Working Paper

Preferential Trade Agreements, Employment, and Productivity: Evaluating the Impacts of AGOA and its Apparel Provisions on African Firms

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ABSTRACT

We evaluate the impacts of AGOA eligibility and its apparel provision eligibility on firm-level employment and productivity. We used a difference-in-difference-in-differences approach to alienate country and industry level confounders and other spillovers. Results show that AGOA and its apparel provision's impacts on employment are weak. While AGOA increased employment in very large firms only, its apparel provision did not have any effects on employment. On the other hand, AGOA and its apparel provision positively impacted firm productivity. This productivity growth was due to a reallocation of economic activities from less productive to more productive firms.

Keywords: Preferential trade agreements, employment, productivity, firms, Africa.

1. INTRODUCTION

The African Growth and Opportunity Act (AGOA) offers preferential access to selected sub-Saharan Africa (SSA) products into US markets. It allows duty and quota-free market access for almost all products as long as they are produced in and/or imported from approved SSA countries. AGOA was initially signed by then President Bill Clinton in 2000, and renewed and expanded in 2002 and 2004 respectively with a current expiration date of 2015. The commodities included in the provision are agricultural, minerals, manufacturing, apparel and footwear. The apparel provision has been the most popular component of AGOA; it allows duty-free access to apparel imported from approved African countries and has proven to be successful in creating and/or resuscitating the textile industry in many SSA countries (see anecdotal evidence at Cling *et al.*, 2005; Lall, 2005; Ancharaz, 2008).

The concept that initiated AGOA rests on the view that trade barriers imposed by high-income countries on commodity imports for which poor countries are likely to have a comparative advantage is one of many factors inhibiting the development of low-income countries in general, and SSA countries in particular. (Frazer and Van Biesebroeck, 2010). By providing a duty-free avenue for SSA countries to export the commodities they produce at relatively lower costs, SSA could emulate the East Asia economic growth model and promote an effective African export-led growth.

This growth, however, will not come overnight; it will be the result of a combination of policies and contingencies with change in export prices as a first order effect (Olarreaga and Ozden, 2005). In competitive markets, AGOA should increase the price exporters receive by as much as the tariff previously collected by the importing country's custom authorities.

This price increase will later translate into firm-level second order effects such as productivity and labor demand. Evidence shows that firm productivity increases due to high export prices will trigger a reallocation of economic activity from less productive firms to more productive ones (Bernard et al, 2007a).

Thus far, evidence suggests that AGOA has had positive effects on unilateral exports from SSA to the US[1]. Depending on the sectors, AGOA increased SSA exports to the US from 8% to 42%, with petroleum oil exports surpassing 100%; and increased the price textile exporters receive by up to 1/3 of the pre-AGOA tariff price (Olarreaga and Ozden, 2005). However, less is known about its second order effects; the impacts on firm-level covariates. This paper contributes to trade literature by providing empirical evidence of the impacts of AGOA and its apparel provision on firm-level productivity and employment. Since we are interested in capturing the impact of a country-level policy on firm-level outcomes, it is important to introduce within country heterogeneities. We use a difference-in-difference-in-differences (DDD) approach that will address this concern and capture other spillovers that may bias the results. The results indicate that AGOA and the apparel provision positively impacted productivity. However, their impacts on employment were limited to very large firms only. In addition, after observing the distributional impact of AGOA, we found evidence that AGOA's productivity impacts are due to resource allocation from less productive to productive firms as hypothesized by Bernard et al, (2007a).

The rest of the paper presents a brief literature review of AGOA and general trade impacts in section 2. In section 3 we discuss AGOA and the SSA textile industry. Section 4 covers both the data and the empirical specifications, while section 5 presents the results. The paper concludes, in section 6.

2. AGOA AND TRADE IN AFRICA

Much of SSA's trade with the world and the USA is still largely reliant on primary product exports, such as oil and other mineral fuels (68% of its exports to the world by value in 2008); ores and ash (about 14% by value); and precious stones (about 4% by value). Consequently, many SSA countries continue to be vulnerable to the rise and fall of international commodity prices. In 2009, SSA accounted for slightly more than 1.4% of US merchandise exports, and 3% of US merchandise imports; of which nearly 81% were petroleum products. Between 2001 and 2009, US imports from SSA grew by an average rate of 16%, an increase over the 4.6% annual growth rate between 1995 and 2000. Some of this growth could be attributed to AGOA. In fact, since 2001, the US has been granting exclusive lower trade tariffs to African countries that have adopted certain market based policies. From increased trade, we can also anticipate an increase in employment and/or productivity, however, no evidence has supported this hypothesis in AGOA's case.

Most, if not all, empirical analyses of AGOA's impact focus on measuring its impact on African trade, specifically exports from SSA to US. Nouve and Staatz (2003) estimated AGOA's impact on SSA's agricultural exports to the US using a gravity trade model. Although AGOA was found to have a positive relationship with agricultural exports, the statistically insignificant coefficients could not confirm the existence of an uncontested relationship. One reason cited for these inconclusive results is premature analysis, considering AGOA became effective in 2000. However, AGOA's marginal effect on SSA's agricultural exports to the US suggests that efforts are needed to reinvigorate the initiative and make it responsive to Africa's need for agricultural export expansion and diversification.

Using an ex-post approach, Mattoo *et al.* (2003) sought to predict the impacts of AGOA using information on pre-AGOA tariffs and assumptions on supply response. They predicted that AGOA will provide real opportunities to SSA. Even on conservative estimates

on SSA's supply response, SSA's non-oil exports could be increased by about 8-11%. However, the medium-term gains could have been much greater if AGOA had not imposed certain conditions and excluded certain items from its coverage. The most important condition is the stringent rule-of-origin, which requires that exporters source certain inputs from within SSA or the US. Mattoo *et al*. (2003) suggest that the absence of these conditions would have magnified the impact nearly five-fold, resulting in an overall increase in non-oil exports by $0.54 billion compared with the $100-$140 million increase that is expected in the presence of these restrictions. These restrictions, particularly on apparel, came at an inopportune time as SSA was exposed to competition from other developing countries following the elimination of quotas on the latters' exports under the Multi-Fiber Arrangement (MFA)[2]. In that regard, they predicted a reduction in SSA's apparel exports by over 30% with the dismantling of the MFA; if, on the other hand, AGOA had provided unrestricted access, they argued that the negative impact of the dismantling could be nearly fully offset.

More recently, Frazer and Van Biesebroeck (2010) estimated the impact of AGOA on trade volume. Unlike previous analyses, the authors' approach controlled for bias related to both country and product-level import surges that may not be related to AGOA. Their results state that AGOA led to an increase in US imports from SSA, especially for apparel products where imports grew by 42%. In addition, the authors noted that AGOA led to an increase in the number of products exported to the US. This effect was more prevalent in the agricultural and manufacturing sectors. AGOA had a disproportionate impact on products that enjoyed the largest tariff reductions, particularly for apparel. The authors found that unlike many suspected, the increased exports to the US do not represent exports being redirected from Europe or Africa's other major export destinations. This further implies that AGOA has created new production opportunities in SSA.

