UNIVERSITY OF CAPE TOWN | DEPARTMENT OF ECONOMICS

Rules of Origin and AGOA: The response of African clothing firms

Karmen Naidoo

Supervisor: Professor Lawrence Edwards

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Abstract

The development of the African continent remains one of today's greatest economic challenges. Focusing on the apparel sector, this paper uses firm-level data from several Sub-Saharan African countries and from eight Latin American and Asian countries for comparative purposes to investigate the impact of the AGOA apparel provision on African apparel firms. The paper seeks three main objectives: (i) to investigate the importance of access to imports to African firms; (ii) to evaluate the statistical significance and magnitude of the export supply response to AGOA; and (iii) to determine the impact of AGOA's Rule of Origin requirement on the composition of African clothing exports.

The paper is built around a firm-level mathematical model which shows how the rule of origin requirement effects the composition of AGOA-eligible apparel exports. In particular, the model illustrates how the special apparel provision of AGOA raises the demand for high fabric-intensive goods relatively more than the demand for low fabric-intensive goods. To estimate the impact of AGOA's apparel provision on African clothing firms, the paper uses a triple difference-in-difference approach, which exploits differences by country, time, and sector to allow a more convincing set of results than the traditional difference-in-difference model.

The first finding is that clothing exporters in AGOA-eligible countries are relatively more dependent on imported intermediate goods than exporters in other developing countries within South America and Asia. Secondly, it is found that AGOA-eligible countries exhibited positive apparel sales growth since the implementation of AGOA; however, the triple-difference model could not attribute this to the AGOA apparel provision with any significance, contrary to the literature. Lastly, through analyzing the contribution of value added to sales, in order to investigate the quality composition of exports, the results were ambiguous and represent an area for further study.

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I. Introduction

The development of the African continent remains one of today's greatest economic challenges. A commonly cited factor thought to hinder the development of Africa is the trade barriers imposed by high-income countries on the imports of commodities in which low-income countries are likely to have a comparative advantage; in particular, textiles and agriculture (Frazer and van Biesebroeck (2010), Oyejide (2010)). Through investigating the response of African clothing firms to one of the most important U.S. policies toward Africa of the past few decades – the African Growth and Opportunity Act (AGOA) – this paper explores the impact of the removal of trade barriers on Africa's export performance.

The UNCTAD Economic Development in Africa Report (2008) states that, despite the removal of most of the trade policy barriers thought to be the main restriction on export performance, the continent's export performance "fell short of expectations and the improvement has been small relative to the experience of the other developing regions." The report states that Africa's market share of world exports has declined from 6 percent in 1980, to nearly 3 percent in 2007. In particular, the ratio of manufacturing exports to total exports for the period 2000-06 is, on average, 26 percent – the lowest share of all developing regions. Over the same period, the manufacturing export share of total exports in East Asia, South Asia, and South America were 92 percent, 56 percent, and 54.5 percent respectively.

This paper is focused on the apparel industry, which is of particular importance within the context of African development or industrialization since it is the industry that has spurred manufacturing throughout the world. The apparel industry is typically the first stage, or 'starter' industry, for countries involved in export-oriented industrialization; and the newly industrialized East Asian economies – having seen remarkable apparel export gains over the past two decades – provide supporting evidence (Gereffi (1999), Morris (2006b)). Even more relevant to Africa are the experiences of selected South American countries, which have achieved significant apparel export growth as a result of preferential market access to the U.S. through the North American Free Trade Agreement (Rolfe and Woodward, 2005).

Furthermore, the apparel industry provides significant gains for labour. Apparel production is seen to be particularly suited to developing countries since it provides entry-level jobs for low-

and semi-skilled labour, along with the comparatively low investment cost of the required technology (Morris, 2006b). In addition, it has been widely documented that the textile and clothing industries have been an important source of employment for women (Baylies and Wright (1993), Nicita and Razzaz (2003)). Therefore, these industries are all the more important for African economic development since, according to Standing (1989) (as quoted by Baylies and Wright, 1993); a development strategy based on export-led industrialization has not been successfully pursued without relying on a 'huge expansion of female labour'.

Given the importance of African development; AGOA, implemented on October 2, 2000, was designed to grant unilateral trade concessions to the majority of sub-Saharan African countries by the United States. President Clinton declared 34 sub-Saharan African countries eligible for the trade benefits of AGOA and after subsequent eliminations and additions to the list of eligible countries, the current number stands at 40[1].

Trade preference schemes, like AGOA, have two main elements: (i) the trade preference; and (ii) the constraints on participation (Collier and Venables, 2007). The first element is the granting of market access at reduced rates, or as in the case of AGOA, duty-free market access. The second element defines the eligible countries and products, as well as imposes rules of origin (ROOs), which often limits sources of intermediate goods for manufacturing. According to Collier and Venables (2007), these elements are often in conflict, with the "constraints severely reducing the effectiveness of preferences as an instrument of economic development". In an attempt to investigate the impact of AGOA on African apparel firms, this paper will focus on both the change in the quantity of apparel exports as a result of the duty-free market access; as well as the change in composition (quality) of these exports as a result of the ROOs.

In terms of product eligibility, AGOA allows duty free imports under two broad categories – apparel and non-apparel. Duty-free access for apparel exports from an AGOA eligible country is not automatic, countries first need to be declared eligible for the apparel provision. In essence, for non-apparel items, trade concessions are applied uniformly across countries eligible for AGOA; however, for apparel items, they differ across AGOA-eligible countries. Therefore, this

[1] http://www.agoa.gov/agoalegislation/index.asp

product and country variation in eligibility provides an appropriate environment in which to isolate the impact of AGOA.

A focus on apparel sector exports is thus of particular importance in evaluating the relationship between trade and development. This paper represents a firm level analysis of the effect of AGOA on apparel exports in several Sub-Saharan African (SSA) countries – Botswana, Ghana, Kenya, Lesotho, Mauritius, Mozambique, Senegal, South Africa, Swaziland, Tanzania, Zambia. Comparative analysis is also conducted using eight South American[2] and Asian[3] countries. A focus of the paper is the relationship between imports and exports in African firms. In particular, this paper seeks three main outcomes:

1. To investigate the importance of access to imports to African firms, especially to exporting firms.
2. To use econometric methods to evaluate the statistical significance and magnitude of the export supply response of African clothing firms to AGOA.
3. To determine the impact of AGOA on the quality of African clothing exports through comparing the level of value added in African firms to that in firms originating in the comparator countries.

The first objective is important when evaluating the impact of AGOA on the export performance of African clothing firms. A high dependence of African apparel firms on cheap imported fabric will have significant implications for export performance given AGOA's less restrictive ROOs for least developed countries (LDCs). Not only is this expected to impact the export supply response of African firms but it may also have implications for the composition of exports, which will be discussed further on.

Following Frazer and van Biesebroeck (2010), the selective implementation of AGOA across both countries and products allows for the application of a triple difference-in-difference estimation technique to estimate its impact; where we can control for both country and product level import surges at the time of its implementation. Addressing the endogeneity critique; Besley and Case (2000) compare the different methods used in incidence analysis to exploit the

[2] Argentina, Bolivia, Chile, Colombia, Ecuador, Mexico, Peru, and Uruguay.
[3] Bangladesh, China, India, Indonesia, Malaysia, Sri Lanka, Thailand, and Vietnam.

variation in state policy, with a focus on the ability of these methods to adequately deal with the consequences of policy endogeneity. They suggest that the accuracy of the difference-indifference approach rests on the quality of the chosen 'control'[4] group. Therefore, the triple difference-in-difference approach better deals with the endogeneity critique of standard difference-in-differences estimation, compared to if either a country or a product level analysis were to be performed separately (Frazer and van Biesebroeck, 2010).

Lastly, we focus on, not only the export volume response to AGOA, but also the composition of the supply response. In other words, we ask the questions: How does AGOA affect the type of clothing goods exported by African firms? Does the third-country fabric provision affect the level of value added in clothing exports from African firms?

The remainder of the paper is structured as follows: Section II provides some background into Africa's clothing trade with the U.S., before the implementation of AGOA. Section III discusses the implementation of AGOA and explains its Rules of Origin. Section IV reviews the literature on the impact of AGOA on African clothing exports and presents the contribution of the paper to existing literature. Section V presents the mathematical model which forms the theoretical background to this investigation. Section VI is broken into three parts for investigating each of the above-stated objectives and provides a descriptive data analysis, presents the econometric estimation model, and discusses the result. Section VII concludes.

[4] "… 'control' groups must meet certain conditions to yield unbiased estimates of the impact of policies using differences-in-differences estimation."

II. Before AGOA: Africa's clothing trade with the U.S.

Mattoo, Roy, and Subramanian (2003) examine the data on the value, growth, and composition of sub-Saharan African exports over the period 1990-1999 and highlight four main features. First, the absolute level of non-oil exports is very low – approximately US$ 27 billion 1999 – and reflects a low rate of growth during the 1990s. These non-oil exports grew at 0.6 percent per annum and are consistent with the notion of Africa's marginalization from global trade (Collier (1995), Ng and Yeats (1997), Coe and Hoffmaister (1999)).

Second, while the United States accounts for 23 percent of Africa's exports in 1999, it is a much smaller market for non-oil exports (7.4 percent); thus the majority of SSA's exports to the U.S. are comprised of oil and related products.

Third, SSA's exports are dominated by agricultural and natural resource-based products, with manufacturing contributing only 12 percent to total exports (the composition of exports not changing much over the 1990s). Importantly, the clothing sector has been the most dynamic over this period, growing at an annual rate of almost 7 percent and has become one of the largest export items.

Lastly, in 1999, exports of clothing to the U.S. are highly concentrated – a few countries in the South African Customs Union and Mauritius accounting for 80 percent of SSA's exports; and Madagascar, Kenya, and Zimbabwe a further 17 percent of exports.

Focusing on the fast-growing textiles and clothing sector, Table 1 closely examines the composition of these exports. Africa's export share of total developing economy exports in each category shows declining shares in the textile and yarn category and in clothing and accessories, with the only positive results in textile fibres (the category with the least value added). It must also be noted that Africa contributes a remarkably small share to total exports of clothing and textiles – consistent with the idea of Africa's marginalization from international trade. Overall, Asia continues to dominate world clothing and textile exports and South America has shown remarkable growth over this period. The positive for Africa is a higher average annual growth rate relative to Asia over the same period.

Table 1: Developing Economy Exports of Textiles and Clothing to the U.S (US$ thousands).

				Export share (%)		
		1995	**1999**	**1995**	**1999**	***Annual Average Growth 1996-1999***
Textile fibres	Africa	6,472	21,239	1.05	4.69	53.72
	America (Central and South America)	401,416	198,064	65.01	43.74	-15.53
	Asia	209,599	233,501	33.94	51.57	2.93
	Total	617,487	452,804	100.00	100.00	
Textile yarn and related products	Africa	123,439	125,976	2.07	1.47	6.58
	America (Central and South America)	1,243,226	2,324,780	20.85	27.17	17.23
	Asia	4,597,419	6,106,538	77.09	71.36	7.38
	Total	5,964,084	8,557,294	100.00	100.00	
Clothing and accessories	Africa	576,441	808,097	1.78	1.76	9.26
	America (Central and South America)	6,769,880	13,743,201	20.86	29.87	20.37
	Asia	25,110,302	31,462,689	77.37	68.38	5.85
	Total	32,456,623	46,013,987	100.00	100.00	
Total Clothing and Textiles	Africa	706,352	955,312	1.81	1.74	8.60
	America (Central and South America)	8,414,521	16,266,045	21.55	29.56	18.67
	Asia	29,917,321	37,802,727	76.64	68.70	6.06
	Total	39,038,194	55,024,085	100.00	100.00	

Source: UNCTADstat and own calculations

III. Implementation of AGOA and its Rule of Origin

Prior to AGOA, 48 sub-Saharan African countries were granted preferential access to the U.S. market for a range of exports under the Generalized System of Preferences (GSP). These countries were essentially paying a zero tariff (subject to certain conditions) to export to the U.S market and the margin of preference[5] for African exporters was about 5 percent (Mattoo *et al.* (2003). The restrictive implementation of the GSP scheme meant that the overall gains for LDCs were limited (UNCTAD, 2003).

