then, although the volume in these product lines has continued to increase.

The apparel results are most striking when they are placed in context of the dismantling of the MFA quotas on January 1, 2005 (year 4 of the apparel implementation). The end of the MFA brought increased competition from non-AGOA producers, and from China in particular. Nevertheless, the two years when the impact of AGOA on apparel was largest were the two years after the end of the MFA: 2005 and 2006.

To this point, we have assumed that the impact of AGOA treatment is the same across subcategories of GSP products. We now relax this assumption. The 1835 eight-digit HS products added to the GSP list under AGOA can be categorized as agricultural (617 products), minerals (4), petroleum and related products (11), and manufacturing, including chemicals (1,203). The rules and timing of the trade liberalization are identical for each subcategory. Allowing heterogeneous AGOA treatment effects for these subcategories simply requires replacing the *GSP\_product<sub>p</sub>* term in equation (4) with four terms—one for each of the subcategory.

Table 4 repeats the triple-interaction specifications of table 2, allowing heterogeneous effects. Obviously the effect on apparel exports does not change, but for the GSP subcategories, there are considerable differences. The petroleum and mineral effects are insignificant, while effects are positive and significant for both the agricultural and manufactured product categories. AGOA resulted in an 8.3% increase in imports for GSP–Agricultural products and a 15.7% increase for GSP–Manufactured products.

The second column again explores the effect on the probability of exporting a particular product. Here, the signs, significance and relative magnitude of the effects mirror those on the intensive margin, but some of the absolute magnitudes are surprisingly large. The probability that an AGOA country exports a GSP–Agriculture product increases by 0.7% relative to a baseline percentage of AGOA countries for these products of only 1.3% prior to AGOA (and 7.4% in this category for all countries). That is, the probability of exporting these agricultural products rises by more than one-half. For minerals, the AGOA-related increase is 1.5%, relative to a baseline of 0 (only four products here) prior to the act for AGOA countries, and 1.6% for all countries prior to the act. The point estimate for

<sup>24</sup> Of the remaining thirteen, only five were declared eligible in the first half of 2001, with the remaining eight declared eligible later than 2002.

TABLE 4.—RESULTS FOR THE AGOA EFFECT FOR DISAGGREGATED CATEGORIES

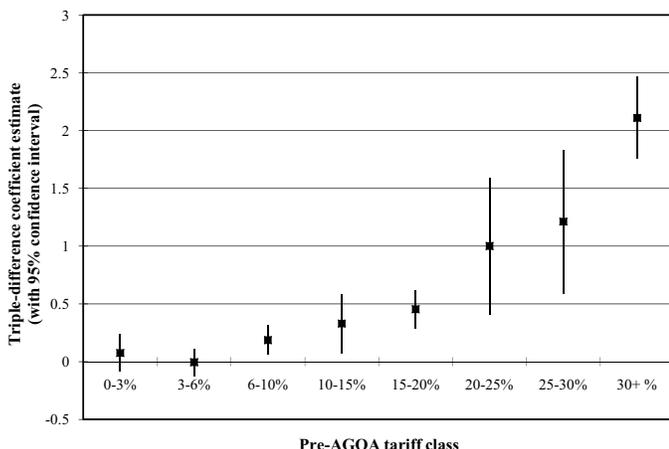
Dependent Variable Sample Method	ln <i>IMP</i> Full Triple-Differences (1)	Import Dummy Full Triple-Differences (2)
Marginal apparel effect	42.0%	3.0%
Marginal GSP effect		
Agriculture	8.0%	0.7%
Minerals	16.6%	1.5%
Petroleum	73.5%	4.0%
Manufactures	14.6%	1.2%
Ineffect × Country × Product Interaction		
<i>APP</i>	0.426 (8.03)**	0.030 (7.21)**
<i>GSP–Agriculture</i>	0.080 (4.48)**	0.007 (4.29)**
<i>GSP–Minerals</i>	0.166 (2.03)*	0.015 (2.50)*
<i>GSP–Petroleum</i>	0.771 (0.93)	0.040 (0.99)
<i>GSP–Manufactures</i>	0.146 (10.13)**	0.012 (9.52)**
Observations	9,538,560	9,538,560
Number of fixed effects	1,107,783	1,107,783

Note: Absolute value of *t*-statistics in parentheses; \*significant at 5%; \*\*significant at 1%. Standard errors are robust to arbitrary heteroskedasticity and allow intragroup correlation within product category. Controls include country-year, product-year, and country-product interaction dummies.

GSP–Petroleum products is large but estimated highly insignificantly. For GSP–Manufactures, the probability of exporting increased by a full 1.2% as a result of AGOA, relative to a baseline of 1.8% for AGOA countries prior to the act. This was a two-thirds increase!

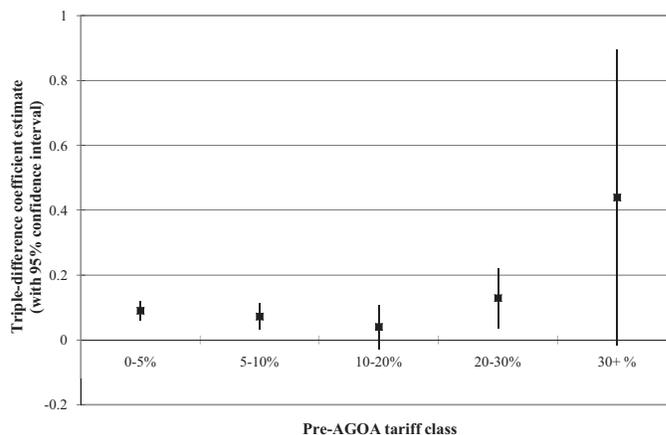
In sum, we find that the act increased apparel trade substantially, while the import response of other eligible manufactured products are relatively large as well. While AGOA countries export notably fewer products than most other countries, this gap decreased tremendously following the act. The large increase in the probability of exporting is

FIGURE 1.—(LOG) IMPORT RESPONSE BY PRE-AGOA TARIFF CLASS FOR APPAREL PRODUCTS



Note: Point estimates and 95% confidence intervals for the coefficients on the triple-difference term interacted with dummies for pre-AGOA U.S. import tariff brackets.