Improving SSA exports is not AGOA's end goal. Its ultimate goal is to improve the wellbeing of Africans and African institutions by providing growth opportunities through trade. The present article seeks to contribute to literature assessing AGOA by evaluating its impacts on firm-level employment and productivity. AGOA's apparel provision is its most popular component. Much evidence shows that it has helped many SSA countries by attracting foreign direct investment (FDI) and has ameliorated the prices exporters receive from their USA buyers. In the next section, we will contextualize AGOA and SSA's apparel industry as a step towards this article's objective.

3. THE AFRICAN APPAREL INDUSTRY AND AGOA

SSA has a very small spinning industry (only 0.01% of total global spinning capacity).[3] Cotton yarn (including cotton/manmade-fiber blends) is mostly produced for export to the US and the EU, as well as for downstream production of apparel for export to these markets (see basic definitions of key terms in Table 1). In 2009 Nigeria was the largest exporter of cotton yarn (US$ 21 million), followed by Zimbabwe (US$ 7.6 million) and Tanzania (US$ 7 million).[4] However, the total value of SSA cotton yarn exports in 2009 was US$ 50 million compared to US$ 1.3 billion from India (See Table 2).

[Table 1 here]

[Table 2 here]

The African textile/apparel industry appears to have benefited from the US market access opportunities permitted by AGOA. Apparel exports from all SSA countries to the US increased from $584 million in 1999 (before AGOA) to nearly $1.8 billion in 2004 ($1.5 billion qualified for AGOA benefits). Several countries, including Kenya, Lesotho, Namibia, Madagascar, South Africa, and Swaziland, experienced a pronounced rise in apparel exports.

The act appeared to have resuscitated Kenya's languishing export process zones (Rolfe *et al.*, 2004). Notably, Kenya's clothing exports to the US increased 607% between 1999 and 2004. Another significant success case is Lesotho, which saw exports rise by 311% after AGOA, making this small, land-locked country the largest African garment exporter to the US. By attracting FDI from Asia to its industrial estates, Lesotho's garment exports surpassed many other developing nations in the 1990s, including neighboring South Africa. AGOA then led to even more impressive growth. By 2003 the country's apparel exports to the US surpassed Mauritius, often celebrated as SSA's most successful export model.

Some countries developed garment export industries that did not exist before AGOA's enactment. For example, Namibia had no apparel exports to the US prior to 2000, even though it had an active export process zones program and an excellent port. Four years after the enactment of AGOA, its garment exports to the US exceeded $78 million. In 2003 for instance, Ramatex, a Malaysian corporation, built a garment-manufacturing plant employing over 7,000 workers (Rolfe and Woodward, 2005).

Despite these encouraging improvements, many will argue that the apparel provision did not live up to its initial expectations. In a perfectly competitive market under AGOA, exporters should capture the tariff revenue that used to go the US Treasury through higher prices on their products. Olarreaga and Ozden (2005) sought to measure the magnitude of this higher price using the case of apparel exporters and found that AGOA exporters capture only around 1/3 of the potential benefit. Among the benefactors, they found a wide variance with smaller and newer exporters capturing less tariff rent than larger and more established ones. This sub-optimal impact is mostly due to the market power of large importing US companies in the world market. Further evidence of this tariff rent sharing between exporters and

importers were also found by Krishnan, Erzan and Tan (1994) in the context of apparel quotas from various East Asian countries.

The survival of the present day African textile and clothing industry is closely linked to the expiry of the Agreement on Textiles and Clothing (ATC) which was enacted on January 1st, 2005. The expiry of the ATC marked the end of a 40-year period, during which much of the global textile and clothing trade was subject to a special regime centered on a politically motivated quota system. With the end of the quota system, the textile trade moved towards World Trade Organization (WTO) agreements, becoming an integral part of the WTO system, governed by the general rules and principles of this multilateral trading system.

[Figure 1 here]

Consequently, SSA-made textiles lost exclusive access to the US market after the expiry of the ATC. As presented in Figure 1, the value of textile imports from SSA to the US has decreased dramatically. Between 1995 and 2004, textile imports from SSA to the US grew at an average annual rate of 13%. But, after the expiration of the ATC; it grew by an average rate of 11% between 2005 and 2010 implying a 50% decrease in the value of textile imports from SSA to the US and more than the conservative estimate of 30% made by Mattoo *et al.* (2003), as discussed in Section 2.

4. DESCRIPTIVE STATISTICS AND METHODOLOGY

(a) Descriptive statistics

We analyzed the impacts of AGOA using the World Bank's Enterprise Surveys (WBES). The WBES collect information about firms' characteristics, the nature of the business environment, how it is perceived by individual firms, how it changes over time, and about the various constraints to firm performance and growth. The surveys cover more than

100 indicators from 110 countries and have been running since 2002. The dataset is appropriate for our analysis because firms are heterogeneous; they are divided by sector, size, and proximity to the capital city. Furthermore, the detailed dates of countries eligibility to AGOA and its special apparel provisions were taken from the AGOA website.

Based on the information presented in Table A1 in the Annex, the analysis was undertaken as follows: For the first policy, impact of AGOA eligibility on firm employment and productivity, there were three countries in the control group and two in the treatment group. For the second policy, impact of AGOA's apparel provision, there were nine control countries and three treatment countries. The base year observations are recollections mostly taken from accounting books. Due to data limitation, countries such as Madagascar, Kenya, Namibia, Lesotho, and Mauritius, which have had clear success with AGOA apparel provisions, are not included in the analysis, and we anticipated that their unintentional exclusion would affect the robustness of some of the results.

The descriptive statistical results suggest that 52% of the firms are located in the capital city. The average number of permanent employees per firm is 34 with a maximum of 690. Average annual revenue of firms is about $0.5 million with a maximum of about $700 million as more than 8% of all the firms are multinational. Many industries are represented in our sample and 9% of all firms are textile firms. We estimated productivity here as the ratio between revenue and number of permanent employees. The results show that average productivity is about $19,768 per worker per year with a maximum of $10 million per worker per year[5]. On average, the first year of operation of firms is 1996 where the oldest and youngest firms are recorded to have opened up in 1905 and 2008 respectively. The average number of years of experience of the highest ranked manager is 10.9 years with a maximum of 55 years. Lastly, there are three types of firms, notably small (<20 employees), medium

(20-99 employees), and large (100 and over employees). Out of the total number of firms used, 76.79% are small, 19.86% are medium, and 3.92% are large.

[Table 3 here]

Using kernel density function, we approximated the distribution of the natural log of the difference between employment in AGOA countries and non-AGOA ones and compared the distributions between the base year and the follow-up year to draw preliminary inferences about the impact of AGOA in Figure 2. Although the graphs look similar, the follow-up year difference distribution seems to have a larger Kurtosis. However, the minor difference leads us to anticipate a minimal impact of AGOA on employment.