AGOA was signed into law on May 18, 2000 as Title 1 of the Trade and Development Act of 2000 and has been modified several times, the latest of which extends the preferential access for imports from beneficiary Sub-Saharan African countries until September 30, 2015; and extends the third country fabric provision until September 2012[6]. The two main advances of AGOA over the GSP preference scheme are that (i) the existing preferential access given to sub-Saharan African countries under the GSP scheme has been extended in time; and (ii) the range of products for which preferential access is granted has increased (Mattoo *et al.* (2003). Of particular importance here is that AGOA grants preferential access to apparel products, previously subject to quotas under the MFA and tariffs.

Initially, 34 countries were deemed eligible[7] under AGOA's extensive qualification criteria. These criteria demand that the country must have established or are making continual progress toward establishing: a market-based economy; the rule of law; the elimination of barriers to U.S. trade and investment; protection of intellectual property; poverty-alleviation policies; protect internationally recognized worker rights; and a system to combat corruption. Furthermore, a country cannot participate in activities that undermine U.S. national security or foreign policy interests; cannot engage in gross violation of human rights; cannot provide support for acts of international terrorism; and must have implemented commitments to eliminate the worst forms of child labour.

[5] The advantage gained by African exporters over other most favoured nation (MFN) exporters.
[6] http://www.agoa.gov/agoalegislation/index.asp
[7] By December 2004, six more countries were added to the list – Swaziland, Côte d'Ivoire, The Gambia, the Democratic Republic of Congo, Angola, Burkina Faso – and two were removed (Central African Republic and Eritrea). By June 2008; Burundi, Liberia, Togo, and Comoros were added to the list; Côte d'Ivoire was removed; and Mauritania was removed and re-added during this period. In January 2009, Mauritania was once again removed.

Eligibility under the above criteria only grants preferential access for non-apparel exports from an African country. A further criterion needs to be satisfied in order to be granted duty-free access for apparel exports – an effective visa system to verify and enforce the source of the fabric or yarn used in apparel production. On January 18 2002, Kenya and Mauritius were the first countries to be declared eligible for the apparel provision and in subsequent years more countries were admitted to this provision. The apparel provision allows duty-free and quota-free access to the U.S. market for most apparel products, on condition that the yarn or thread comes from either the United States or an AGOA country.

A further Special Rule for Apparel was implemented under AGOA and applied to lesser developed countries (LDCs), enabling them to source their fabric or yarn from anywhere in the world. Countries that fall under the lesser-developed category are defined as having a per capita GNP below $1,500 in 1998 as measured by the World Bank. At the time of this study, Mauritius and South Africa are the only countries that are eligible for the apparel provision but not for the special rule.

IV. After AGOA: Africa's clothing trade with the U.S.

A cursory look at the data

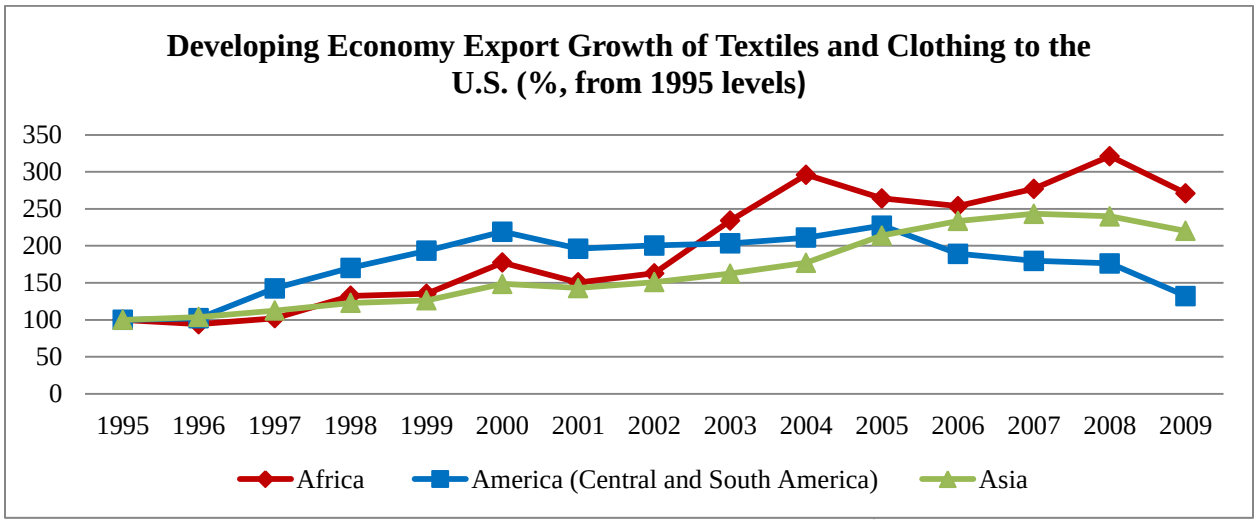

Figure 1: Developing economy export growth of textiles and clothing to the U.S. ***Source: UNCTADstat and own calculations***

Using the 1995 value of each region's developing economies' exports of textiles and clothing to the U.S. as a base, Figure 1 presents the corresponding growth over time. For Africa, there is a clear upward trend from 2001 onwards, with the 2009 value of exports almost double the 1999 value. Central and South America saw positive growth from 2001-2005 but subsequently experienced a decline in apparel export values to lower than their 1999 level. Asian developing economies' apparel exports to the U.S. also display an upward trend from the late 1990s, peaking in 2007, soon after the removal of the MFA quotas.

Table 2 provides more detail on the export shares of these three developing regions. In total (clothing and textiles), Africa's share of exports to the U.S. increased from 1.95% (2000) to 2.43% (2009). Although this is still a very small share of total exports, Africa's annual average growth in apparel exports was almost 9% - the highest of all the regions. Central and South America's significant decline in export market share (the share of exports in 2009 being half the 2000 share) was largely due to the rapid rise of the Asian apparel industry.

Table 2: Developing Economy Exports of Textiles and Clothing to the U.S. (US$ thousands)

					Export share (%)			
		1999	2000	2009	1999	2000 (start of AGOA)	2009	Annual Average Growth 2000-2009
Textile fibres	Africa	21,239	33,954	23,846	4.69	8.14	4.16	16.30
	America (Central and South America)	198,064	160,901	72,564	43.74	38.55	12.65	-7.70
	Asia	233,501	222,504	477,150	51.57	53.31	83.19	8.85
	Total	452,804	417,358	573,560	100	100	100	
Textile yarn and related products	Africa	125,976	131,342	127,500	1.47	1.36	0.92	4.70
	America (Central and South America)	2,324,780	2,479,185	1,792,998	27.17	25.66	12.91	-2.07
	Asia	6,106,538	7,049,373	11,964,411	71.36	72.98	86.17	7.50
	Total	8,557,294	9,659,899	13,884,910	100	100	100	
Clothing and accessories	Africa	808,097	1,086,990	1,763,031	1.76	2.01	2.73	10.10
	America (Central and South America)	13,743,201	15,801,020	9,246,835	29.87	29.21	14.34	-3.12
	Asia	31,462,689	37,198,381	53,453,524	68.38	68.78	82.92	5.77
	Total	46,013,987	54,086,391	64,463,390	100	100	100	
Total Clothing and Textiles	Africa	955,312	1,252,285	1,914,377	1.74	1.95	2.43	8.92
	America (Central and South America)	16,266,045	18,441,105	11,112,397	29.56	28.74	14.08	-3.08
	Asia	37,802,727	44,470,258	65,895,086	68.70	69.31	83.49	6.06
	Total	55,024,085	64,163,649	78,921,859	100	100	100	

Source: UNCTADstat and own calculations

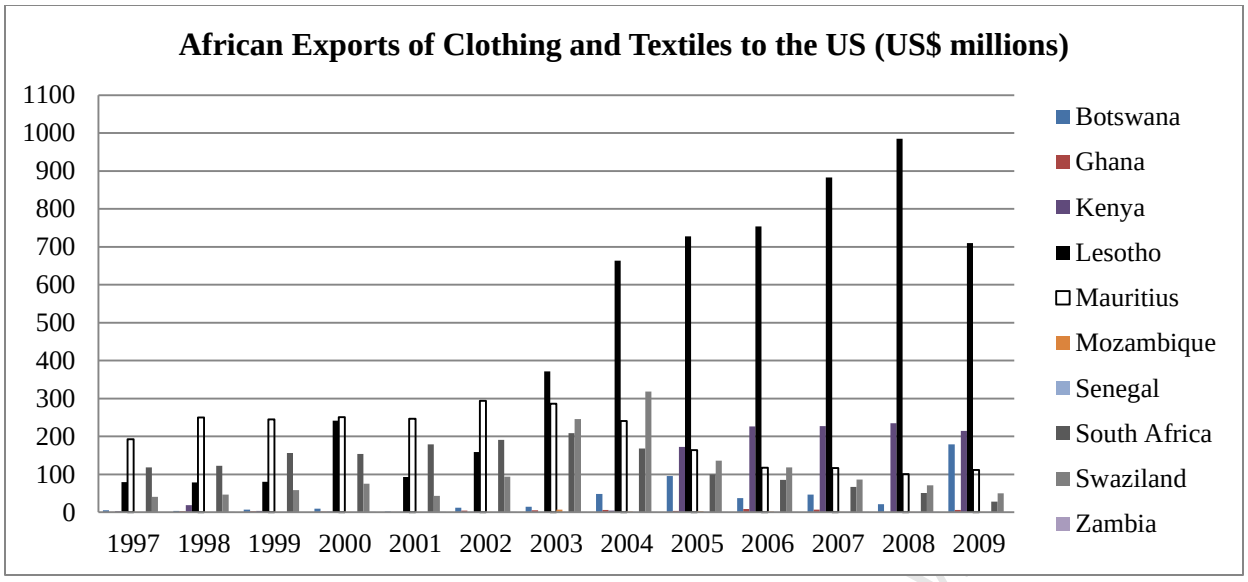

Figure 2: African exports of clothing and textiles to the U.S. ***Source: UNCTADstat and own calculations***

Figure 2 further supports the claim that African countries experienced a significant rise in apparel exports to the U.S from the year 2000 – arguably in response to the AGOA. The individual country trends of AGOA-eligible countries, in Figure 2, also seem to promote the idea that more restrictive ROOs hinder the effectiveness of trade preferences. In the given sample of countries, the three leading exporters of clothing and textiles to the U.S., prior 2001, were Mauritius, Lesotho, and South Africa. Over time, Mauritius and South Africa – who are not eligible for the special apparel provision – have steadily moved down the list in terms of the value of apparel exports to the U.S. Since the start of AGOA, Lesotho has seen significant improvement in apparel exports and is now Africa's leading apparel exporter by some margin. Kenya and Botswana have also experienced a considerable export supply response.

Overall, the data tells us that there has been a clear upward trend in the value of African apparel exports to the U.S. In order to understand the role of AGOA in this context, rigorous analysis is necessary. Before presenting the contribution of this paper to the literature and the estimation technique used, a review of the existing literature is conducted.

Africa's apparel export response to AGOA: A review of the literature

Gibbon (2003) examines the initial response to AGOA (in 2002) in sub-Saharan Africa's clothing sector from a global commodity/global value chain perspective. Gibbon (2003) traces exports from SSA's dominant clothing exporters[8] to the U.S. and the European Union over the period 1990-2002, using importing country data[9] and suggests that there has been a clear supply response to AGOA. The data illustrates that total U.S. imports from SSA's five dominant clothing exporters rose by 85.3 percent during 1999-2002, while total exports to the EU fell by 5.5 percent. Gibbon's (2003) remaining principle findings are that a re-direction of existing trade from the EU to the U.S. has been limited and that the African clothing imports of the U.S. have become more dispersed than those of the E.U. during this process.