FIGURE 2.—(LOG) IMPORT RESPONSE BY PRE-AGOA TARIFF CLASS FOR AGOA-GSP PRODUCTS



Note: Point estimates and 95% confidence intervals for the coefficients on the triple-differences term interacted with dummies for pre-AGOA U.S. import tariff brackets.

consistent with the AGOA effect growing over time, especially for GSP products.

Next, we investigate the importance of pre-AGOA U.S. tariff rates. Import tariffs on eligible products are eliminated entirely, but initial rates of protection differed widely. As a result, the extent of trade liberalization also varies widely. Rather than enforce a proportional effect of tariff reductions, we flexibly estimate the impact of tariff reductions of different magnitudes by interacting the two triple-interaction terms in equation (4) with dummies for different tariff classes.<sup>25</sup> As such, we also different responses by initial rate of protection. For apparel products, we use eight tariff classes, and for GSP products (pooling all subcategories), which are on average subject to lower tariffs, five.<sup>26</sup>

The point estimates and 95% confidence intervals for all triple-interaction effects are plotted in figure 1 for apparel and in figure 2 for GSP products. We find that the effect of tariff reductions is distinctly nonlinear. For apparel, the estimated coefficients on the two lowest tariff brackets are insignificant. For the other brackets, the estimates exceed 0.18 and are significantly different from 0.<sup>27</sup> Import response for small or moderate tariff reductions appear small in comparison to the responses in the high-tariff brackets. The effect of a tariff reduction of more than 30% is a seven-fold increase in apparel exports. The GSP coefficients are smaller, but the nonlinearity is still clearly present. The removal of the highest tariff rates is clearly associated with

<sup>25</sup> Frazer and Van Biesebroeck (2007) estimate percentage import responses to one percentage point reduction in tariffs. This allows the calculation of tariff elasticities for African exports or the counterfactual response to less than full liberalization.

<sup>26</sup> The lowest tariff class dummy for apparel takes the value of 1 if pre-AGOA tariffs were between 0% and 3% and 0 otherwise. Subsequent tariff classes use the following tariff brackets: 3%–6%, 6%–10%, 10%–15%, 15%–20%, 20%–25%, 25%–30%, and higher than 30%. For GSP products, the tariff brackets employed are: 0%–5%, 5%–10%, 10%–20%, 20%–30%, and higher than 30%.

<sup>27</sup> The width of the confidence intervals tends to vary inversely with the number of products that fall in each tariff bracket.

the largest import responses. The point estimate for tariff cuts of more than 30% is more than triple any other estimate. It indicates a 55% increase in exports, but the confidence interval is very wide as well and includes 0.

To this point, we have used all non-AGOA countries worldwide as the implicit control group. Given that the African countries' export composition is likely to differ substantially from more developed countries, we also report results excluding the OECD countries from the control group. These results are in column 2 of table A2, with the benchmark results repeated in column 1. The estimated impact of AGOA is very similar for the three categories of interest: slightly larger for agriculture and slightly smaller for apparel and manufacturers. Each of the AGOA effects remains positive and highly significant.

We have shown that AGOA has resulted in a significant increase in imports from eligible countries into the United States. From a policy perspective, it is important to differentiate whether this increase was the result of new export creation or merely a redirection of exports from elsewhere. The most straightforward approach to answer this question would be to run a similar set of regressions using as the dependent variable the AGOA country exports to the rest of the world, as reported in the U.N. Comtrade database. Unfortunately, African countries report exports only sporadically. At most, nine AGOA countries would remain in the sample for such an analysis. Moreover, trade statistics tend to be collected less accurately on the export than on the import side.

Instead, we test whether the act had an effect on the exports from AGOA countries to the 25 countries of the EU, as these are Africa's main trading partners. Trade is most likely to be redirected from export destinations with similar tastes and level of development. We use a regression of the form of equation (4), but with EU imports as the dependent variable. If AGOA merely resulted in attracting imports to the United States that had previously been going to Europe, we should find negative coefficients now.

Our data set of EU imports is comparable to the U.S. data but limited to the years 1999, 2000, 2002, and 2003. For comparability, we report the U.S. results estimated for these four years in column 3 of table A2. The results are similar to the nine-year benchmark estimates in column 1, although the agriculture effect is not insignificant. The impact of AGOA on EU imports is in column 4. The effects for most product categories are not significantly different from zero.<sup>28</sup> The only significant effect is a 4% increase for EU

imports of GSP–Manufactured products. One explanation (among many) could involve spillover effects from the increased U.S. imports. The experience of exporting to the United States could make it easier to export to the EU—for example, if infrastructure or logistics costs can be shared across destinations. The results clearly show that the large U.S. import responses found earlier are not merely the result of redirected E.U. exports.