[Figure 2 here]

We approximated similar distributions for the case of productivity and found the distribution difference between to be more pronounced. This implies that AGOA may have had impacts on the productivity distribution.

[Figure 3 here]

We estimated similar distributions for the case of textile firms and found the distribution of differences in employment to be less impacted by the apparel provision. However in the case of productivity, the distribution difference seems to have been affected by the apparel provision as seen in Figure 5.

[Figure 4 here]

[Figure 5 here]

These preliminary comparisons demonstrate that AGOA and the apparel provision have changed the distribution of firm productivity. However, further analysis is necessary to control for other variables including spillovers and the possibility that the policies may be endogenous.

(b) Empirical model specification

We sought to estimate the impact of AGOA and its apparel provision by comparing the outcomes before and after the implementation of the policies. We further compared the outcomes between firms of AGOA eligible countries those of non-eligible ones through a difference-in-differences approach. The conventional difference-in-differences specification is presented in equation (1) below:

$$Y = \beta_0 + \beta_1 * D + \beta_2 * T + \beta_3 * (D*T) + \beta_4 * X + \varepsilon \tag{1}$$

The variable Y represents firm outcome, D is a dummy variable such that $D = 0$ in the base year and $D = 1$ in the follow-up year. T is the treatment variable such that $T = 1$ if a firm is in the treatment group and $T = 0$ otherwise, and X is a vector of control covariates. The impact of the policy is captured by the coefficient of the interaction term β_3.

(c) Difference-in-difference-in-differences estimator

Since AGOA is a country level policy and we are interested in evaluating its impact on firm level outcomes, we cannot control for country level confounders while using specification (1). Second, since the data used in this analysis are non-experiment data, a matching approach is recommended to address the non-random nature of the data (Dehejia

and Wahba, 2002). However, the country-level nature of the treatment limits the usefulness of a matching approach (i.e. collinearity between the country dummy and the treatment variable will arise). Therefore, we use a DDD specification to introduce within country heterogeneities and manually match firms given firm-level-observables. This procedure will also effectively single out the impact of the policies by controlling for country level and industry level confounders in the following manner:

Medium and large exporting firms are those that are more likely to benefit the most from AGOA, therefore we alienate country level confounders by evaluating how the impact of AGOA differs between medium and large exporting and other firms. On the other hand, in the case of the apparel provision, we follow the same concept as proposed for the case of AGOA but using textile firms instead of medium and large export firms because the provision was targeted specifically to textile firms. To do this, we first create a new dummy variable I, such that $I = 1$ if firm is a medium or large exporting one for the AGOA evaluation (or in the textile/apparel industry for the apparel provision evaluation) and $I = 0$ otherwise. The DDD model specification is such that:

$$
\begin{aligned}
Y = {} & \beta_0 + \beta_1 * D + \beta_2 * T + \beta_3 * I + \beta_4 * (D*T) + \beta_5 * (D*I) + \beta_6 * (I*T) + \\
& \beta_7 * (D*T*I) + \beta_8 * X + \varepsilon
\end{aligned}
\tag{2}
$$

The coefficient of the usual DD is β_4, it evaluates the impact of the policy without controlling for the country level and industry level confounders. The coefficient of the triple interaction term β_7 is the coefficient of interest here; it measures policy impact on the outcomes.

The nature of the DDD estimate can be explained as followed: we define EF and AC as a medium or large exporting firm and an AGOA eligible country, and NF and NC as non-exporting firm and non-AGOA country, respectively. The DDD used to measure the effect of AGOA is such that:

$$DDD = [(Y_{D=1}^{AC,EF} - Y_{D=0}^{AC,EF}) - (Y_{D=1}^{AC,NF} - Y_{D=0}^{AC,NF})] - [(Y_{D=1}^{NC,EF} - Y_{D=0}^{NC,EF}) - (Y_{D=1}^{NC,NF} - Y_{D=0}^{NC,NF})] \qquad (3)$$

This procedure is further beneficial because it allows the analysis to account for possible externalities. In fact, targeted firms work with other firms who supply inputs or complementary services such as logistics, accounting, accommodation, etc. For that reason, AGOA and its apparel provision will have unintended effects on those non-targeted firms and failing to account for them will bias the evaluation of the true impact of the policy. In addition to comparing the results between the treatment and control country, the DDD approach allows us to account for these externalities by comparing the policy impact between the intended and unintended targets within the counties.

(d) Endogeneity of AGOA eligibility

One may reasonably argue that the treatment, eligibility to AGOA is endogenous since a country's eligibility is dependent of its past implementation of market based policies, its political stability, human right records and so on. To verify this claim, we estimated a Durbin-Wu-Hausman (DWH) test using the Heritage Foundation Economic Freedom Index as instrument. This is an index composed of 10 sub-indices including business freedom, trade

freedom, fiscal freedom, government spending, monetary freedom, investment freedom, financial freedom, property right, freedom from corruption, and labor freedom.

We use the average of the index between 1995 and 2000, the period before the first country became eligible for AGOA. The DWH test consisted of three stages. We first estimated a reduced form regression with the suspected endogenous variable as the dependent variable and all the exogenous variables using a Linear Probability Model (LPM) in the first stage. The use of the LPM model is justified here because it frees us from imposing a functional form (Angrist and Krueger, 2001). Second, we saved the residual from the above regression and included it in the main equation, and thereafter estimate the main equation by OLS. Third, we test the significance of the coefficient of the added residual.

The Durbin-Wu-Hausman test showed that using the dummy for eligibility to AGOA gives consistent results, implying that it is not necessary to correct for an endogeneity problem. Considering that AGOA eligibility is mostly used to lure countries to adopt market-based policies and may necessitate a discretionary presidential decision, SSA countries' efforts towards free market policies may not be the determinants of AGOA eligibility.

(e) Censored distribution

More than 12% of the firms considered in this analysis were not operational prior to their country of operation's eligibility under AGOA. Therefore, the dependent variables of those firms in the base year are equal to zero. Failing to account for this may bias the results because a good number of the observations are in the minimum.

Suspecting the existence of a correlation between the employment and productivity error terms, we initially estimated a Bivariate Tobit using the Geweke-Hajavassiliou-Kearne (GHK) smooth recursive estimator. However, because the correlation coefficient of the error

terms was not statistically significant, we estimated specification (2) separately for each equation using a Tobit model.

5. RESULTS

(a) Impact of AGOA eligibility

Table 4 below presents the results of the impact of AGOA on employment. In addition to the main specification, we estimated quantile regressions in order to get a complete picture of the impact of the policy at different points of the distribution. On average, we found that AGOA has a positive impact on employment, but this positive impact disappears when we control for the country confounders using the DDD identification. Furthermore, the age of the firm and the size of the firm are positively correlated with employment, and statistically significant. The relationship between the number of years of experience of the firm's top manager and employment is also positive and statistically significant. The quantile regressions reveal that AGOA negatively affected firms with employment in the 25th quantile while those in the 50th and 75th were not affected by the policy. We suspect that AGOA led small and inefficient firms to layoff due to the higher competition introduced by firms seeking to take advantage of the new trade opportunity.