Furthermore, by comparing the volume shares of AGOA-qualifying imports by the U.S from the five countries in question to the corresponding duty-paid imports; Gibbon (2003) finds that the leading least developed beneficiary countries (Kenya, Lesotho, and Madagascar), were exporting "on an overwhelmingly AGOA-compliant basis" in 2002. However, Mauritius and South Africa, subject to more restrictive rules of origin, were still exporting on a mainly non-complying basis. For these two countries, the considerable increase in proportion of exports that were AGOA-compliant from 2001 to 2002 occurred in the absence of a significant increase in total export levels – thus suggesting that the improved compliance was probably achieved through greater compliance by existing exporters, rather than the emergence of new ones.

Morris (2006) extends Gibbon's (2003) data analysis to 2004. He shows that the proportion of AGOA-qualifying clothing exports from South Africa and Mauritius as a percentage of total clothing exports rose considerably to 81 percent and 65 percent, respectively, in 2004 (from 17.4 and 16.3 percent in 2001, respectively). Morris (2006) adds that, in both cases, this proportional increase is a direct result of the decline in total clothing exports to the U.S, largely due to a collapse of their non-AGOA clothing exports. South Africa even failed to maintain an upward

[8] Kenya, Lesotho, Madagascar, Mauritius, and South Africa account for around 90 percent of African clothing exports in 2001 (Gibbon, 2003).
[9] From the following sources: US International Trade Commission (www.usitc.org); US Department of Commerce, Otexa (www.otexa.gov); and Eurostat Comtrade data base.

trend in its AGOA-qualifying exports. Evidently, both countries were severely affected by the end of the MFA and the rise of China in the global market (Morris, 2006).

Mattoo *et al.* (2003) predict the effects of AGOA on supply responses. They estimate that AGOA would raise Africa's non-oil exports by 8 – 11 percent[10], with most of this increase driven by the apparel sector, which is expected to experience higher exports of about 8.3 percent. Using the triple difference-in-difference method, Frazer and van Biesebroeck (2010) conclude that the U.S. import responses (of apparel) to AGOA are considerably larger at 42 percent on average. Furthermore, they suggest that the effect has been increasing over time, even after the end of the MFA in 2005 where after African countries faced increased competition in the U.S. market from China and other Asian countries. Countries that were already significant exporters to the U.S. market were reported to have taken better advantage of the Act.

Rolfe and Woodward (2005) also focus on the impact of AGOA on the apparel industry and support the idea that selected African countries have experienced a positive export supply response. They suggest that geographic location is an important factor, with southern and eastern African countries (including the islands of Mauritius and Madagascar) benefitting the most from the preferential access – only two west African countries, Ghana and Sierra Leone, reached over one million U.S. dollars in apparel exports by the end of 2004. Although West Africa is closer to the U.S., it is the eastern and southern countries that benefit from proximity and historical ties to Asia; an important advantage when relying on Asian fabric, capital, and know-how.

Rules of origin as an import barrier

ROO are required in any preferential trading arrangement (PTA) for two main purposes. These are given by Flatters and Kirk (2003) as firstly, to *authenticate* that the goods receiving the tariff benefit originate from the PTA region as to prevent an abuse of the scheme through 'tariff jumping' activities. The second purpose being the *protective* effect; where the ROO encourages certain regional activities such as the production of intermediate goods, or protects these

[10] This represents how much exports would be higher than what they would otherwise be – in other words, taking into account the export growth trend without AGOA, this estimate represents how much AGOA raises the trend path of exports (Mattoo *et al.*, 2003).

activities from potential competition, as a result of the PTA, by requiring a large proportion of input goods to be sourced from within the PTA.

Despite the implementation of AGOA, it is reported by Naumann (2009) that only half of the beneficiary countries had been able to achieve exports worth US$1 million each in 2008, which shows that these countries are experiencing major challenges in extracting the full benefit from this scheme. He lists some of these challenges as high transportation costs, poor infrastructure, distance to market, generally challenging business environment and supply side constraints (in part due to ROOs).

Clothing is the second largest export sector that utilizes AGOA benefits. Africa's exports under AGOA – which provides favourable ROOs – are presented in Figure 3. It is shown that in 2001, almost 75 percent of AGOA-eligible exports made use of third country fabric concessions, with this figure increasing to 87 percent in 2007. The clothing exports under AGOA increased by over 250 percent over this period; whereas the value of non-AGOA compliant exports declined. This reflects the fact that African clothing exporters are largely unable to compete on the international market without being able to access low-cost fabric supply networks.

$ '000	2001	2002	2003	2004	2005	2006	2007
Total clothing exports	954 107	1 108 455	1 504 499	1 751 787	1 460 738	1 288 409	1 291 338
Clothing exports under AGOA	355 332	798 152	1 197 081	1 613 554	1 418 388	1 255 641	1 266 198
Clothing exports using third country fabrics	264 433	596 049	914 309	1 325 519	1 235 140	1 094 919	1 104 365

Figure 3: African clothing exports. ***Source: Naumann (2009).***

Mattoo *et al.* (2003) also support the notion that it is the LDCs that have benefitted the most from AGOA's apparel provisions since South African and Mauritius have posted significantly more modest growth. They highlight the restrictive impact of the rules of origin through reporting the a very small portion – 9 to 14 percent – of total exports from South Africa and

Mauritius have benefitted from the tariff preferences, which is in contrast to LDCs that enjoy a corresponding share of closer to 50 percent. Furthermore, Mattoo *et al.* (2003) estimated the increase in exports due to AGOA had there been no ROO requirement on Mauritius, during the period 2001-2004, which turned out to be 36 percent – substantially higher than the actual 5% increase over this period.

The quality composition of clothing exports

Although much research has been focused on the impact of AGOA's apparel provision on Sub-Saharan Africa's apparel exports, most of this research examines the response in either volume or value terms. A focus on the composition of AGOA-eligible exports has largely been neglected and is the third focus of this paper.

Rolfe and Woodward (2005) analyse the composition of the apparel exports by examining data on the top five types of garments exported by SSA's leading garment exporters to the U.S. The unit prices (per dozen) of the exports from Lesotho, Kenya, Madagascar, and Swaziland are consistently less than, or approximately equal to, the corresponding unit price from China and India. Mauritius is the only exception. The lower unit prices do not, however, reflect lower production costs since these countries are reliant upon imported Asian cloth and experience high energy costs, high transportation costs, poor infrastructure, and other costs (Naumann (2009), Yeats, Amjdi, Reincke, and Ng. (1996); rather it reflects the quality of the exported garment Rolfe and Woodward (2005). Their analysis of the trade data suggests that the types of garments produced in those four countries are lower-end basic commodity garments that involve simpler design, with less embroidery and minimal ornamentation.

In order to determine the local economic benefits stemming from AGOA, an examination of local value added provides a better understanding of the extent to which the increased exports generate real economic gains for African economies. In this context, gross export values are deceptive since a large part of the foreign exchange earned by the exports us used to pay for imported inputs. An in depth look at the Kenyan apparel industry revealed that the value of local Kenyan components in apparel exports comprises a mere three percent of the sales value (Rolfe and Woodward (2005). Therefore, Rolfe and Woodward (2005) conclude that the real benefits of AGOA in apparel may be smaller than commonly believed.

Contribution of the paper to existing literature

This paper aims to investigate the impact of AGOA's apparel provision on African firms. The focus is not only on the export supply response but also on the apparel provision's impact on the quality composition of export. There is much evidence to suggest that AGOA has had a largely positive affect on the export performance of African apparel firms but the evidence on the composition of these exports is insufficient.

Rolfe and Woodward (2005) suggest that in four selected AGOA-beneficiary countries, the types of garments produced are lower-end basic commodity garments. Focusing specifically on Kenya, they have found that the value added component of Kenyan apparel exports makes up a mere 3 percent of the sales value. Edwards and Lawrence (2010) perform an in depth study on the impact of AGOA's apparel provision on Lesotho's apparel exports and find that the special apparel provision "distorts decisions on value-addition and fabric use in opposite directions, both of which is undesirable". They suggest that AGOA provides more powerful incentives in lower quality products, which limits the potential dynamic benefits of a trade preference scheme, through discouraging skills development and other forms of quality upgrading. However, a direct focus on the impact of the apparel provision on the composition of African exports has been largely neglected. This paper tries to shed more light on this issue.

A considerable improvement on prior literature is that this paper makes use of firm-level data as opposed to country-level data. Much of the existing literature on trade flows, particular in Africa, have focused on aggregate or industry-level data – which is merely the sum of exports at the firm level (Edwards, Rankin, & Schoer, 2008). These types of studies do not account for heterogeneity in firms and the idea that firms make the decisions as whether to participate in export activities and to what extent.

The firm-level approach of this study is relevant given the evidence that firms that trade differ substantially from firms that do not and these differences have important consequences for evaluating gains from trade (Bernard, Jensen, Redding, and Schott, 2007). By estimating the impact of AGOA on firm behaviour, it allows a deeper understanding of the dynamic benefits resulting from the agreement. Firm-level data can control for the different types of firms in terms of which industry they belong to, size, or whether they are existing firms or new entrants;

allowing for more robust result. Essentially, firms are at the core of driving export growth and ultimately economic growth and thus this firm-level study would deepen our understanding of the effect of trade policy and import barriers on exports.

V. A Firm-Level Model

This section aims to develop the firm-level theoretical model that underpins this study. It explores the impact of a rule of origin requirement on the relative price of a high fabric content good relative to a low fabric content good and what impact this has for the firm's supply and the consumer's demand for each good. Focusing firstly on the supply-side, the model investigates the affect of the rule of origin requirement on the relative price of a high fabric content garment relative to a low fabric content garment. Moving the demand side of the model, it is shown that there is a different impact on demand when a tariff is applied uniformly across apparel products as opposed to the rule of origin requirement. The model assumes a perfectly competitive market where price (*P*) is equal to marginal cost (*MC*).

Supply Side

Consider a two product model:

1. High fabric content garment: a_v^{High}
2. Low fabric content garment: a_v^{Low}

Where a_v represents the ratio of fabric per unit of output. Naturally, since a high fabric-intensive garment consists of a greater portion of fabric per unit of output than a low fabric content garment, $a_v^{High} > a_v^{Low}$.

Following Portugal-Parez (2008), we specify is a Leontief technology production function whereby African apparel (Y) is assembled by combining value added with intermediate goods as follows:

$$Y = \min\{f(K, L); \frac{V}{a_v}\}$$

Two types of fabric are used in production. The fabrics are differentiated by source and are perfect substitutes:

1. V^{AGOA} represents fabric originating from the exporting country, from another AGOA-eligible country, or from the U.S. at price FP^{AGOA}.
2. V^* represents fabric originating from anywhere else in the world at price FP^*.

Therefore, $V = V^{AGOA} + V^*$ gives us the total quantity of intermediate fabric used in production of apparel.

The USA price of each product depends on the price of labour (wage), the price of fabric, and the tariff rate:

$$P_g^{USA} = [w_g + a_v^g FP](1 + t)$$

Where, $g = \{High, Low\}$; *and* t *represents the tariff rate*.

For simplicity, we assume that the production of each unit of clothing requires one unit of labour ($w_g = 1$) and thus labour costs are uniform across the product types. Therefore,

$$P_H^{USA} = \left[1 + a_v^{High} FP\right](1 + t)$$

$$P_L^{USA} = [1 + a_v^{Low} FP](1 + t)$$

Where, $P_H^{USA} > P_L^{USA}$ and the tariff rate is common across all products.