Another type of possible trade redirection as a result of AGOA would be trade diversion: that imports previously coming from other countries (likely other developing countries) into the United States are now replaced by imports for AGOA countries. A first indication that this effect is likely to be limited is the similarity between the estimated AGOA effects when rich countries are excluded (column 2 in table A2) and the benchmark effects. Trade diversion should be more prominent, but most point estimates are slightly lower. It is worth noting that the AGOA countries remain a small fraction of the market within most product categories. For eligible products, the post-AGOA total market share for all AGOA countries combined is on average 0.7%. Moreover, for 98.6% of product categories, the combined market share of all AGOA countries at the end of our study period is less than 10% of the overall market. AGOA may certainly have an effect on the market shares for some countries in some product categories, but the total impact on other countries will be limited.<sup>29</sup>

We have performed additional checks on the robustness of our result, but to conserve space, we refer readers to the working paper version of this paper (Frazer & Van Biesebroeck, 2007). There we demonstrate that the impact of AGOA is robust to allowing a shorter window of treatment (1998–2003), allowing fewer dummy variables with more restrictive specifications, and treating even those countries that did not have access to the apparel provision as though they did.

## VII. Implications

### A. Heterogeneous Effects

One might wonder whether the large and robust effects identified earlier apply to all countries or whether they are driven by outliers. We can evaluate the impact of AGOA at

imports, which hardly appears in the results of column 4 of table A2. The European initiative should have no effect, however, on either the GSP–Manufactures or apparel results.

<sup>29</sup> We measure the average impact of AGOA on imports from other developing countries as follows. Using the time-varying AGOA impact coefficients, we calculated a dollar value for the imports caused by AGOA (see table 6 for more details on this) by year and AGOA-product category. Then, dropping AGOA and OECD countries, we regress imports on country-product and country-year interaction dummies (control variables), as well as the AGOA-induced imports variable. In product lines where AGOA increased imports from Africa, we might expect to see decreased imports from elsewhere, but this was not the case. The AGOA variable was insignificant and positive ( $p$ -value of 0.262) in this regression.

<sup>28</sup> It should be noted that at roughly the same time as AGOA, Europe was implementing its Everything But Arms initiative for least developed countries (LDCs). Thirty-three of the 49 affected LDCs are in sub-Saharan Africa. The only aspect of this initiative that overlapped with our study period was the removal of some European agricultural tariffs in March 2001, as EU industrial tariffs had already been removed by this point. To the extent that these agricultural tariffs overlap with those removed under AGOA, we underestimate the effect of AGOA on agricultural products. We should also find a positive impact of AGOA on European agricultural

a more disaggregate level by estimating the category-specific triple-interaction effects separately for each country. Estimation is as before, but the  $GSP\_country_c$  and  $APP\_country_c$  variables in equation (4) are replaced with the full set of country dummies (for eligible countries). For the three categories of interest—Apparel, GSP–Manufactures, and GSP–Agriculture—the average country-specific estimates are 0.409, 0.145, and 0.082. These line up quite closely with the results in table 4 that force the same effect on all AGOA countries; estimates there were 0.426, 0.146, and 0.080. The full set of coefficients is reported in Frazer and Van Biesebroeck (2007).

The dispersion across countries is quite small for GSP–Manufactures and only slightly higher for GSP–Agriculture. For agriculture, 24 of the 26 significant coefficients are positive, suggesting that in almost two-thirds of the AGOA countries, AGOA increased agriculture exports.<sup>30</sup> The average effect among these countries was 11%. For manufacturers, all of the significant coefficients are positive, with 35 of the 41 countries showing a positive effect of AGOA on GSP–Manufactures exports. Within this set, the average coefficient is 17%, only slightly above the aggregate coefficient, highlighting the broad-based impact of AGO.

For apparel, the dispersion of the point estimates is much larger. Five of the 26 countries show a negative impact, although only two are significant—with an average effect of  $-11.0\%$ . One is for Côte d'Ivoire, which joined the apparel provision only in 2004 and was forced to leave after one year; the second country is Senegal. The positive estimates are significant in 14 of the 21 cases, and the average is  $72\%$ , but the range, even among the significant coefficients, is large—between 9 and  $155\%$ .

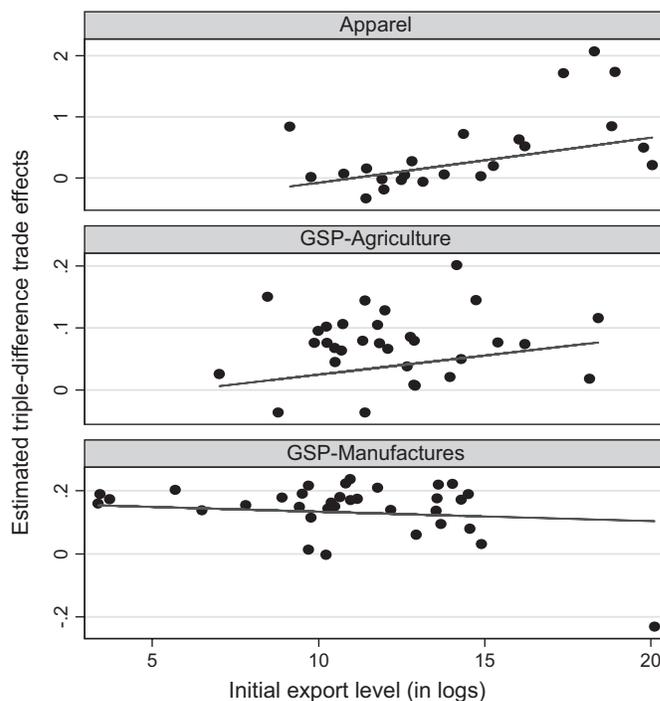
Moreover, the export responses associated with AGOA are increasing in the country's initial level of exports, at least for apparel. The estimated country-level impact coefficients are plotted against the initial export level in figure 3. The correlation is high, 0.58, and highly significant. Countries that were already exporting considerable quantities of apparel reaped the largest benefits from the U.S. trade liberalization. There is a clear positive slope on the predicted regression line for the AGOA coefficient estimate on the initial export level.<sup>31</sup> For the GSP categories, the relationship between initial export volumes and AGOA effects is less pronounced.<sup>32</sup>