Next, we calculated firm productivity by taking the ratio between firm revenue and number of permanent workers. This measures the average product of labor which is the average revenue contribution of each worker. With regards to productivity, we found that AGOA has had a positive impact on average firm productivity (see Table 5). Firm size is positively correlated with productivity, implying that medium and larger firms are more likely to have higher productivity. The relationship between first year and productivity is negative. This suggests that older firms are more productive. Last, the relationship between number of years of experience of top manager and productivity is inconclusive.

Bernard *et al.* (2007b) emphasize that the impact of trade liberalization on firm productivity will vary by firm size. Medium and larger firms will become more productive to the detriment of smaller ones. To test this hypothesis, we estimated quantile regressions to further understand how AGOA impacted firms at various points of the productivity distribution. The results confirm the hypothesis brought forth by Bernard *et al.* (2007b) that trade liberalization will lead to a reallocation of productive resources from less productive activities to more productive ones. In fact, we found that AGOA lowered productivity of less productive firms (those below the 10th percentile) and increased the productivity of productive ones (those in the 50th percentile). This is possible because new entrants often bring new technologies and pressure incumbent firms to improve productivity, thereby forcing inefficient incumbents to exit.

[Table 4 here]

[Table 5 here]

(b) Impact of apparel provision eligibility

Table 6 presents the results of the impact of the apparel provision on employment. Although firm size and the number of years of experience of the top manager have a positive relationship with employment, we found that the provision did not have a statistically significant impact on it. However, when looking at the quintile regressions, we notice that the provision negatively affected employment at the 25th and 50th percentiles, with a larger effect on the 75th percentile.

Table 7 presents the results of the impact of the apparel provision on productivity. Using results from the Tobit model with control, years of experience of the top manager is

positively related with productivity while first year of operation is negatively related to it. We found that the provision increase productivity and this was mostly driven by smaller firms. In fact, only firms whose productivity is in the 25th percentile were positively impacted by the provision while the rest were not impacted. Unlike the case of AGOA, the apparel provision's impact on productivity does not follow Bernard *et al* (2007b)'s hypothesis.

[Table 6 here]

[Table 7 here]

(c) Robustness check

Considering the inconclusive results from the evaluation of the apparel provision on employment, we initially hypothesized that the drop in textile trade between the USA and SSA caused by the expiry of the ATC may have undermined the effectiveness of the apparel special provision on firms. We performed a robustness check testing this by adding a dummy variable, atc, such that $atc = 1$ if ATC expired between the base and follow-up year, and $atc = 0$, otherwise. The results do not indicate that the expiry of the ATC had undermined the effectiveness of the impacts of the apparel provision.

[Figure 6 here]

We suspect that ATC did not have any statistically significant impact because, firstly, total textile exports from SSA to the world did not change after 2005 as illustrated in Figure 4. It has been increasing after 2005, implying a diversion of initially US-bound textile products to other locations. The only reason left to explain the lethargic results could be the exclusion of AGOA successful countries as suspected in Section 3. Furthermore, the less optimal price effect of AGOA on exporters could be the cause of this. Second, the powerful

market powers enjoyed by US importers have undermined the potential higher export price that African exporters were supposed to enjoy as a result of AGOA.

A potential concern with our analysis is its sensitivity to the definition of medium and large firms. We defined medium and large firm as firms with at least 20 full-time permanent employees. There are reasons to believe that the results may not be stable when choosing different cut-off points. We present results in Tables A2 and A3 below using cut-off points of 25, 30, 50, and 70 full-time permanent employees to verify the robustness of the main results.

In the case of employment, the coefficient β_7 remains statistically insignificant for the cut-off points of 25 and 30. However, β_7 becomes positive and statistically significant at the cut-off points of 50 and 70. We suspect that the weak stability of the employment coefficient may be associated with the omission of successful AGOA countries. For the countries used in the present analysis, only very large firms increased employment as a response to AGOA.

By way of productivity, β_7 is positive and statistically significant regardless of the cut-off points. The statistical and economic significance of the coefficients remains unaltered, however, the impacts somewhat increase when the cut-off point is increased. This implies that the impact of AGOA is proportional to the firm's initial productivity level.

6. CONCLUSION AND POLICY RECOMMENDATION

We evaluated the impact of general AGOA eligibility and apparel provision eligibility on employment and productivity. We hypothesized that AGOA would positively affect firm employment and productivity, second order effects of the policy. In order to effectively alienate the impact of the policies, address the limitations associated with non-experimental

data, and potential spill-over effects, we used a DDD specification to specifically account for both country level and industry level confounders in our empirical analysis.

Although AGOA's effects on employment were limited to very large firms only, evidence shows that it had robust effects on firm's productivity. AGOA's impact on aggregate firm productivity is due to a reallocation of resources from less productive firms to more productive ones. On the other hand, the impacts of the apparel provision eligibility on relative employment of textile firms were inconclusive. However, its impact on productivity was positive, but we did not find evidence that it positively affected productive firms to the detriment of the less productive ones.

Much evidence shows that AGOA has had a strong impact on trade volume, trade diversification, and now firm level productivity. But the extent to which AGOA impacted firms depends on the business environment in eligible countries. Important factors such as trade engagement, customs efficiency, business licensing and permits delays, and regulation burdens may have had influence on the extent to which firms benefited from AGOA. Further work needs to be done to determine how these factors may affect firms' ability to benefit from free trade opportunities.

On the other hand, the impact of the apparel provision on firm level employment in SSA countries is limited to very large firms. One reason for the lethargic results could be associated with the unintentional omission of AGOA-successful countries which may have undermined the robustness of the standard errors. Nevertheless, these results are sufficient to support an extension of the act's scope, coverage, and a renewal of AGOA's Third-Country Fabric Provision.

In the event AGOA is extended beyond 2015, several issues need to be addressed in order to improve the participation of African countries in the scheme, as exports to the US

benefiting under the current scheme are highly concentrated in a handful of countries and goods. Renewal should take into account major shortcomings to make AGOA more inclusive, accessible and permanent. Preferences ought to be strengthened, enhanced and improved so that trade and investment which so far rely on transient preferential market access may be channeled towards sectors with export potential in a durable manner. This is crucial, especially since of the 38 beneficiary countries, only a half have been able to seize opportunities under AGOA.

Even though AGOA has afforded FDI and productivity improvement opportunities in the textiles and apparel sector, there is little value added linked to these activities. However, value addition may afford African countries the opportunity to penetrate niche markets with growth prospects such as those of "fair" and "organic" trade. This will also require adequate technical assistance and capacity building.