The total cost of fabric used in production can be represented by:

$$FP = rFP^{AGOA} + (1 - r)FP^*$$

Where r represents the rule of origin requirement. The more stringent the requirement, the greater the proportion of fabric originating domestically, from another AGOA-eligible country, or from the U.S. must be used in apparel production, in order to export through the preference agreement.

By substituting in the fabric price equation, we obtain:

$$P_g^{USA} = \left[1 + a_v^g (rFP^{AGOA} + (1 - r)FP^*)\right](1 + t)$$

To obtain the marginal impact of the ROO requirement on the price of the good, comparative statics are performed:

$$1. \qquad \frac{\partial P_g^{USA}}{\partial r} = a_v^g [FP^{AGOA} - FP^*](1+t)$$

Therefore when $FP^{AGOA} > FP^*$, the price of an apparel product increases the more stringent the rule of requirement. In other words, as the local fabric content requirement increases – as opposed to sourcing cheaper Asian fabric – the price of a good rises.

Furthermore,

$$\frac{\partial P_H^{USA}}{\partial r} > \frac{\partial P_L^{USA}}{\partial r}$$

When $FP^{AGOA} > FP^*$ as $a_v^{High} > a_v^{Low}$.

Given that fabric is sourced at cheaper prices from China and other Asian countries as compared to from within AGOA beneficiary countries or the U.S., $FP^{AGOA} > FP^*$ is assumed to hold. As the rule of origin becomes less stringent, as in the case of AGOA LDC beneficiary countries, the price of a garment falls. Furthermore, a change in the rule of origin requirement has a relatively larger affect on the price of a high fabric intensive garment compared to the price of a low-fabric intensive garment. In other words, the marginal impact of the ROO requirement on the price of a good is greater for the higher fabric intensive varieties.

Demand side

In order to identify the impact that the ROO will have on sales, we need to look at the demand side of the model. For any variation in prices, the Hicksian compensated demand function gives precisely the level of demand that would arise if the consumer's wealth were simultaneously adjusted to keep her utility level constant – in this case at level U^0. As we are now looking at price changes, we want to avoid including income effects that may result in ambiguous results. Therefore, we use a simple Hicksian compensated demand function in order to isolate the substitution effect (the change in demand for high- relative to low-fabric intensive apparel

goods) for a change in the price of either type of garment. The demand function for an importer from the U.S. is given as follows[11]:

$$q_g = h(P_H^{USA}, P_L^{USA}, U^0)$$

Demand depends on the price of the high fabric intensive goods, low fabric intensive goods, and the consumer's preferences. This function provides the quantities of high fabric-intensive and low fabric-intensive goods that minimize the expenditure required to achieve utility level U^0 at the current prices P_H^{USA} and P_L^{USA}.

The model assumes a Cobb-Douglas utility function in the form[12]:

$$U(q_H, q_L) = q_H^{\propto} q_{jL}^{(1-\propto)}$$

Where α represents the share of expenditure on high fabric intensive apparel goods and (1-α) representing the remaining share of expenditure used to purchase low fabric intensive goods.

The compensated demand functions can be obtained by solving the problem:

$$\min[P_H q_H + P_L q_L] \qquad subject\ to\ \ U(q_H, q_L) = U^0$$

This provides the following demand functions:

$$h_H(P, U) = q_H = \left[\frac{\propto P_L}{(1-\propto)P_H}\right]^{1-\propto} . U$$

and $$h_L(P, U) = q_L = \left[\frac{(1-\propto)P_H}{\propto P_L}\right]^{\propto} . U$$

Therefore relative demand can be expressed as:

$$\frac{q_H}{q_L} = \frac{\propto P_L}{(1-\propto)P_H} = \frac{\propto [(1 + a_v^L(rFP^{AGOA} + (1-r)FP^*)(1+t)]}{(1-\propto)[(1 + a_v^H(rFP^{AGOA} + (1-r)FP^*)(1+t)]}$$

[11] Note: $g = \{H, L\}$

[12] Note: It is assumed that clothing consumption is separate from the consumption of other goods.

Examining the effect of both the ROO requirement and the tariff on the relative demand of high fabric intensity garments to low fabric intensity garments, comparative statics are performed and the results are as follows:

$$\frac{\partial(\frac{q_H}{q_L})}{\partial FP} < 0$$

And

$$\frac{\partial FP}{\partial r} = [FP^{AGOA} - FP^{*}] \qquad > 0$$

Since,

$$\frac{\partial(\frac{q_H}{q_L})}{\partial r} = \frac{\partial(\frac{q_H}{q_L})}{\partial FP} * \frac{\partial FP}{\partial r}$$

Thus,

$$\frac{\partial(\frac{q_H}{q_L})}{\partial r} < 0$$

The implication that this result has for this study is that as the rule of origin requirement becomes less stringent – as in the special apparel provision of AGOA – the demand for high fabric intensive goods rises relatively more than the demand for low fabric-intensive goods. In other words, there is a relatively greater affect on the demand for high fabric intensive goods – consumers shift away from low fabric content garments toward more high fabric content garments.

Contrasting this to the impact of a tariff reveals the following:

$$\frac{\partial(\frac{q_H}{q_L})}{\partial t} = 0$$

Using a tariff as a trade barrier has no effect on the relative demand of goods. Although AGOA has eliminated tariff barriers, they do impose certain rules of origin requirements. As it was

shown in this model, it is the ROOs that drive the composition affects, which highlights the importance of investigating the impact of AGOA on the composition of the increased African sales and provides a motivation for this study.

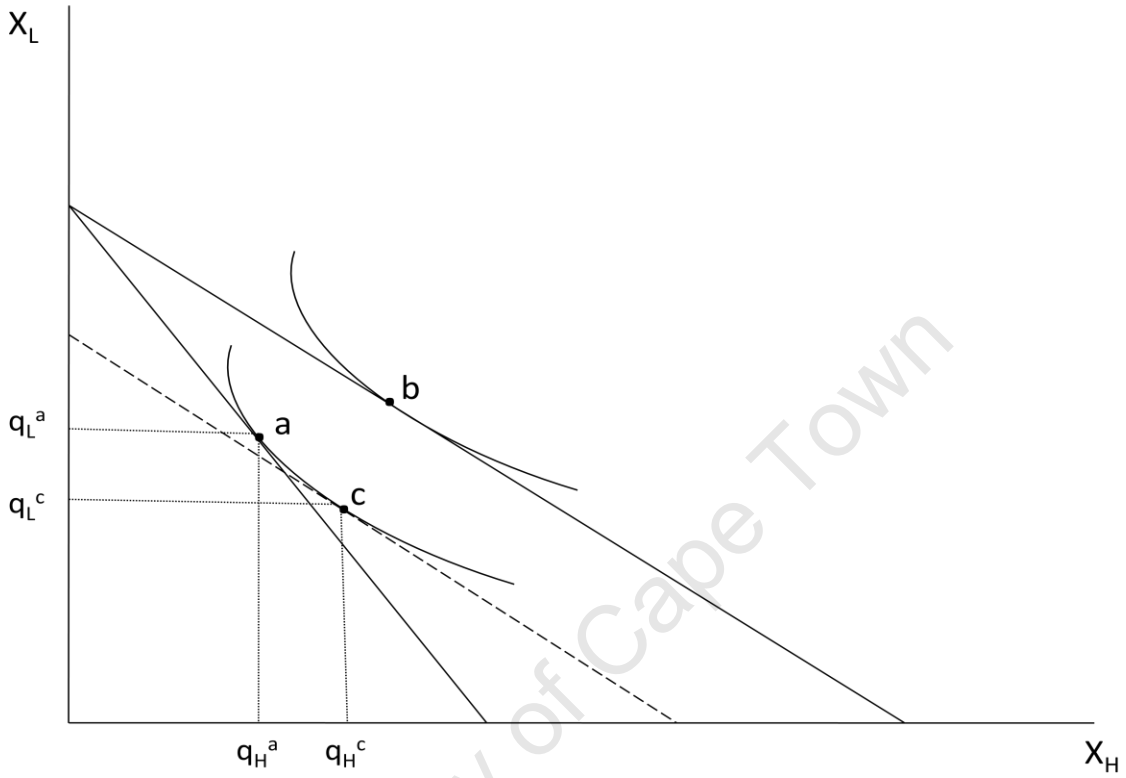

Figure 4: Illustrating the substitution effect of a decrease in the price of high fabric-content garment varieties.

A graphical representation of the effect of the ROO requirement on the relative demand of high fabric intensive goods to low fabric intensive goods is given by Figure 4. Assuming the initial equilibrium point is at *a*; as the price of a high fabric-intensive garment becomes relative cheaper, the consumer's budget constraint pivots outward, to reach a new consumption bundle at point *b*. In order to isolate the substitution effect of this price change, one has to locate the point on the original indifference curve, tangent to the new budget constraint. This, therefore, results in the new equilibrium point *c*. At *c*, the consumer experiences the same level of utility as at point *a*, except the composition of the bundle of goods has adjusted to reflected the change in relative price.

This adjustment is represented by a (q_L^a - q_L^c) unit decrease in consumption of low fabric-intensive apparel, replaced by a (q_H^c – q_H^a) unit increase in consumption of high fabric-intensive apparel goods.

VI. Empirical Specification and Results

This paper uses data from the World Bank Enterprise Survey database. The focus is on the apparel sector firm-level data from twelve African countries and the same data from firms in eight South American and eight Asian countries are used for comparative analysis.

Export participation and intensity

The data sample is comprised of 1458 clothing firms in South America, 2627 in Asia, and 648 in Africa; which suggests that although we consider more countries within the African continent, each African country has considerably fewer clothing firms than each Asian or South American country.

Table 3 indicates a remarkable difference in the percentage of clothing firms involved in exporting between Africa and Asia. Approximately 38 percent of clothing firms in Africa export, which is closer to South America at 35 percent, compared to the 53 percent in Asia. Africa displays a wide variation in this regard, ranging from 7.7 percent of in Mozambique, to 86 percent of clothing firms being exporters in Lesotho. Tanzania, South Africa, and Senegal are the only other African countries to have less than a quarter of their clothing firms participating in export activities. The variation in South American and Asian firms is less pronounced and the percentage of clothing firms participating in export activities is at least equal to or exceeds 25 percent for all Asian countries, and for seven of the eight South American countries.

Examining the proportion of sales exported within the clothing exporters, the data indicates that on average, African and South American exporters supply to both domestic and foreign markets. South America clothing firms export a lower average percentage of sales than African firms, 39 percent compared with 54 percent. Firms in three of the twelve African countries – Lesotho, Swaziland, and Mozambique – export, on average, more than 80 percent of their sales. Asian clothing firms are far more export oriented, with an average percentage of sales exported at 82 percent for the region. Individually, firms in Bangladesh and Sri Lanka export in excess of 90 percent of sales; and those in India, Indonesia, and Vietnam export between 75 percent and 85 percent of sales.