<sup>30</sup> The two significantly negative coefficients are for Central African Republic and Eritrea, which were both removed from the program on January 1, 2004, for political reasons already outlined.

<sup>31</sup> As pointed out by a referee, the positive correlation between the AGOA apparel impact and the initial export level should lead to our understating the true average AGOA apparel elasticity.

<sup>32</sup> The regression lines in figure 3 are estimated weighing countries by the precision of their estimates. The respective  $t$ -statistics for apparel, agriculture, and manufactures are 2.78, 1.18, and  $-0.78$ . While the South African point estimate for manufacturing is large and negative, it is estimated very imprecisely.

FIGURE 3.—COUNTRY AND CATEGORY-SPECIFIC AGOA EFFECTS AND INITIAL EXPORT LEVELS



Notes: Each country is one data point. On the vertical axis are the country-specific triple-difference estimates for each of the three product categories. On the horizontal axis is the logarithm of the pre-AGOA export volume (averaged for 1999–2000). The lines represent the predicted values from separate OLS regressions of the estimated AGOA effects on the initial (log) export levels (using the inverse of the standard deviation of each coefficient estimate as weight).

The country-specific differences are not random. When we regress the estimated triple-interaction coefficients on variables that have proven to predict trade flows well in the gravity question literature, most signs are intuitive. We include the same variables in the regression as Rose (2004) and add the time and time-squared that a country has enjoyed duty-free access, but omit the English-language dummy and the remoteness variable to conserve degrees of freedom.<sup>33</sup> The precision, the inverse of the standard deviation for the coefficient estimates, is used as weight. Results are in table 5.

Distance to the United States is a negative and significant predictor for the agriculture and manufactures effect, and the coefficient on the GDP variable is positive and significant, as expected. The population density—country population divided by area—is negative and significant for both agriculture and manufactures.<sup>34</sup> The effect of time is significant and convex, suggesting that the impact on GSP imports grows more strongly over time. The landlocked dummy is never significant. The gravity variables have been effective in predicting trade volumes, and here they explain (along with time) more than 60% of the country variation in the response to trade liberalization for the GSP products as

<sup>33</sup> The  $t$ -statistics on these variables never exceed 0.5.

<sup>34</sup> Since population and land area typically enter negatively in gravity equations, our priors on the sign of population density were not as strong.

TABLE 5.—GRAVITY EQUATION VARIABLES PREDICT EFFECTS FOR GSP PRODUCTS WELL

	Dependent Variable: Triple-Interaction Coefficient Estimate		
	Apparel	GSP–Agriculture	GSP–Manufactures
Distance to United States	0.398 (0.357)	−0.099*** (0.032)	−0.084** (0.031)
ln GDP	−0.049 (0.083)	0.018** (0.007)	0.019** (0.007)
Population density	0.077 (0.789)	−0.210** (0.085)	−0.174** (0.084)
Landlocked dummy	−0.084 (0.136)	−0.005 (0.015)	−0.001 (0.015)
Time in AGOA	0.093 (0.100)	0.054*** (0.010)	0.057*** (0.011)
(Time in AGOA) <sup>2</sup>	0.044 (0.037)	0.018*** (0.004)	0.014*** (0.004)
Constant	−2.463 (3.698)	0.732** (0.326)	0.624** (0.302)
Observations	26	41	41
R <sup>2</sup>	0.198	0.663	0.633

Note: OLS regression of country and product-category specific triple-interaction coefficients (estimated as in table 2) on gravity-model variables. The inverse of the standard deviations of the coefficient estimates are used as weights. Standard errors in parentheses. \*Significant at the 10% level, \*\*5%, \*\*\*1%.

well. In contrast, none of the coefficients are significant in the apparel regression. This may be partly related to the smaller number of observations in the regression, but may also reflect that the apparel response appear well explained by the pre-AGOA levels of apparel exports, as noted earlier.

Our identification methodology for the AGOA effect is immune to other liberalizations that might be occurring in AGOA countries, as those will be absorbed by the country-year fixed effects.<sup>35</sup> We can still determine whether the country-level AGOA coefficients are correlated with tariff changes in AGOA countries themselves. Such liberalizations might allow these countries to take better advantage of the AGOA preferences. Average applied tariff data have been compiled from the World Bank, primarily from UNCTAD sources.<sup>36</sup> We find that changes in tariffs during AGOA (the difference in the average tariffs across all goods between the 1996–2000 and 2001–2005 periods) are uncorrelated with any of our impact coefficients. We also did not find a correlation between tariff changes during the 1990s and our coefficients, as would be the case if domestic reforms had a delayed impact. Finally, there is no clear relationship between the average level of African trade protection at the onset of AGOA and the country-level impacts. For apparel, the correlation is negative, which is intuitive, but insignificant; for GSP products, no relationship exists.