As mentioned earlier, only half of the eligible AGOA counties have taken advantage of it. For future research, we plan to empirically evaluate the determinants of AGOA's participation. What are the roles of firm level and country level covariates in creating incentives for firms to participate in AGOA once the country has become eligible? Second, assuming that a firm has made the decision to take advantage of AGOA opportunities, what are its implications on the dynamics of wage earned by workers?

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NOTES

[1]Ianchovichina et al (2001) used a general equilibrium simulation model and found an increase of 0.6 per cent

(or $192 million) in non-oil exports for SSA countries as a group from preferential access to the US apparel

market. Lederman and Ozden (2003), using a gravity model, find that in aggregate AGOA countries export between 20 to 40 per cent more than excluded countries of similar economic and geographic characteristics.

[2]The Multi Fiber Arrangement governed the world trade in textiles and garments from 1974 through 2004, imposing quotas on the amount developing countries could export to developed countries. It expired on 1 January 2005.

[3]United States International Trade Commission (2009) 'Sub-Saharan African Textile and Apparel Inputs: Potential for Competitive Production'

[4]UN COMTRADE SITC Revision 3

[5]Note that we only used fulltime permanent employees (temporary and part-time workers were not used because of data limitation) and this large outlier may be from a multinational firm that has a small representation in the country. However, we remove the outliers before estimating our models.

ANNEX

Table 1: Basic definitions

Term	Definition
Apparel	Clothing (or garments) and made-ups (i.e. home furnishings such as bed linen and towels).
Cotton Fibres	Soft silky fibers from cotton plants in their raw state. A cotton fibre is classified in four ways; by its length, micronaire, strength and uniformity.
Cotton Yarn	Yarn is a long continuous length of interlocked fibers, suitable for use in the production of fabric or sewing thread.
Spinning	The action or process of converting fibres into thread or yarn
Textiles	A type of cloth or woven fabric (not specifically cotton)

Table 2: Cotton yarn exports

Country	Cotton yarn export (2009) USD
Nigeria	21 million
Zimbabwe	7.6 million
Tanzania	7 million
SSA	50 million
India	1.3 billion

Source: COMTRADE

Table 3: Descriptive statistics

Variable	Obs	Mean	S. D.	Min	Max
Capital city	4311	0.52	0.50	0	1
No of permanent employees	4311	34.44	97.91	0	690
Revenue ($)	3872	531963.4	8945193.0	0	7.37E+08
Textile	3781	0.09	0.28	0	1
Multinational	3533	0.08	0.27	0	1
Productivity	3532	19768.88	208190.20	0	1.11E+07
First year	4310	1996.64	8.69	1905	2008
Years of experience	4302	10.86	7.91	0	55
Firm size	3665	1.26	0.51	1	3
Small (<20 employees) =1	76.79%				
Medium (20-99 employees) =2	19.29%				
Large (100 and over employees) =3	3.92%				

Source: Author's calculations

Table 4: Impact of AGOA on employment

| Variables | Tobit | | Quantile Regression | | | | | | Tobit with control | |
| | | | 25th Quantile | | 50th Quantile | | 75th Quantile | | | |
	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value
Treated	-29.261***	0.00	-6.00***	0.00	-7.00***	0.02	-8.00	0.24	-22.90**	0.04
Year	-23.47**	0.03	-3.00**	0.03	-2.00	0.53	-2.00	0.79	-23.58**	0.03
Export	-2.69	0.66	0.00	1.00	0.00	1.00	3.00	0.78	-7.39	0.19
Treated*Year	23.19*	0.07	5.00***	0.00	3.00	0.47	5.00	0.61	23.27*	0.07
Treated*Export	59.12**	0.04	2.00	0.52	23.00***	0.00	112.00***	0.00	52.66*	0.06
Year*Export	8.51*	0.38	50.00***	0.00	38.00	0.14	-2.00	0.97	22.37**	0.03
Treated*Year*Export	-14.10	0.71	-47.00***	0.00	-11.00	0.68	-11.00	0.86	-27.94	0.43
First year									-0.71**	0.00
Experience									0.92**	0.02
Size	57.62***	0.00	16.00***	0.00	24.00***	0.00	58.00***	0.00	51.36***	0.00
Constant	32.03**	0.02	9.00***	0.00	12.00***	0.00	15.00***	0.01	1424.15***	0.00

* $p < .10,$ ** $p < 0.05,$ *** $p < 0.01$

Table 5: Impact of AGOA on productivity

Variables	Tobit		Quantile Regression						Tobit with control	
			25th Quantile		50th Quantile		75th Quantile			
	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value
Treated	1209.84	0.88	-1666.67***	0.00	-3295.65	0.14	-4940.272	0.63	4295.99	0.62
Year	1647.33	0.79	1571.43***	0.00	2266.95	0.36	0.00	1.00	1330.75	0.84
Export	19377.34	0.31	46.63	0.90	4399.72	0.15	10101.01	0.46	16643.46	0.40
Treated*Year	16966.21	0.19	-1567.75***	0.00	-2000.96	0.51	4118.50	0.76	17740.70	0.18
Treated*Export	-35642.23	0.20	-837.65	0.18	-4502.76	0.38	18311.30	0.43	-43455.01	0.11
Year*Export	-74358.57***	0.00	2352.97	0.23	-7452.13	0.65	-61372.15	0.40	57833.68*	0.10
Treated*Year*Export	81500.14**	0.02	-2350.03	0.26	33623.71**	0.04	75605.25	0.97	65107.78*	0.07
First year									-1068.76**	0.02
Experience									70.95	0.82
Size	67495.61***	0.00	843.78***	0.00	3933.62**	0.02	45631.4***	0.00	62639.15***	0.00
Constant	-7680.23	0.19	2111.11	0.00	3333.33*	0.08	12121.21	0.16	2123009**	0.02

$^{*}\,p < .10,\,^{**}\,p < 0.05,\,^{***}\,p < 0.01$

Table 6: Impact of apparel provision on employment

Variables	Tobit		Quantile Regression						Tobit with control	
			25th Quantile		50th Quantile		75th Quantile			
	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value
Treated*Year	7.27	0.17	0.00	1.00	1.00	0.24	1.00	0.54	7.01	0.19
Treated*Textile	-19.89	0.38	0.00	1.00	-14.00***	0.00	-18.00***	0.00	-20.44	0.37
Year*Textile	-8.34	0.67	4.00**	0.02	10.00	0.11	47.00***	0.00	-4.71	0.81
Treated*Year*Textile	31.06	0.38	-4.00**	0.04	-12.00*	0.10	-45.00***	0.00	27.73	0.43
Textile	-1.09	0.76	0.00	1.00	0.00	1.00	-1.00	0.47	-0.12	0.97
Treated	-12.93***	0.01	-1.00***	0.00	-1.00*	0.10	0.00	1.00	-9.63*	0.08
Size	31.31***	0.00	-3.00***	0.00	13.00***	0.00	29.00***	0.00	31.28***	0.00
Year	-39.49***	0.00	1.00***	0.00	1.00	0.16	0.00	1.00	-39.50***	0.00
First year									-0.08	0.67
Experience									-0.33**	0.02
Capital city									5.31*	0.06
Constant	44.04***	0.00	5.00***	0.00	6.00***	0.00	10.00***	0.00	217.36	0.60