Table 3: General Statistics. [T = Textiles; G = Garments; C = Total clothing (Textiles + Garments)]

	Number of firms			Number of firms that export			% of firms that export			Mean sales exported (% of sales)		
Country	**T**	**G**	**C**	**T**	**G**	**C**	**T**	**G**	**C**	**T**	**G**	**C**
Argentina	117	119	236	55	39	94	47.01	32.77	39.83	18.76	8.56	14.53
Bolivia	0	121	121	-	55	55		45.45	45.45	-	57.56	57.56
Chile	49	72	121	18	12	30	36.73	16.67	24.79	21.33	8.75	16.30
Columbia	147	172	319	56	77	133	38.10	44.77	41.69	29.96	41.40	36.59
Ecuador	44	27	71	17	9	26	38.64	33.33	36.62	20.88	30.67	24.27
Mexico	155	162	317	14	7	21	9.03	4.32	6.62	23.43	32.14	26.33
Peru	35	120	155	23	68	91	65.71	56.67	58.71	50.70	56.37	54.93
Uruguay	44	74	118	28	30	58	63.64	40.54	49.15	66.61	63.57	65.03
South America	**591**	**867**	**1458**	**211**	**297**	**508**	**35.70**	**34.26**	**34.84**	**32.27**	**43.89**	**39.06**
Bangladesh	262	306	568	60	258	318	22.90	84.31	55.99	82.05	99.52	96.22
China	0	353	353	-	127	127	-	35.98	35.98	-	73.31	73.31
India	225	274	499	79	160	239	35.11	58.39	47.90	65.59	84.96	78.55
Indonesia	188	155	343	87	66	153	46.28	42.58	44.61	62.78	90.23	74.62
Malaysia	30	102	132	12	33	45	40.00	32.35	34.09	61.00	46.75	49.60
Sri Lanka	82	139	221	28	131	159	34.15	94.24	71.95	69.00	96.73	91.84
Thailand	186	168	354	87	128	215	46.77	76.19	60.73	49.60	79.49	67.40
Vietnam	79	78	157	64	72	136	81.01	92.31	86.62	77.00	88.39	83.03
Asia	**1052**	**1575**	**2627**	**417**	**975**	**1392**	**39.64**	**61.90**	**52.99**	**66.00**	**89.34**	**82.09**
Botswana	2	25	27	1	6	7	50.00	24.00	25.93	95.00	68.43	72.23
Kenya	22	89	111	13	42	55	59.09	47.19	49.55	25.27	46.11	41.19
Lesotho	29	0	29	25	-	25	86.21	-	86.21	88.20	-	88.20
Mauritius	60	0	60	50	-	50	83.33	-	83.33	75.52	-	75.52
Swaziland	5	15	20	4	12	16	80.00	80.00	80.00	90.00	82.50	84.38
Tanzania	3	51	54	1	4	5	33.33	7.84	9.26	25.00	21.25	22.00
Zambia	23	0	23	16	-	16	69.57	-	69.57	44.25	-	44.25
Ghana	1	115	116	1	34	35	100.00	29.57	30.17	2.00	24.85	24.20
South Africa	9	105	114	3	23	26	33.33	21.90	22.81	56.67	32.35	35.15
Mozambique	0	52	52	-	4	4		7.69	7.69	-	87.50	87.50
Senegal	1	42	43	0	6	6	0.00	14.29	13.95	0.00	27.33	27.33
Africa	**155**	**494**	**649**	**114**	**131**	**245**	**73.55**	**26.52**	**37.75**	**67.28**	**42.18**	**53.86**

Import intensity

Given the literature explored in Section II regarding the relatively poor apparel export performance of South Africa and Mauritius to other AGOA beneficiary countries, it can be seen to imply that access to cheap imports are important. The rise of selected LDC beneficiary countries through the special apparel provision also suggests that African clothing exporters are largely unable to compete on the international market without being able to access low-cost fabric supply networks. In this section we test the hypothesis of whether African firms, and more specifically African exporters, are relatively more dependent on imported inputs than other developing countries.

Through recording the proportion of total material inputs and supplies that are of foreign origin for each firm, the survey data allows for the investigation of import intensity. Table 4 indicates that on average, African clothing firms – with 58 percent of their material inputs and supplies being of foreign origin – are more dependent on imports than South America and Asian exports, who import approximately 37 percent and 52 percent of their inputs to production, respectively. African exporters are more than two times more dependent on imports than non-exporters. Asian firms also show a similar disparity between exporters and importers, which is not seen in the South American region. The overall emphasis here is than African clothing exporters are highly dependent on imported inputs, more so than African non-exporters and Asian and South America exporters.

Exporting firms from Botswana show a significantly higher dependence on imports, at 95 percent, relative to all the sample countries. Furthermore, Botswana also has the fifth highest exports as a percentage of sales of all the African countries (Table 3 indicates this to be at 72 percent). Exporting firms in Lesotho have the second highest import intensity figure of all sample countries, at an average of 83 percent. Lesotho clothing firms are the export leaders in Africa. On the other hand, the least import intensive firms are in South African and Tanzania (an average of 34 and 42 percent of inputs are of foreign origin, respectively), which are also the two African countries that are the least export intensive. Taken together, this does suggest an association between higher import intensity and higher export intensity.

The relationship between import intensity and export intensity is also closely examined in Table 4. For each region as a whole, the evidence shows that firms that export relatively less (up to 25 percentage of sales) are considerably less dependent on imported inputs than firms that export a greater percentage of sales (76 – 100 percent). This remains true for firms in all African countries, except Zambia and South Africa; those in all Asian countries, except India; and for firms in only three of the eight South American countries.

Overall, exporters are, in some cases remarkably and in others marginally, more dependent on imported inputs to production than non-exporters and this is evident in all but four of the sample countries – Bolivia, Ecuador, Peru, and Uruguay. More importantly, the data supports our initial expectation in that African clothing exporters are highly dependent on imported inputs, more so than African non-exporters and Asian and South America exporters.

Table 4: Import intensity

Clothing firms: Mean foreign inputs (% of total inputs)								
	Export intensity				Total exporter		Total Non-exporter	
Country	<= 25%	26-50%	51-75%	76-100%				
	Mean				Mean	Freq	Mean	Freq
Argentina	33.48	33.13	40.00	65.00	34.87	93	30.36	139
Bolivia	65.00	51.54	61.29	58.75	58.96	54	69.17	65
Chile	52.87	42.00	70.00	40.00	51.20	30	50.02	90
Columbia	16.22	25.50	20.86	25.71	20.74	133	16.89	186
Ecuador	51.36	43.00	0.00	5.00	43.61	18	47.33	30
Mexico	19.62	21.67	50.00	100.00	25.48	21	5.52	296
Peru	34.52	36.11	26.67	24.39	30.09	91	33.45	64
Uruguay	74.80	77.22	37.14	60.55	62.89	55	33.45	54
South America	**34.94**	**37.07**	**31.24**	**44.08**	**36.85**	**495**	**27.42**	**924**
Bangladesh	25.00	59.29	69.00	67.69	67.01	318	41.97	238
India	5.46	6.90	6.97	4.08	4.76	228	3.28	212
Sri Lanka	69.38	35.71	50.00	78.49	75.96	158	27.98	62
Vietnam	52.22	52.27	57.33	77.67	71.51	132	38.89	18
Asia	**24.52**	**27.43**	**44.31**	**56.89**	**52.43**	**836**	**24.75**	**530**
Botswana	100.00	80.00	95.00	97.50	95.00	7	53.50	20
Lesotho	18.33	.	100.00	91.50	82.71	24	0.00	1
Mauritius	65.00	80.00	55.00	57.19	60.85	47	53.57	7
Swaziland	0.00	90.00	100.00	85.31	81.19	4	0.00	16
Tanzania	47.50	20.00	.	.	42.00	5	31.94	49
Zambia	69.00	0.00	15.50	15.00	44.50	16	27.14	7
Ghana	52.00	43.54	80.00	0.00	48.17	35	19.48	81
South Africa	40.50	26.67	50.00	35.00	34.42	26	11.48	88
Mozambique	.	.	20.00	66.67	55.00	4	14.90	48
Senegal	46.25	25.00	.	70.00	46.67	6	23.92	37
Africa	**52.63**	**42.89**	**57.82**	**68.92**	**58.13**	**186**	**23.30**	**361**

For more rigorous analysis, we use an econometric model to test our expectation. The econometric estimation model used to estimate the determinants of export participation is that of a probit model and follows the approach taken by Dollar, Hallward-Driemeier, and Mengistae (2006). Indicators used to explain the probability of a firm participating in export activities include age and size of the firm, means of communication, skills of available workers and import intensity; with the data sample restricted to clothing firms. Import intensity – the percentage of total inputs to production that are of foreign origin – is the focus of attention here. A full description of the variables is included in Appendix A (Table 5).

Prior literature on firm-level predictors of export participation has resulted in some stylized facts. It is widely reported that exporting firms are significantly larger than non-exporters (measured by the number of employees) (Bernard et al., (2007); Rankin, Soderbom, and Teal (2006)). In determining the importance of the size of the firm on export performance in Sub-Saharan Africa, Rankin et al. (2006) also control for labour productivity, sector composition of exports, and capital intensity; and still maintain that size is a significant factor – more important than any self-selection into exporting based on efficiency. Furthermore, Rankin et al. (2006) suggest that foreign ownership, age, and skills are significant determinants of exporting.

The use of geographical variables is also important since geography is expected to influence export performance in a number of ways, particularly through external geography in terms of a country's proximity to export markets. Redding and Venables (2004) aim to understand the determinants of cross-country variation in the levels and growth of exports and determines that geography creates substantial cross-country variation in the ease of access to foreign markets, which is an important determinant of countries' export performance. Furthermore, they ascertain that export performance also depends on internal geography, which was measured as the proportion of the population close to the coast. This paper makes use of three geographical variables: distance to the United States (the foreign market in focus), the area size of the country, and whether or not it is landlocked (dummy variable).

Table 6 presents the probit model consisting of firm-specific characteristics, geographical variables, and regional dummies (for Africa – represented as AGOA – and South America, making Asia the omitted category), with the marginal effects presented. In the first specification,

the firm-specific variables that are significant in determining export participation are the size of the firm, foreign ownership, and e-mail as a means of communication; as well as the distance to the U.S., and whether or not it is landlocked. These are consistent with previous literature. Furthermore, import intensity is highly significant which indicates that firms that use a larger proportion of imported inputs to total inputs are more likely to export. Both regional dummy variables are significant and indicate that South American firms are least likely to participate in export activities relative to Asian firms; which have the largest probability of export participation.

Specification 2 incorporates an interaction term between the AGOA dummy variable and the import intensity variable, as well as country dummy variables[13] in the place of regional ones. These results support the results of regression 1. The marginal effect of an increase of imported inputs for firms in AGOA eligible countries (the coefficient of the interaction term) is large and significant – suggesting that African firms are relatively more dependent on imported intermediate goods in order to export. This once again confirms are earlier analysis and emphasizes the importance of imported inputs to production for African apparel firms.

[13] The omitted country dummies are: China, Indonesia, Malaysia, Thailand, Kenya, Lesotho, and Swaziland.

Table 6: Export participation (Probit Regression reporting marginal effects)				
Sample	Only clothing firms			
	1		**2**	
Import Intensity	0.138	***	0.125	***
AGOA (dummy)	-0.099	***		
South America (dummy)	-0.107	***		
AGOA dummy*Import intensity			0.253	***
Firm specific characteristics				
Age (log)	0.005		-0.013	
Size (log)	0.077	***	0.129	***
Skill intensity	$1.55x10^{-5}$		-0.000057	**
Foreign ownership (dummy)	0.215	***	0.184	***
E-mail (dummy)	0.302	***	0.278	***
Geographical variables				
Distance to U.S.	$8.11x10^{-6}$	*		
Area (log)	-0.015	*		
Landlocked (dummy)	0.109	***		
Country Dummies				
Ghana			-0.41	***
Botswana			-0.439	***
Swaziland			-0.396	***
Tanzania			-0.446	***
South Africa			-0.463	***
Mozambique			-0.446	***
Senegal			-0.432	***
Mauritius			-0.351	**
Zambia			-0.41	***
Argentina			-0.469	***
Bolivia			-0.423	***
Columbia			-0.467	***
Mexico			-0.547	***
Peru			-0.377	***
Uruguay			-0.412	***
Chile			-0.464	***
Ecuador			-0.438	***
Bangladesh			-0.562	***
India			-0.434	***
Sri Lanka			-0.4	***
Vietnam			-0.34	**
Number of obs	3239		3220	
Wald Chi2(11), Chi2(28)	1603.54		1678.22	
Prob > Chi2	0.000		0.000	
Pseudo R-squared	0.2051		0.2824	
***** significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.**				

Although these results do suggest that African clothing exporters are relatively more reliant on imported inputs in order to export, it does not emphasize the relative importance of imports for clothing firms as compared to other manufacturing firms. Further analysis is now conducted in order to answer the question of whether clothing exporters within AGOA beneficiary countries are more import intensive relative to other firms within these same countries. Therefore, using the total sample of manufacturing firms, Table 7 presents a probit model, reporting marginal effects[14].