We also examined whether a relationship exists between the estimated trade responses and indicators for quality of

<sup>35</sup> In terms of AGOA country trade policy, only if AGOA countries were targeting the specific AGOA category products with export subsidies (which we have no evidence that they were) would this affect our estimation of the AGOA coefficient. However, even such export subsidies are an endogenous response to the AGOA legislation.

<sup>36</sup> Information is available online at the World Bank Web site: <http://go.worldbank.org/LGOXFTV550>.

governance. The negative impact of corruption on growth has been studied extensively and is now widely acknowledged. The evidence across countries (e.g., Mauro, 1995) has been confirmed by firm-level evidence (e.g., Fisman & Svensson, 2007).

The two left-most panels in figure 4 plot the estimated coefficients for GSP-products (at the top) and for apparel (bottom) against the widely used World Bank indicator of corruption.<sup>37</sup> The cloud of estimates does not reveal much of a pattern, and the slopes of the two regression lines are insignificant in both panels. While countries with less corruption, positive indicators, have done somewhat better on average, the range of the estimates for countries with high or low corruption is very wide. In particular, two of the countries with the largest apparel effects, Kenya and Madagascar, are also among the most corrupt.

An equally large literature studies the relationship between growth or development and the quality of institutions or the protection of investors' property rights. In particular, a number of authors have investigated the relative importance of institutions versus trade as an engine of growth. While Dollar and Kraay (2003) find both factors to be important, especially in the short run, Rodrik et al. (2004) find that institutions trump all other effects. Given that countries with better institutions also trade more (see Dollar & Kraay, 2003, for evidence), it is interesting to verify in the African case whether countries with better institutions are also better able to take advantage of the U.S. trade liberalization.

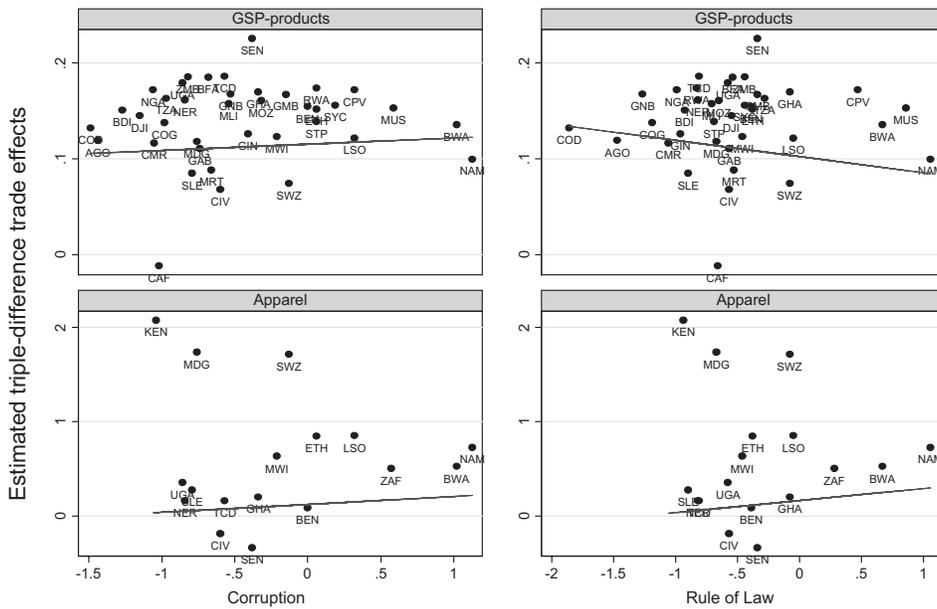
The right-most panels in figure 4 plot the estimated AGOA effects against the World Bank indicator of rule of law. The estimates are again all over the map, and, similarly as for corruption, neither of the regression lines is significant. An important consideration here is that we are examining countries that have already met a minimum threshold for governance, in terms of legal and democratic freedoms, in order to be admitted to AGOA. The worst-governed African countries are excluded entirely. Overall, then, although others have demonstrated the ability of less corrupt countries with better institutions to grow faster, here we find that for countries above the minimum threshold of institution quality, countries with various levels of corruption and legal institutions are able to benefit from improved market access granted to them.

### B. Aggregate Trade Effects

The analysis thus far has focused on African exports for narrowly defined product categories. We have documented very large percentage changes, but obviously the aggregate importance depends on the initial level of exports for the products affected most. The impact of AGOA is placed in the context of the aggregate export level in table 6.

<sup>37</sup> The governance indicators are available online at <http://www.worldbank.org/wbi/governance/data>.

FIGURE 4.—RELATIONSHIP BETWEEN COUNTRY-SPECIFIC EXPORT RESPONSES AND GOVERNANCE INDICATORS



Note: On the vertical axes are the country-specific triple-differences estimates for GSP products (top panels) and apparel (bottom panels). On the horizontal axes are two governance indicators, on a scale of  $-2.5$  to  $+2.5$ , taken from the World Bank Web site. Only countries with a  $t$ -statistic above 1 are plotted. The predicted regression lines are for least squares regressions, weighing all estimates by the inverse of their standard deviation.

The first column indicates total AGOA country exports to the United States in the key product categories—apparel, agriculture, and manufacturers—averaged over the three years prior to the act.<sup>38</sup> These exports of selected AGOA products comprise 24% of nonoil exports to the United States prior to the act. In the following years, the export increase in these three product categories was large, with a 94% or \$1.2 billion increase overall, as noted in percentage and absolute terms in columns 2a and 2b. The increase was particularly large for apparel, at 120%. AGOA products accounted for almost half of the total increase in nonoil exports—twice as high as their initial share. As a result, their average share in the 2002–2006 period increased to 32%.