$^{*}\,p<.10,\,^{**}\,p<0.05,\,^{***}\,p<0.01$

Table 7: Impact of apparel provision on productivity

Variables	Tobit		Quantile Regression						Tobit with control	
			25th Quantile		50th Quantile		75th Quantile			
	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value
Treated*Year	-29391[*]	0.08	519.32[***]	0.01	1153.04[***]	0.00	1504.50	0.18	-28862.92[*]	0.08
Treated*Textile	-54446.4[**]	0.04	-1574.45[**]	0.03	1773.61	0.23	-3426.84	0.43	-43965.26[*]	0.07
Year*Textile	-61301.4[*]	0.10	-1350.72	0.30	-3019.03	0.27	-6717.73	0.40	-81594.59[**]	0.05
Treated*Year*Textile	85404.56[*]	0.07	3239.03[**]	0.04	1753.17	0.60	6291.98	0.51	104009.70[**]	0.04
Treated	-4258.01	0.35	-6.02	0.96	-911.19[***]	0.00	-4565.06[***]	0.00	4895.53	0.31
Year	31196.54[*]	0.06	-7.64	0.96	-562.13[**]	0.08	-776.76	0.40	33405.21[**]	0.05
Textile	-581.75	0.89	-313.85[**]	0.04	-1515.15[***]	0.00	-3066.67[***]	0.00	-4066.62	0.33
First year									-2043.91[**]	0.03
Size	13492.98[*]	0.10	600.43[***]	0.00	2074.07[***]	0.00	7479.26[***]	0.00	3882.61	0.56
Capital city									4723.42	0.14
Experience									1502.58[**]	0.04
Constant	-3133.87	0.63	1293.9[***]	0.00	4320.27[***]	0.00	12237.31[***]	0.00	4054484.00[**]	0.03

[*] $p < .10$, [**] $p < 0.05$, [***] $p < 0.01$

Table A1: List of countries and group allocation

Country	Follow-up year	Base year	Policies		Group allocation	
			AGOA eligible	Apparel provision eligible	Policy 1	Policy 2
Burkina Faso	2006	2003	2004	2006	Trial	n/a
Burundi	2006	2003	2006		Control	Control
Chad	2009	2006	2000	2006	n/a	Trial
Congo, Dem. Rep.	2010	2006	2002	no	n/a	Control
Eritrea	2009	2006	no	no	Control	Control
Gabon	2009	2006	2000	no	n/a	Control
Guinea	2006	2003	2000	no	n/a	Control
Guinea-Bissau	2006	2003	2000	no	n/a	Control
Liberia	2009	2006	2006		n/a	Control
Mauritania	2006	2003	no		Control	Control
Nigeria	2007	2004	2000	2004	n/a	Trial
Rwanda	2006	2003	2000	2003	n/a	Trial
Togo	2009	2006	2008	no	Trial	Control

Source: http://www.agoa.gov/eligibility/country_eligibility.html, enterprisesurveys.org, and author's analysis.

Table A2: Employment robustness check

Variables	Employment							
	Cut-off at 25		Cut-off at 30		Cut-off at 50		Cut-off at 70	
	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value
Treated	-11.5838	0.199	-13.2882	0.126	-16.2886**	0.029	-19.505***	0.003
Year	-15.2526*	0.088	-16.2114*	0.064	-9.23161	0.206	-11.2414*	0.091
Export	-0.63975	0.89	-0.36242	0.939	5.174265	0.25	12.62946***	0.00
Treated*Year	15.51129	0.151	18.08513*	0.085	11.18754	0.206	10.66455	0.184
Treated*Export	37.51337	0.265	31.40266	0.37	-3.3464	0.933	-7.56432	0.86
Year*Export	-43.3767***	0.001	-58.2366***	0.00	-131.826***	0.00	-174.728***	0.00
Treated*Year*Export	20.05918	0.638	37.5945	0.40	113.7166**	0.026	129.4881**	0.017
Size	115.49***	0.00	129.2187***	0.00	186.7035***	0.00	222.2229***	0.00
Constant	13.27901**	0.044	15.09175**	0.016	18.68029***	0.00	23.11702***	0.00

* $p < .10$, ** $p < 0.05$, *** $p < 0.01$

Table A3: Employment robustness check

Variables	Productivity							
	Cut-off at 25		Cut-off at 30		Cut-off at 50		Cut-off at 70	
	Beta	p-value	Beta	p-value	Beta	p-value	Beta	p-value
Treated	4536.192	0.611	3673.149	0.676	-2656.89	0.736	-4292.27	0.572
Year	5029.189	0.357	4524.587	0.404	3244.543	0.49	971.7192	0.828
Export	20407.22	0.253	17542.38	0.303	13575.13	0.363	12595.24	0.351
Treated*Year	12838.1	0.323	13422.91	0.296	14146.01	0.261	15819.68	0.203
Treated*Export	-33477.8	0.238	-35970.3	0.213	-18712	0.564	-13906.6	0.713
Year*Export	-66340.3***	0.001	-69191.2***	0.001	-63342.8**	0.011	-70877.3***	0.01
Treated*Year*Export	79974.86**	0.046	90992.67**	0.032	96059.07*	0.065	99178.06*	0.085
Size	48073.74***	0.001	53016.62***	0.002	43308.03**	0.045	53201.94**	0.033
Constant	-1332.11	0.832	-54.6239	0.993	9052.881**	0.041	10589.83***	0.007

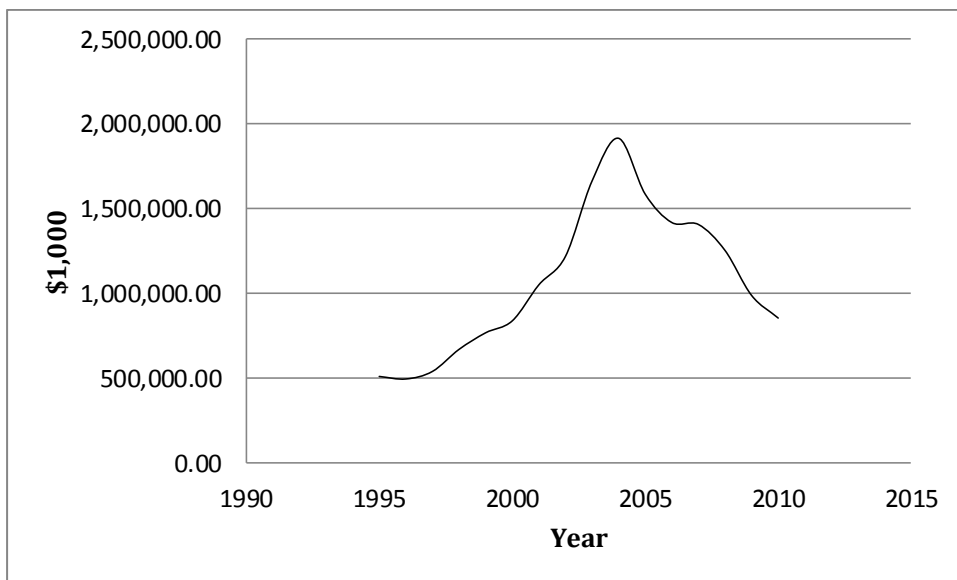$^{*} p < .10, ^{**} p < 0.05, ^{***} p < 0.01$