The results suggest that import intensity is a significant determinant of export participation. However, to assess the direct impact of import intensity on the probability of export participation amongst clothing firms, the model includes two interaction terms. Firstly, the interaction between the clothing dummy and import intensity to measure the marginal effect of a higher import intensity on the probability of participating in export activities for clothing firms relative to non-clothing firms. There is no significant result to be reported here.

Secondly, the coefficient on the triple interaction term – representing the marginal effect of a 1 percentage point increase in import intensity on the probability of export participation for AGOA-country clothing firms relative to non-clothing firms – is positive and significant. This suggests that within AGOA beneficiaries, clothing firms are associated with a higher dependence on imported intermediate goods relative to other manufacturing firms, in order to export.

This result helps to further emphasize the importance of the rule of origin component of AGOA. It can be seen as a reflection of the fact that African clothing exporters are largely unable to compete on the international market without being able to access low-cost fabric supply networks as reported by Naumann (2009). It also motivates this study to analyse the effect of this important rule on the type of products that it enables these African firms to export. Before moving on to the composition of the supply response of African firms to AGOA, we look at the actual value of the response in the next sub-section.

[14] Firm characteristic variables are not included in these regressions as this estimation concerns itself with the importance of imports for all types of clothing firms (i.e. those of different sizes, ownership, and skill-level) relative to non-clothing manufacturing firms and thus repeals the need to control for firm-specific characteristics. Instead, we control for which sectors each firm belongs to using sector dummies.

Table 7: Export Participation (Probit regression reporting marginal effects)	
Sample	All manufacturing firms
Import Intensity	0.232 ***
Clothing*Import Intensity	0.0123
AGOA*Import Intensity	
AGOA*Import Intensity*Clothing	0.058 **
Sector Dummies	
Garments	0.118 ***
Food	-0.057 ***
Metals and Machinery	-0.086 ***
Electronics	-0.113 ***
Chemicals and Pharmaceuticals	-0.053 ***
Non-metal and Plastics	-0.086 ***
Other manufacturing	-0.095 ***
Country Dummies	
Ghana	-0.205 ***
Botswana	-0.217 ***
Swaziland	-0.093 *
Tanzania	-0.222 ***
South Africa	-0.093 **
Mozambique	-0.282 ***
Senegal	-0.208 ***
Lesotho	
Mauritius	0.156 ***
Zambia	-0.113 **
Argentina	0.043
Bolivia	-0.209 ***
Columbia	-0.15 ***
Mexico	-0.222 ***
Peru	-0.036
Uruguay	-0.106 **
Chile	-0.123 ***
Ecuador	-0.161 ***
Bangladesh	-0.137 ***
India	-0.128 ***
Sri Lanka	0.199 ***
Vietnam	0.023
Number of obs	10868
Wald Chi2(32)	3144.19
Prob > Chi2	0.000
Pseudo R-squared	0.1391
***** significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.**	

The AGOA effect

Much of the literature advocates that there was a significant apparel export supply response of African countries to AGOA. This sections aims to test this idea using firm-level data. We expect there to be a significant and positive response of apparel firms to the apparel provision, and even more so to the implementation of the special apparel provision.

A triple difference-in-difference estimation technique is used here as it allows for rigorous analysis of policy implementation through exploiting variation in time, country, and product. The panel nature of the data (a panel of firms per country over two periods) allows for this type of estimation technique. The structure of the data allows for the tracking of the same firm over two periods, which are three years apart (for example, data for firms in Ghana are recorded in 2004 and 2007). Table 8 presents a clear structure of the data. A simple exposition of the data is given first, followed by a more detailed discussion of the empirical specification and the corresponding results. Due to data limitations, the effect of AGOA is measured by the change in sales (values in U.S. Dollars)[15] of each apparel firm over a three year period as opposed to the change in U.S. imports of African apparel as used in Frazer and van Biesebroeck (2010).

Figures 5 - 7 illustrate, for each country in this particular data sample, the growth in the value of apparel sales over the indicated three year period. The graph juxtaposes the growth in apparel sales of exporting firms with the overall growth of all apparel firms' sales. The last two bars on each graph represents the average growth for all the countries in that particular region and it can be seen that the South American firms – overall and when just looking at exporting firms – seem to have experienced considerably higher growth than both African and Asian firms.

Focusing on Africa, only firms in South Africa, Mozambique, and Kenya have experienced negative growth, the first two over the period 2004-2007 and for Kenya over the period 2000-2003. It can also be seen that, like in the other two regions, African exporters have experienced a higher level of sales growth compared with the average growth of all apparel firms. Given that the data and literature previously discussed highlighted Africa's poor performance regarding the international trade of apparel prior to 2000 (pre-AGOA), this average positive growth rate in

[15] Sales figures have been deflated using the CPI index of each country and converted to U.S. Dollars using the PPP exchange rate.

years since 2000 leads onto the expectation that the results should show a positive response of African apparel firms to the apparel provision within AGOA.

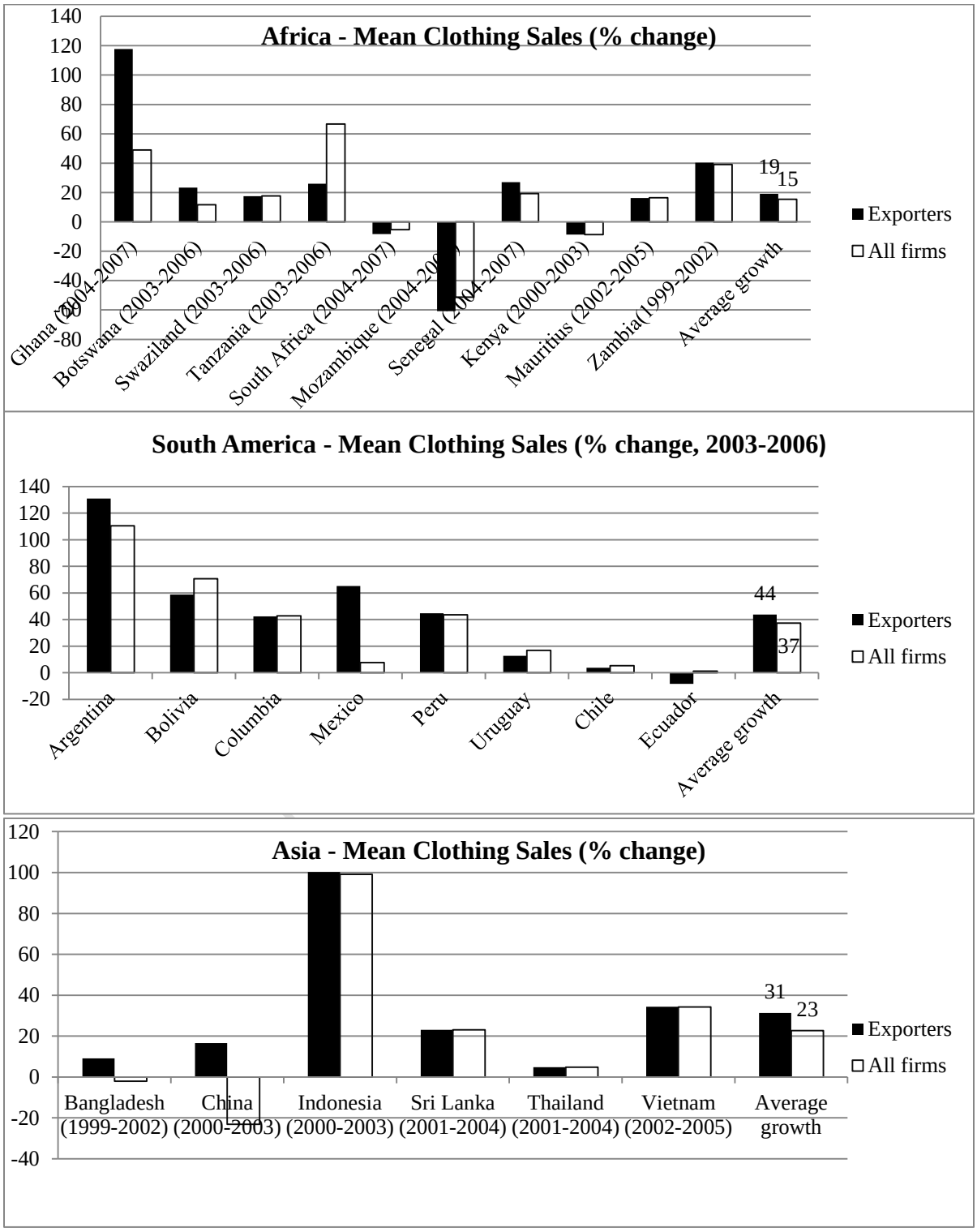

Figure 5-7: Growth in clothing sales for sample countries (5) Africa; (6) South America; and (7) Asia.

Empirical Specification

To test the expectation more rigorously, a triple difference-in-difference technique is implemented. The specific implementation of AGOA may change over time in any given country but are fixed across firms within each country. This leads us to use the differences-in-differences (DD) approach where one could compare the pre-AGOA to post-AGOA change in apparel sales in an African country which had implemented the policy to the change in apparel sales in another country which did not have the policy in place, over the same time period.

Although the advantage of a DD regression is that it makes possible the study of policies other than those that can be described by dummy variables, one must note with caution that DD designs always set up an implicit treatment-control comparison; independent of whether this comparison is a good one (Angrist and Pischke, 2009). The potential downfall here is when the composition of the treatment and controls groups changes as a result of treatment. Therefore, to improve the control groups in the DD design, higher-order contrasts can be used to draw causal inferences – leading to the triple difference-in-differences approach (DDD).

In order to express the triple difference in regression form, we regress sales on three dummy variables, one for each difference – $DAgoa_c$, $Apparel\_start_t$, and $DClothing_s$ – along with the three double interaction terms and the single triple interaction. The variables are defined as follows: $DAgoa_c$, a time invariant variable to mark AGOA-eligible countries as opposed to non-eligible countries; $Apparel\_start_t$ for the AGOA apparel-provision implementation period (time variant); and $DClothing_s$ to indicate firms in the clothing sector. The simplest and most restrictive triple-difference regression specification to measure the size of the AGOA effect is as such:

$$lnSALES_{cst} = \beta_1 DAgoa_c * Apparel\_start_t + \beta_2 Apparel\_start_t * DClothing_s + \beta_3 DAgoa_c * DClothing_s + \beta_4 DAgoa_c * Apparel\_start_t * DClothing_s + country_c + sector_s + year_t + \varepsilon_{cpt}$$

Where,

$$\beta_4 = \{E[Y_{i\,cts}|c = AGOA, t = 1, s = Clothing] - E[Y_{i\,cts}|c = AGOA, t = 3, s = Clothing]\} - \{E[Y_{i\,cts}|c = AGOA, t = 1, s = Other] - E[Y_{i\,cts}|c = AGOA, t = 3, s = Other]\}$$

$$-$$

$$\{E[Y_{i\,cts}|c = non\_AGOA, t = 1, s = Clothing] - E[Y_{i\,cts}|c = non\_AGOA, t = 3, s = Clothing]\} - \{E[Y_{i\,cts}|c = non\_AGOA, t = 1, s = Other] - E[Y_{i\,cts}|c = non\_AGOA, t = 3, s = Other]\}$$

β_4 provides the effect of the variable of interest, the triple interaction term. The first DD term in this equation measures the difference, within AGOA countries, between pre-apparel provision implementation sales and post-implementation sales, of clothing firms relative to other manufacturing firms. By comparing this first DD within AGOA countries to the equivalent DD in non-AGOA countries, we then control for firm-specific trends that are common to AGOA and non-AGOA countries.