The observed export increases do not account for worldwide surges in these product categories during the AGOA time period or for price changes within the product categories,<sup>39</sup> which motivated us to use the triple-difference estimation methodology to measure the AGOA impact. The effects we estimated before, repeated in column 3a, suggest that only a fraction of the observed export increase can be attributed to the act. Multiplying the estimated percentage changes by the pre-AGOA export levels of the first column

provides an estimate of the AGOA-induced increase in exports, reported in absolute terms in column 3b. This totals \$360 million, most of which is in apparel. It represents 29.4% of the export growth in the affected product categories (in column 3c) and 14.3% of the total nonoil export growth in the post-AGOA period (in column 3d).

To place this figure in a slightly wider context, the AGOA-induced increase amounts to approximately 0.12% of the AGOA countries' GDP in 2000. While this number is modest, it is not trivial. Moreover, it is reflective of the modest nature of the program, especially for goods other than apparel. The average tariff rates (from table 1) on the affected GSP products were 4.1% (overall), 3.7% (agricultural goods), and 4.4% (manufactures). The average tariff rates on the goods not included in the act were 3.9% (overall), 10.4% (agriculture), and 2.8% (manufactures). Moreover, current imports of nonoil products not included in the act are approximately four times larger than imports for products that fell under the act. It suggests that there remains scope for liberalizing imports from Africa further, particularly in agriculture.<sup>40</sup> Even further unilateral action by the United States could multiply the estimated impact on these countries' GDP.

Finally, while we have shown that the removal of trade barriers can have a large impact on African exports, the domestic (African) factors cited in the literature review are likely to keep constraining exports as well. While the scope of this study does not allow comparing the relative impact

<sup>38</sup> We focus on these categories since the petroleum effect is significant only for petroleum-exporting countries and insignificant overall. The minerals category, while positive and significant, contains only four products, and we refrain from drawing broader conclusions from this.

<sup>39</sup> The import values have been deflated to 2000 USD using U.S. import price indices available at the U.S. Bureau of Labor Statistics Web site ([www.bls.gov](http://www.bls.gov)), which does not account for the detailed within-product-category price changes.

<sup>40</sup> It is worth remembering as well that in addition to these tariffs, significant nontariff barriers remain, for example, in the form of production subsidies for agricultural products.

TABLE 6.—ACTUAL INCREASE IN EXPORTS TO THE UNITED STATES AND ESTIMATED AGOA IMPACT

	Pre-AGOA Exports		Actual Increase		Estimated AGOA Impact		
	(1998–2000)		(1998/2000–2002/2006)		(1998/2000–2002/2006)		
	(1)	(2a)	(2b)	(3a)	(3b)	(3c)	(3d)
	Million USD	As % of Pre-AGOA Exports	Million USD	Estimated Coefficient	Million USD	As % of Category Export Growth	As % of Total Nonoil Exports Growth
Apparel	656	120.4%	789	42.0%	275	34.9%	10.9%
GSP—Agricultural	154	54.1%	83	8.0%	12	14.8%	0.5%
GSP—Manufactures	495	71.3%	353	14.6%	72	20.4%	2.9%
Total for three AGOA categories	1,304	93.9%	1,225		360	29.4%	14.3%
Total nonoil exports	5,472	46.0%	2,517				
Total exports	17,813	96.2%	17,137				

Note: Own calculations based on statistics from the U.S. ITC data set and coefficient estimates from table 4. All values are in millions of U.S. dollars.

of domestic factors versus developed country trade restrictions, what we do show is that when even some trade restrictions are removed, we see a significant impact.

### C. Other Issues

General equilibrium considerations imply that good prices will adjust after the trade liberalization. In the United States, the effect is likely to be minor, as AGOA imports are only a tiny fraction of total imports. For apparel, the act explicitly specifies a limit on the AGOA import share in order for products to remain exempt from tariffs and quotas. By the end of 2006, the cap was around 6%, and even that proved nonbinding. Price effects for domestic consumers in the AGOA countries are also likely to be minor, as most export products, especially those that saw tariffs drop significantly, are specialized for export markets.

For exporters, a fraction of the AGOA effect we estimate may represent an increased price as our trade values are the customs values (i.e., exclude duties).<sup>41</sup> Using unit values as a dependent variable in our usual specification, we can test whether the prices are higher for AGOA products from AGOA countries post-AGOA. The results are in table A3. Price changes post-AGOA are measured relative to a baseline unit value level for that country-product and relative to the overall unit value changes in the product category worldwide. The point estimates for the three product categories of interest (apparel, agriculture, or manufactures) are consistent with African export prices increasing post-AGOA, but the changes are never significantly different from 0. It suggests that the bulk of the AGOA effect represents a quantity increase.

If the better export opportunities lead to higher production, it is necessary to subtract the opportunity cost of the additional resources to net welfare gains from output gains. Obviously that analysis is beyond our data, but it is worthwhile to recall that the export response rises disproportionately with the rate of protection (see figures 1 and 2).

<sup>41</sup> Note that the product-year fixed effects control for arbitrary changes in the world price within product categories. Note also that our expectation of a higher price resulting from the dropping of duties is related to simple partial-equilibrium considerations.