Figure 1: Value of USA textile import from SSA
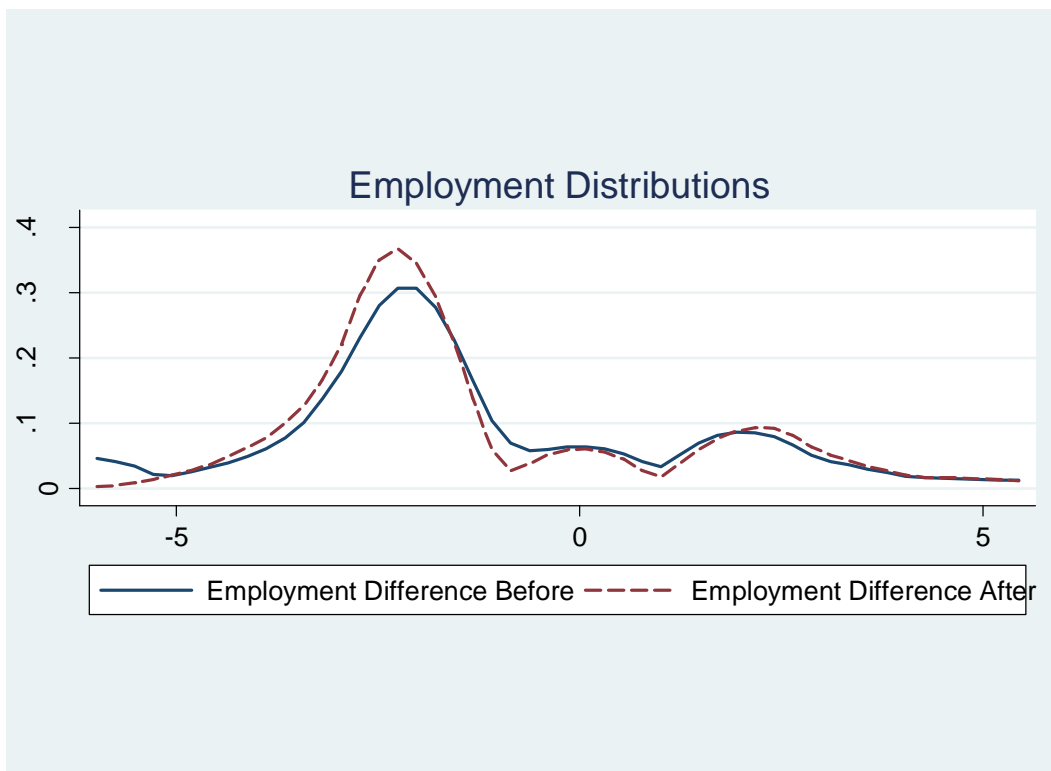Source UNCTAD

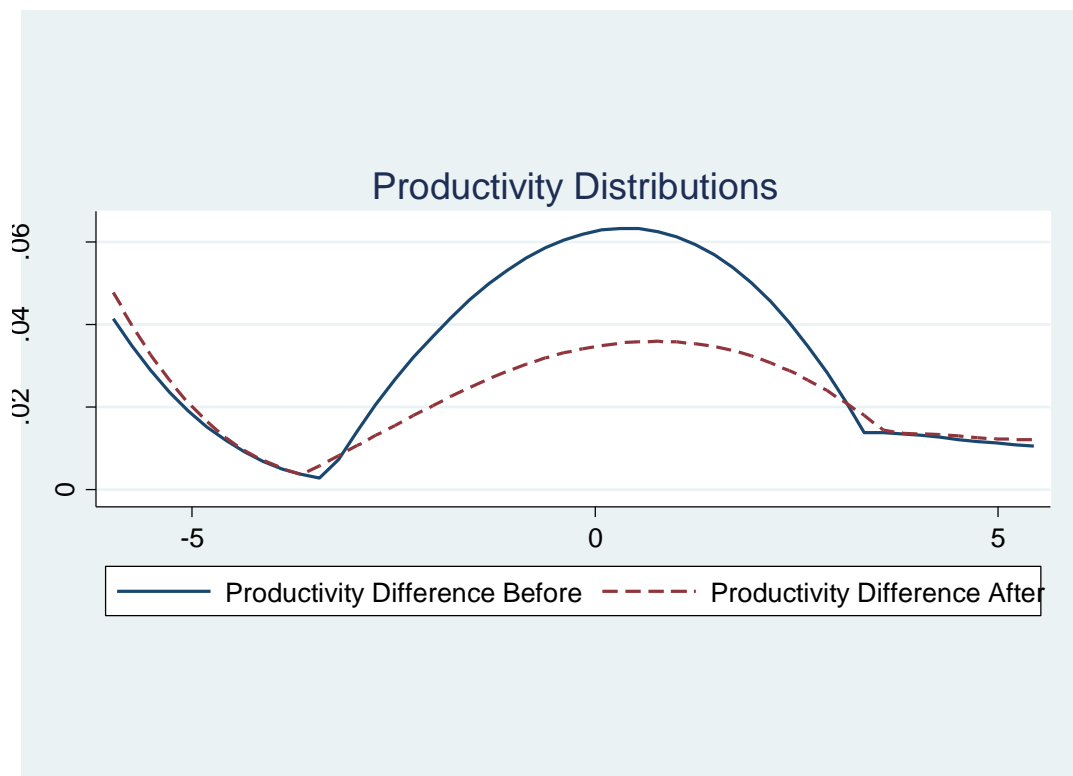**Figure 2: Employment distributions for AGOA countries**
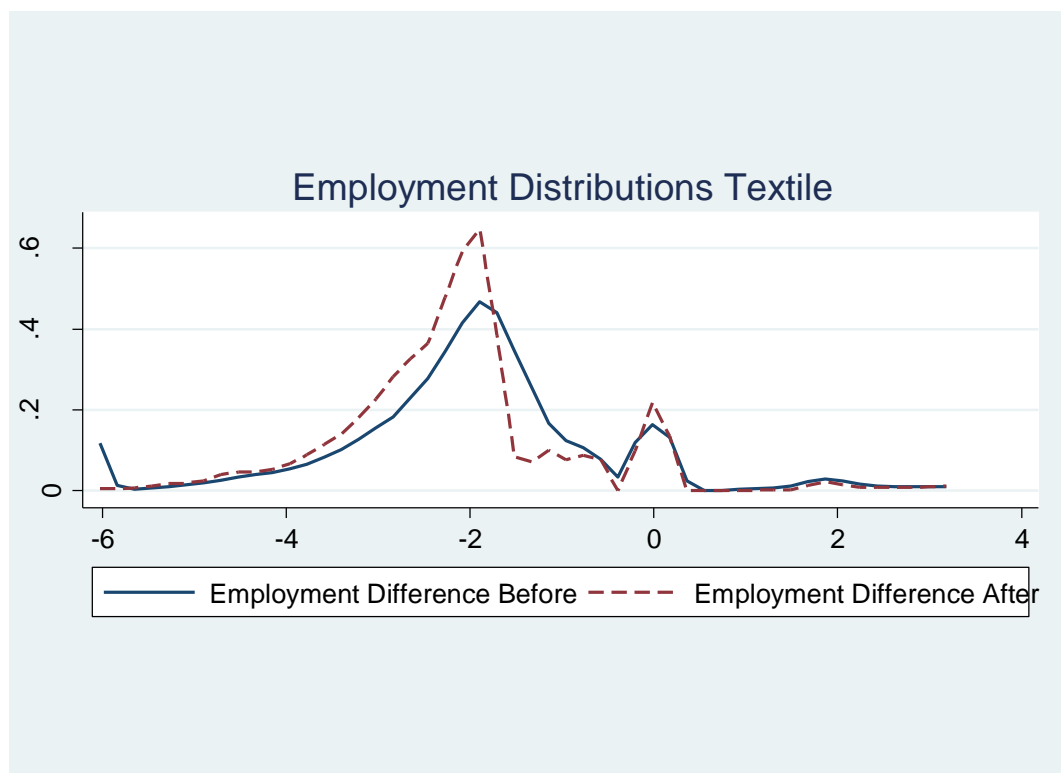
Figure 3: Productivity distributions for AGOA countries