This specification is unnecessarily restrictive since all country-firm combinations are lumped into four exclusive groups[16] and each group is restricted to have a single base level of imports (Frazer and van Biesebroeck, 2010). Therefore, the entire less restrictive specification is as follows:

$$lnSALES_{cst} = \beta_1 DAgoa_c * Apparel\_start_t * DClothing_s + country/year_{ct} + sector/year_{st} + country/sector_{cs} + \varepsilon_{cpt} \quad \ldots (1)$$

The interactive fixed effects allow for heterogeneity in (i) the base level of apparel sales of any firm from any apparel provision eligible country; and (ii) the overall apparel sales of a specific country in a given year; and (iii) the overall sales in firms in any apparel-provision eligible country in any year. The regressor of interest, the triple interaction term, indicates firms that originate in least developed African countries in which the apparel provision has been implemented along with the rest of the AGOA policy. This triple-differences model may result in

[16] Firms in least developed AGOA countries and those in least developed non-AGOA countries, and firms in other AGOA countries and those in other non-AGOA countries.

a more convincing set of outcomes than the more traditional DD model, which exploits differences by state and time alone (Angrist and Pischke, 2009). In order to test for the effect of AGOA on those countries eligible for the special apparel provision, relative to other developing countries, the same specification is used – except a $Special\_Rule_t$ variable (marking the LDC beneficiary countries) is used in place of $Apparel\_start_t$.

An alternative specification is used to assess the impact of AGOA on African apparel exporting firms relative to other non-exporting firms:

$$lnSALES_{cft} = \beta_1 DAgoa_c * Apparel\_start_t * Exporter_f + country/year_{ct} + country/exporter_{cf} + exporter/year_{ft} + \varepsilon_{cft} \quad \ldots(2)$$

Here each difference is represented as follows: $DAgoa_c$ to mark AGOA-eligible countries as opposed to non-eligible countries; $Apparel\_start_t$ for the AGOA apparel-provision implementation period; and $Exporter_f$ to indicate firms that participate in export activities. The triple interaction term will be used to assess the impact of AGOA on firms that are eligible for the apparel provision within AGOA and participate in export activities, relative to non-apparel-eligible non-exporting firms.

A potential pitfall

Due to limited availability of firm-level data, the data does not provide the variation in time that is hoped for in a study of this kind. This model hinges on exploiting variation in country, time, and sector – only two of which providing adequate variation here. Using this data, it is not always possible to explore the pre- and post-AGOA difference in sales but it is more a situation of comparing firm sales early in AGOA and then three years later as firms become more established - Table 8 presents the time overlap of the data.

The shaded blocks represent that the country was eligible for the apparel provision in that year and the years in bolded text indicate those countries that were eligible for the further special apparel provision (LDCs). This further suggests that the lack of variation in time may present a

problem for the model since Kenya, Lesotho, and Zambia are the only countries that can exploit pre and post-special provision variation in sales. Furthermore, the dataset lacks any 2000 sales data for Lesotho. Therefore, the DDD results will largely be based on firms in Kenya and Zambia. This is compensated for by including other developing nations that assist in the comparative analysis.

Country	Period (-3)	Period (1)
Ghana	**2004**	**2007**
Botswana	**2003**	**2006**
Swaziland	**2003**	**2006**
Tanzania	**2003**	**2006**
South Africa	2004	2007
Mozambique	**2004**	**2007**
Senegal	**2004**	**2007**
Kenya	2000	**2003**
Lesotho	2000	**2003**
Mauritius	2002	2005
Zambia	1999	**2002**
All South American countries	2003	2006
Bangladesh	1999	2002
China	2000	2003
India	2003	2006
Indonesia	2000	2003
Malaysia	1999	2002
Sri Lanka	2001	2004
Thailand	2001	2004
Vietnam	2002	2005

Table 8: Data Overlap

Results

Results for the triple difference-in-difference analysis of the AGOA effect, using (the logarithm of) apparel sales as the dependent variable, is presented in Table 9. The results for equation (1) are in column 1. The coefficient on the triple-interaction term measures the impact of the apparel provision. It is identified from the change in period (t-3) versus period t sales levels for each firm in each country, controlling for the baseline sales level per firm and general country sales surges that can vary by year. The coefficient estimates indicate that the model fails to find a significant relationship between the apparel provision in AGOA and the change in sales by clothing firms relative to other firms in the manufacturing sector.

Specification 2 incorporates a fourth difference to the variable of interest in order to capture the effect of the apparel provision on apparel firms that export relative to those that do not. The results indicate that the apparel provision is associated with a 12.63% decrease[17] in sales by exporting apparel firms, relative to non-exporting apparel firms.

Table 9. Dependent variable: *lnSALES*		
	1	**2**
DAgoa*Apparel_start*Clothing	0.134	0.567
DAgoa*Apparel_start*Clothing*Exporter		-0.702 ***
Fixed effects	Country/year, sector/year, country/sector	Country/year, product/year, country/product, country/firm, firm/year, product/firm
Observations	21276	23500
F(200, 21076), F(115, 23385)	7724.99	14418.43
Prob>F	0.0000	0.0000
R-squared	0.9826	0.9844
Root MSE	1.9276	1.8294
***** significant at the 1% level; ** significant at the 5% level; * significant at the 10% level**		

[17] Calculated as: e(0.567-0.702)-1

Replacing the *Apparel_start*$_t$ variable with the *Special_Rule*$_t$ in order to measure the effect of the special apparel provision on LDC beneficiary countries relative to non-beneficiary countries, Table 10 (Appendix B) provides the results. The conclusions drawn here are very similar to those in the previous regression. Both these regression results are inconsistent with the majority of the literature that has aimed to estimate this affect. Since the earlier data analysis supports a positive growth in the African apparel industry, this model then fails to attribute this to the AGOA preference. The failure of the model to pick up any major difference between the LDC beneficiary countries and the other AGOA countries (South Africa and Mauritius) is due to the lack of variation as was explained earlier.

Since we have not used the U.S. import value of African apparel as the dependent variable (due to lack of available data), we look at the marginal affect of AGOA on exporting firms – expecting to see the greatest positive impact of AGOA on firms that export. Column 1 of Table 11 presents the results of a simple double-difference model, which does not lead to any significant results. The results for the DDD model, as in equation (2), are found in column 2. Here, the coefficient on the variable of interest – the triple-interaction – measures the impact of the AGOA apparel provision on firms that export relative to those that do not. These estimates do not allow any significant conclusions to be draw about the impact of the AGOA apparel provision on apparel sales for exporting firms.

Table 11. Dependent variable: *lnSALES*		
	1	**2**
DAgoa*Apparel_start	-0.161	
DAgoa*Apparel_start*Exporter		-0.027
Fixed effects	Country, year	Country/year, exporter/year, country/exporter
Observations	6776	6756
F(32, 6744), F(81, 6675)	14940.99	7626.35
Prob>F	0.0000	0.0000
R-squared	0.9829	0.9865
Root MSE	1.8838	1.6809
***** significant at the 1% level; ** significant at the 5% level; * significant at the 10% level**		

These results on the estimated size of the impact of AGOA is in contrast to other studies - Edwards and Lawrence (2010) estimate the marginal impact from the third-country fabric special rule relative to non-beneficiary AGOA countries at 13.9 percent (2001 – 2008 period); Frazer and van Biesebroeck (2010) report this figure at 38.4 percent; and Portugal-Parez (2008) at 303 percent for the top 7 beneficiaries.

A major contributing factor may be the hampered ability of the model to compare the pre- and post-AGOA variation in sales due to the data's limited time variation – which may have allowed larger estimates. In essence, given the overlap of the data presented in Table 8, the model is only estimating the impact for Kenyan and Zambian firms since these are the only countries in this data set that move from non-eligibility in period (*t*-3) to becoming eligible in period *t.* (Lesotho lacks the 2000 sales data so does not enter the triple difference model). The availability of more suitable data will lead to a remarkable improvement in the ability of the model to accurately estimate the impact of the AGOA fabric provision on the export performance of firms in AGOA-eligible countries.

Sales growth

Therefore, since the model cannot accurately measure the pre- and post-AGOA variation in sales, the focus shifts to estimating the impact that AGOA's apparel provision has had on the growth of apparel sales for each firm in specified years after the implementation of AGOA. To investigate this impact, an OLS regression is estimated and the results are presented in Table 12. The dependent variable is calculated for each firm as the ratio of sales in period (t) over the sales in period (t-3).

To determine the marginal effect on sales growth of the apparel provision, the interaction term between the AGOA dummy and the clothing sector dummy reveals that apparel firms in AGOA-eligible countries are associated with a higher sales growth relative to those in non-AGOA countries. This result is in line with the majority of the literature, which attribute AGOA-eligible countries' improved apparel export performance to AGOA's apparel provision.

On the other hand, the negative coefficient on the interaction term between the special apparel provision dummy variable and the clothing sector dummy suggests that, within AGOA-eligible

countries, firms in LDCs experienced lower sales growth than those not eligible for the special fabric rule. This is contrary to existing literature and to the earlier exposition of the data.

Table 12. Dependent variable: *Sales_Growth*		
	1	
DAgoa	-6.279	***
Special_Rule	2.454	*
DAgoa*Clothing	4.241	***
Special_Rule*Clothing	-3.338	**
Fixed effects	Sector/year	
Observations	21276	
F(63, 21213)	113.5	
Prob>F	0.0000	
R-squared	0.0103	
Root MSE	62.249	
***** significant at the 1% level; ** significant at the 5% level; * significant at the 10% level**		

Value Added

	Value Added (U.S. $)				
	Mean	Mean (Log VA)	Median	Value Added/ Sales	Freq
Country					
Argentina	4,077,453.00	13.75	931,533.90	0.54	101
Bolivia	1,546,979.00	12.35	229,404.00	0.62	45
Chile	1,937,874.00	13.48	609,348.20	0.56	85
Columbia	2,740,143.00	12.97	328,793.80	0.59	160
Ecuador	1,908,159.00	13.66	882,674.40	0.48	31
Mexico	1,879,870.00	13.07	407,856.80	0.71	240
Peru	2,294,248.00	12.97	524,926.40	0.46	87
Uruguay	1,478,350.00	12.52	259,000.00	0.53	43
South America	**2,232,884.50**	**13.10**	**466,391.60**	**0.60**	**792**
Bangladesh	2,886,468.00	13.81	1,059,554.00	0.40	68
India	9,006,873.00	12.87	340,647.30	0.40	426
Indonesia	18,700,000.00	12.15	226,228.40	0.59	285
Sri Lanka	4,665,479.00	13.58	1,095,724.00	0.53	173
Thailand	8,667,739.00	14.61	1,927,405.00	0.47	349
Asia	**8,785,311.80**	**13.40**	**763,503.50**	**0.48**	**1301**
Botswana	2,179,050.00	12.32	155,198.10	0.60	21
Swaziland	4,562,642.00	14.23	1,227,858.00	0.80	17
Tanzania	725,694.30	11.79	112,036.10	0.64	24
Zambia	3,984,864.00	14.02	1,113,049.00	0.43	18
Ghana	114,796.10	10.94	61,628.05	0.64	40
South Africa	3,004,619.00	13.18	542,244.30	0.58	114
Mozambique	468,676.50	11.66	94,112.57	0.53	15
Senegal	154,015.80	10.94	52,327.21	0.57	21
Africa	**1,899,294.71**	**12.39**	**133,617.10**	**0.60**	**270**

Table 13.