Production distortions are most likely for the most protected products. Moreover, we found no evidence of trade redirection from Europe, which might be the first expected margin of adjustment for resource use.

An additional benefit of the act that has been documented by several observers (see, e.g., Lall, 2005, and Roberts & Thoburn, 2003) is the attraction of foreign direct investment (FDI) to eligible sectors, apparel in particular. Anecdotal evidence suggests that new foreign firms that enter these countries brought better technology and organization, boosting domestic performance. It has also led many firms to upgrade capital equipment, raising output further. Even at the aggregate level the increased FDI is apparent. Statistics in table A4 compare the level of inward FDI flows prior to and after the onset of AGOA, columns 1 and 3. Inflows increased by 77% in the AGOA countries, while the rest of the world saw a drop in FDI in the wake of the stock market crash of 2000–2001 and after 9/11. The increase for other developing countries was to a large extent driven by the accelerating FDI flows to China. In contrast, the average FDI flow into AGOA countries rose from \$7.1 billion (1999–2000 average) to \$12.5 billion (2004–2005 average). The bottom line in Table A4 indicates that the acceleration was not limited to oil-producing AGOA members. Inflows also increased relative to the outstanding stock of FDI, a trend that is limited to the AGOA countries.

A large literature investigates the potential beneficial effects of FDI in-flows: improved productivity, increased capital stock, and spillover effects on local firms. These effects are not necessarily limited to the sectors directly affected by the act. In addition, there is evidence that exporting entails sunk entry costs (see, e.g., Roberts & Tybout, 1997). If export opportunities are improved for one set of goods, firms will be more willing to invest in export infrastructure such as transport infrastructure, financial institutions, overseas contacts, and distribution. To the extent that other exports of other products benefit, we will have underestimated the effect of AGOA as the triple-difference estimate is relative to a country-baseline export performance.

### VIII. Conclusion

We have evaluated the impact of the African Growth and Opportunity Act (AGOA), enacted unilaterally by the United States at the end of 2000. The approach we have used allows us to control very generally for country-product specific baseline levels of imports and for country-specific and product-specific import trends in the post-AGOA period. As a result, we can be fairly confident that the results we estimate are directly tied to the act. Our findings highlight the importance of using triple-difference estimation. Results obtained on the same sample using standard difference-in-differences approaches that focus only on AGOA products or only on AGOA countries over- or underestimate the impact.

The import responses to AGOA that we find are very large for apparel products: imports increase on average by 42%. The 42% estimate is at the upper range of predictions before AGOA. The effect on AGOA-GSP products was also significant, with AGOA raising U.S. imports by an average of 13% across all AGOA-GSP products, including an 8% increase in GSP-Agriculture, and a larger and more robust 15% increase in GSP-Manufactured products. In addition to higher exports levels, we also find that the act led to more products being exported to the United States. This effect was particularly important for agricultural and manufactured products, raising the probability of exporting by more than half.

The effect has been increasing over time, particularly for the GSP products. Moreover, the effect on apparel exports continued after the end of the MFA on January 1, 2005. The years 2005 and 2006, when these African exporters faced increased competition in the U.S. market from China and other Asian countries, were the ones with the largest impact on apparel exports. The continuing duty preferences offered to African countries under AGOA could be sufficient to offset any relative competitive advantage of the Asian countries.<sup>42</sup> AGOA had a disproportionate impact for products that enjoyed the largest tariff reductions, particularly for apparel. Moreover, we find that the increased exports to the United States do not represent exports being redirected from Europe, Africa's other major export destination.

Allowing for differential impacts of AGOA by country, we explored the characteristics of the countries that generated the largest export responses. For apparel, countries that were already significant exporters to the United States initially were best poised to take advantage of the act. In contrast, the effect of AGOA on manufactures and agricultural products appears to be well explained by gravity variables. However, neither the apparel nor the GSP product increases were correlated in any way with measures of corruption or rule of law. Conditional on obtaining a suffi-

cient level of political and democratic freedom to qualify for the act, countries with widely varying levels of corruption and institutional quality were able to take advantage of it. The size of the country-specific effects is also not related to any of the African import tariff reductions that took place simultaneously.

While exports in the key AGOA product categories (apparel, agriculture, manufactures) increased 94% in the post-AGOA period, we estimate more conservatively, using the triple-difference method, that the causal impact of AGOA within these product categories was a 28% increase. While AGOA resulted in an 6.6% increase in total nonoil exports from Africa, this translates into a relatively modest impact on African GDP. Of course, the program itself was quite modest, with the exception of the provisions for apparel. The remaining tariffs on agricultural products are on average three times as high as the agricultural tariffs that were removed.

A further conclusion can be made from this study. In the context of the preferences offered under AGOA, none of the other limitations frequently cited in the African context—poor infrastructure, distorted product and credit markets, high risk, inadequate social capital, and poor public services—proved to be binding constraints to expanding exports under AGOA. While this might seem like a fairly modest statement, the literature summarized in the paper suggests, in the African context, it is not.

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<sup>42</sup> Africa's comparative advantage can result from political actions (such as U.S. "safe-guard" actions), as well as a desire to diversify the source of apparel imports, in addition to more traditional cost considerations.