Figure 4: Employment distributions for apparel provision countries
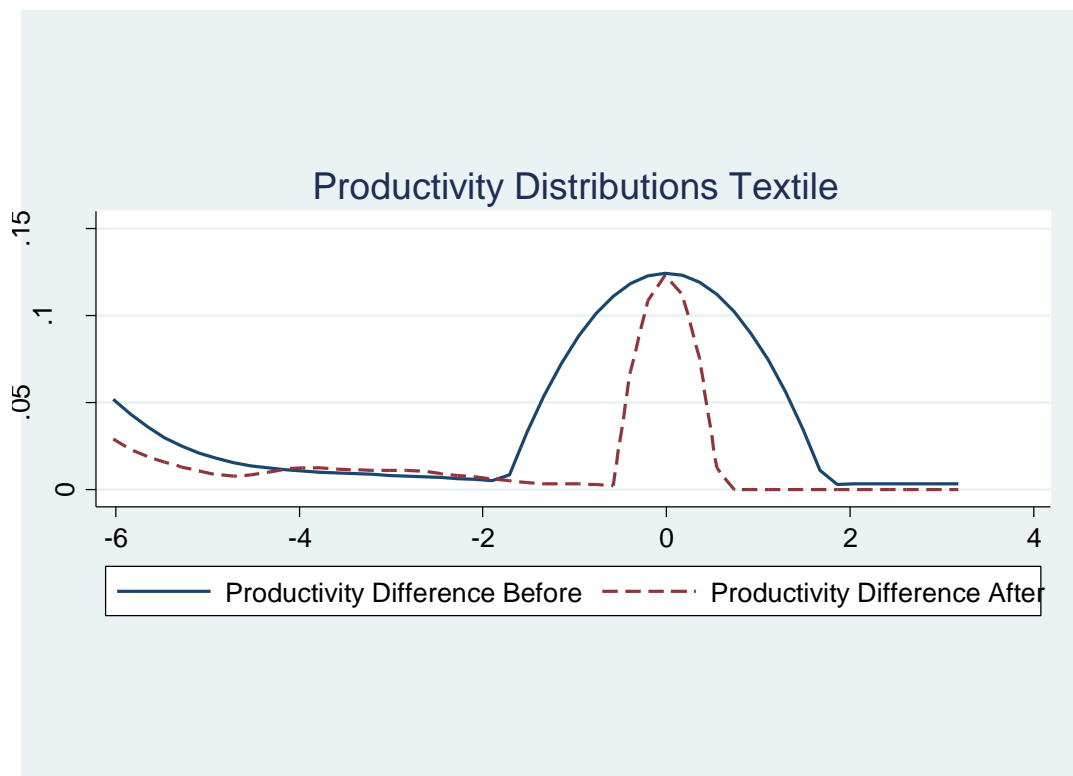
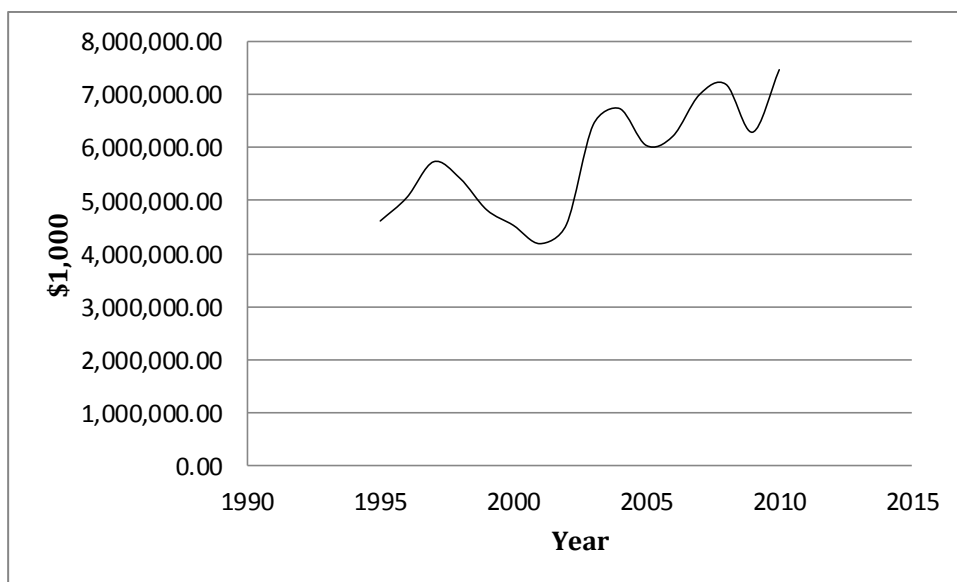**Figure 5: Productivity distributions for apparel provision countries**

Figure 4: SSA textile exports
Source: UNCTAD