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## APPENDIX

TABLE A1.—ROBUSTNESS CHECKS I: FUNCTIONAL FORM

Dependent Variable Sample Method	ln <i>IMP</i> Full Triple-Differences (1)	ln <i>IMP</i> Full Triple-Differences (2)	ln <i>IMP</i> Full Triple-Differences (3)	sqrt( <i>IMP</i> ) Full Triple-Differences (4)	ln <i>IMP</i> Full Triple-Differences (5)
Marginal apparel effect	42.0%	48.4%	35.3%	36.8%	14.5%
Marginal GSP effect	12.7%	15.0%	10.4%	6.4%	2.9%
<i>APP</i> : Ineffect × Country × Product	0.426 (8.03)**	0.494 (7.93)**	0.357 (8.14)**	53.928 (8.93)**	0.135 (7.95)**
<i>GSP</i> : Ineffect × Country × Product	0.127 (10.56)**	0.150 (10.54)**	0.104 (10.57)**	25.878 (6.20)**	0.029 (8.37)**
Observations	9,538,560	9,538,560	9,538,560	9,538,560	9,538,561
Number of fixed effects	1,107,783	1,107,783	1,107,783	1,107,783	1,107,783

Note: Absolute value of *t*-statistics in parentheses; \*significant at 5%; \*\*significant at 1%. Standard errors are robust to arbitrary heteroskedasticity, and allow for intragroup correlation within product category. Column 1 contains the benchmark specification. Column 2 adds 0.1 (dollars) to all import values before taking logarithms. Column 3 adds 10 to imports before taking logarithms. Column 4 uses the square root of imports (without any additions) as the dependent variable. In column 5, a dummy for zero import values is included in the regression, and the dependent value is log imports, without additions, but holding the dependent variable at 0 for 0 imports values. This removes the extensive margin response from the estimated AGOA effect. The marginal effects on import values throughout this paper are calculated as  $(IMP_A - IMP_{NA}) / (0.5 \times (IMP_A + IMP_{NA}))$ , to deal with 0 values for  $IMP_{NA}$ , and therefore are restricted to lie between -2 and 2. The calculations properly account for the possible addition of 1, 0.1, or 10 to the import values before taking logarithms. Controls in all columns include country-year, product-year, and country-product interaction dummies.

TABLE A2.—ROBUSTNESS CHECKS II: CONTROL GROUP, TREATMENT WINDOW, AND TRADE REDIRECTION

Dependent Variable Sample	ln <i>IMP</i> 1998–2006	ln <i>IMP</i> 1998–2006	ln (US <i>IMP</i> ) 1999–2000 and 2002–2003	ln (EU <i>IMP</i> ) 1999–2000 and 2002–2003
	(1) Benchmark	(2) Control Group	(3) Benchmark	(4) Redirected Trade
Marginal apparel effect	42.0%	40.0%	45.2%	2.2%
Marginal GSP–Agriculture effect	8.0%	8.7%	–0.4%	3.9%
Marginal GSP–Manufactures effect	14.6%	12.3%	6.2%	4.0%
Ineffect × Country × Product Interaction				
<i>APP</i>	0.426 (8.03)**	0.405 (7.72)**	0.460 (7.35)**	0.022 (0.58)
<i>GSP–Agriculture</i>	0.080 (4.48)**	0.087 (5.36)**	–0.004 (0.21)	0.039 (1.53)
<i>GSP–Minerals</i>	0.166 (2.03)*	0.207 (2.40)*	0.094 (1.32)	–0.072 (0.28)
<i>GSP–Petroleum</i>	0.771 (0.93)	0.254 (0.46)	0.903 (1.02)	1.498 (2.31)*
<i>GSP–Manufactures</i>	0.146 (10.13)**	0.123 (11.32)**	0.062 (4.38)**	0.040 (2.07)*
Observations	9,538,560	8,432,640	3,706,880	3,706,880
Number of fixed effects	1,107,783	979,344	947,924	947,924

Note: Absolute value of *t*-statistics in parentheses; \*significant at 5%; \*\*significant at 1%. Standard errors are robust to arbitrary heteroskedasticity and allow intragroup correlation within product category. Controls in all columns include country-product, country-year, and product-year interaction dummies. Column 2 does not include observations from OECD countries. Columns 3 and 4 use data for the years 1999, 2000, 2002, and 2003. Column 3 is for the same specification as in column 1, in column 4, the dependent variable is log EU imports.

TABLE A3.—AGOA UNIT VALUE CHANGES

Dependent Variable	ln <i>Unit Value</i>
Ineffect × Country × Product Interaction	
<i>APP</i>	0.033 (1.12)
<i>GSP–Agriculture</i>	0.043 (0.37)
<i>GSP–Minerals</i>	–2.419 (3.53)**
<i>GSP–Petroleum</i>	–0.044 (1.76)
<i>GSP–Manufactures</i>	0.081 (1.20)
Observations	888,007
Number of fixed effects	189,418

Note: Absolute value of *t*-statistics in parentheses; \*significant at 5%; \*\*significant at 1%. Standard errors are robust to arbitrary heteroskedasticity and also allow intragroup correlation within product category. Controls in all columns include country-product and product-year interaction dummies.

TABLE A4.—FDI INFLOWS

	Pre-AGOA (1999–2000)		Post-AGOA (2004–2005)		Change USD
	Million USD	% of FDI Stock	Million USD	% of FDI Stock	
World	1,254,744	23.4%	813,516	8.2%	–35.2%
Developing countries	241,155	14.8	290,453	11.8	20.4
Developing countries without China	200,590	14.0	223,886	10.3	11.6
AGOA countries	7,085	6.9	12,518	7.9	76.7
AGOA without oil producers	3,731	5.6	7,358	7.1	97.2

Note: Own calculations based on UNCTAD World Investment Report 2006. Latest year available for FDI statistics is 2005.