The third focus of the paper is on the composition of AGOA-eligible exports. The two studies that directly deal with issues of the impact of AGOA on the composition of Africa's exports that were reviewed in this paper - Rolfe and Woodward (2005) and Edwards and Lawrence (2010) – both found evidence of the increased apparel exports from Africa to the U.S. being driven by lower-end low value-added garments. Furthermore, the theoretical model also promotes the idea that the special apparel provision would promote the exports of high fabric-content garments. This section aims to test the idea about whether the apparel export response has been driven by the export of high-fabric intensive, low value-added products.

Investigating the firm level value added data, presented in Table 13, a very clear conclusion can be drawn. On average, African clothing firms add considerably less value to their production output when compared to their South American and Asian counterparts. Of the nine African countries for which this data is available, firms in only three of them record a value added figure in excess of 1 million U.S. Dollars. Four of the five Asian countries and five of the eight South American countries exceed this level of value added. However, the absolute level of value added can be seen as a measure of the size of a firm which then suggests that African apparel firms are on average smaller than their counterparts in the other two regions.

Thereby, looking at the value added for each firm as a share of sales provides a clearer picture of the level of sophistication of the goods produced by each firm. Here it can be seen that African and South American firms have the same level of value addition to sales ratio, which is higher than that of Asian apparel firms.

This is contrary to the literature that suggests that African clothing firms produce lower quality garments that are simpler in design and require fewer embellishments. It is also contrary to the idea that since African firms have access to cheap fabric through the special fabric provision of AGOA, the fabric can be minimally assembled into basic garments and exported through the tariff-free preference. However, to test this idea further, a simple OLS regression is conducted using the ratio of value added to sales as the dependent variable and the result are presented in Table 14.

Table 14: Dependent variable (Value Added/Sales)		
	1	**2**
Exporter	-0.03 ***	
AGOA (dummy)	0.61 ***	0.60 ***
South America (dummy)	0.50 ***	0.62 ***
Asia (dummy)	0.61 ***	0.49 ***
AGOA*exporter		0.004
South America*exporter		-0.07 ***
Asia*exporter		-0.02
Number of obs	2363	2363
F(4, 2359), F(6, 2357)	3804.290	2583.12
Prob > F	0.000	0.000
R-squared	0.860	0.8605
Root MSE	0.217	0.21634
***** significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.**		

The first specification makes use of the exporter dummy variable along with the three regional dummy variables. All the coefficients are highly significant and the results suggest that exporting firms are associated with lower value addition. Asian firms are associated with the smallest ratio of value added to sales and African and South American firms indicate the same contribution of value added to sales. This is consistent with the analysis of Table 13, however, not so with the literature.

Since it may be that exporters are bringing down the value added to sales ratio for Asia (and Asia dominates international apparel trade), the second specification interacts each regional dummy with the exporter dummy. Looking at the difference between exporters and non-exporters, the results suggest that the contribution of value added to domestic sales is lowest in Asian firms, followed by African firms, and thus South American firms are associated with the highest ratio of value added to domestic sales.

No conclusions can be drawn about the difference in the level of value added to sales for African firms that export compared to those that do not. The coefficient representing this same marginal effect for South American firms is negative and significant, suggesting that exporting firms produce lower value added goods compared to firms that only supply the domestic market.

VII. Conclusion

The marginalization of Africa from world trade has been extensively documented and the background data looked at early in this paper provided further evidence. Therefore, with the challenge of the development of the African continent remaining pertinent, the United States extended a unilateral trade preference scheme to selected African countries – the details of which having already been discussed.

With this in mind, the aim of this paper is to assess the impact of the trade preference scheme on African apparel firms through two dimensions – the value and the composition of the export supply response – the second of which has largely been neglected. The initial look at the data combined with the literature review emphasized three important issues: (i) there was a clear export response of African apparel firms to AGOA; (ii) the rule of origin under AGOA was highly beneficial to LDCs that experienced a large export supply response; and, on the other hand, was detrimental to both South Africa and Mauritius – with both being unable to qualify for the special rule; and (iii) it has been found, by looking at the composition of African apparel exports under AGOA, that the scheme encourages the export of low-value added and high fabric-intensive products.

In order to investigate these three points more clearly, this paper is built around a firm-level mathematical model. The model shows precisely how the ROO differs from the more traditional export tariff. Although AGOA has removed the tariff, it still implements the ROO. It is seen that the tariff affects the overall level of exports but it is the ROO that affects the relative demand of high fabric-intensive goods compared to low fabric-intensive goods. Since the ROO allows firms in eligible countries to import cheap fabric, the model illustrates how this has a relatively greater affect on the price of a high fabric-intensive good, which increases its demand relatively more than the demand for a low fabric content good.

The importance of imported intermediate goods to African firms was then established. This was a necessary step due to the ROO requirement that allowed LDC beneficiary countries to source intermediate fabric from third-party countries and still export to the U.S under the preference. The initial data analysis supports the expectation in that African clothing exporters are highly dependent on imported inputs, more so than African clothing producing non-exporters and Asian

and South American clothing exporters. The regression results again confirm the earlier analysis and emphasize the importance of imported inputs to production for African apparel firms relative to other manufacturing firms within the same region.

The AGOA effect was then estimated using a triple difference-in-difference approach. Not many significant conclusions can be drawn from the model given the major problem of a lack in time variation of the data due to the limited availability of firm-level data This model hinges on exploiting variation in country, time, and product – only two of which providing adequate variation here. The results here are thus inconsistent with the literature review.

A cursory look at the determinants of sales growth over the respective three year period for each country revealed, in part, results that are in line with existing literature. It was found that apparel firms in AGOA-eligible countries are associated with higher sales growth relative to those in non-AGOA countries.

Lastly, the paper analyzed the level of local value addition of African firms relative to the other developing economies. The data clearly indicates a low level of value added recorded by African firms, however, this is more indicative of the size of African apparel firms relative to those in the other two regions. The data on the ratio of value added to sales indicate that African and South American firms contribute a greater share of value added to sales relative to Asian firms, suggesting the production of more sophisticated apparel goods in the former two regions. This is inconsistent with the literature. The regression results on this front are ambiguous and represent an area for further study.

Time series data is needed to analyse the evolution of the contribution of value added to sales since the implementation of AGOA, in order to gain a better understanding about whether or not there have been any changes in the level of sophistication achieved by African apparel firms. A more detailed understanding of how the rule of origin requirement affects the type of exports from AGOA-eligible countries is vital within the context of trade and development. This understanding will allow a more accurate measurement of the benefits that accrue to these countries through trade preferences – not only in terms of the value of exports but also in terms of the dynamic benefits such as skills development and other forms of quality upgrading; both of these being crucial elements in the process of economic development.

Appendix A

Table 5: Variable descriptions

	Variable Name	Description
Firm-specific characteristics	Exporter	Dummy variable – takes on the value of 1 is the firm is an export; 0 if not.
	Import Intensity	The percentage of total inputs that are of foreign origin.
	Age (log)	Log of years since the firm began operations in the country.
	Size (log)	Log of total number of permanent and temporary employees.
	Skill intensity	Ration of skilled production workers to total number of production workers.
	Foreign Ownership	Dummy variable – takes the value of 1 is the firm is 100% owned by a foreign company.
	E-mail	Dummy variable – takes a value of 1 if the firm regularly uses e-mail in its interactions with clients.

Appendix B

Table 10. Dependent variable: *lnSALES*		
	1	**2**
DAgoa*Special_Rule*Clothing	0.134	0.559
DAgoa*Special_Rule*Clothing*Exporter		-0.689 ***
Fixed effects	Country/year, sector/year, country/sector	Country/year, product/year, country/product, country/firm, firm/year, product/firm
Observations	21276	21240
F(200, 21076), F(238, 21002)	7724.99	7521.47
Prob>F	0.0000	0.0000
R-squared	0.9826	0.9854
Root MSE	1.9276	1.7701
***** significant at the 1% level; ** significant at the 5% level; * significant at the 10% level**		

References

Angrist, J., & Pischke, J. (2009). *Mostly Harmless Econometrics.* Princeton and Oxford: Princeton University Press.

Baylies, C., & Wright, C. (1993). "Female Labour in the Clothing and Textile Industry of Lesotho". *African Affairs*, Vol. 92, No. 369, pp. 577-591.

Bernard, J., Jensen, J., Redding, S., & Schott, P. (2007). "Firms in International Trade". *National Bureau of Economic Research Working Paper 13054*.

Besley, T., & Case, A. (2000). "Unnatural Experiments? Estimating the Incidence of Endogenous Policies". *The Economic Journal*, Vol. 110, No. 467, pp. F672-F694.

Coe, D. T., & Hoffmaister, A. W. (1999). "North-South Trade: Is Africa Unusual?". *Journal of African Economies*, Vol. 8, Number 2, pp. 228-256.

Collier, P. (1995). "The Marginalization of Africa". *International Labour Review*, Vol. 134, Iss. 4-5, pp. 54.

Collier, P., & Venables, A. J. (2007). "Rethinking Trade Preferences: How Africa Can Diversify it's Exports". *The World Economy*, pp. .

Dollar, D., Hallward-Driemeier, M., & and Mengistae, T. (2006). "Investment Climate and International Integration". *World Development*, Vol. 34(9), pp. 1498-1516.

Edwards, L., & Lawrence, R. (2010). "AGOA Rules: The intended and unintended development consequences of Special Fabric Provisions". *Prepared for Meeting of NBER Africa Project held in Accra, Ghana in July 2010.*

Edwards, L., Rankin, N., & Schoer, V. (2008). "South African Exporting Firms: What Do We Know and What Should We Know?". *Journal of Development Perspectives*, 4 (1): 93-118.

Flatters, F., & Kirk, R. (2003). *"Rule of Origin as Tools of Development? Some Lessons from SADC*. Retrieved 2009, from http://qed.econ.queensu.ca/facualty/flatters/main/writins/html

Frazer, G., & van Biesebroeck, J. (2010). "Trade Growth Under the African Growth and Opportunity Act". *The Review of Economics and Statistics 92(1)* , pp. 128-144.

Gereffi, G. (1999). "International Trade and Industrial Upgrading in the Apparel Commodity Chain". *Journal of International Economics*, Vol. 48, pp. 37-70.

Gibbon, P. (2003). "The African Growth and Opportunity Act and the Global Commodity Chain for Clothing". *World Development*, Vol. 31, No. 11, pp. 1809-1827.

Hummels, D., & Skiba, A. (2004). "Shipping the Good Apples Out? An Empirical Confirmation of the Alchian-Allen Conjecture". *The Journal of Political Economy, Vol. 112, No. 6*, pp. 1384-1402.

Kaplinsky, R., & Morris, M. (2008). "Do Asian Drivers Undermine Export-Oriented Industrialisation in SSA?". *World Development*, Vol. 36, No. 2.

Mas-Collel, A., & Whinston, M. (1995). *Microeconomic Theory*. New York: Oxford University Press.

Mattoo, A., Roy, D., & Subramanian, A. (2003). "The African Growth and Opportunity Act and Its Rules of Origin: Generosity Undermined?". *The World Ecomony*, 26(6) pp. 829-851.

Morris, M. (2006). "China's Dominance of Global Clothing and Textiles: Is Preferential Trade Access an Answer for Sub-Saharan Africa?". *IDS Bulletin*, Vol. 37, No. 1, Institute for Development Studies.

Morris, M. (2006b). "Globalisation, China, and Clothing Industrialisation Strategies in Sub-Sahran Africa". In H. Jauch, & R. Traub-Merz, *"The Future of the Textile and Clothing Industry in Sub-Saharan Africa"* (pp. pp. 36-53). Germany: Friedrich-Ebert-Stiftung.

Naumann, E. (2009). *"AGOA at nine: some reflections of the Act's impact on Afric-US trade"*. Retrieved 2009, from http://www.agoa.info/index.php?view=download&story=research

Ng, F., & Yeats, A. (1997). "Open Economies Work Better! Did Africa's Protectionist Policies Cause It's Marginalisation in World Trade?". *World Development*, Vol. 25, No. 6, pp. 889-904.

Nicita, A., & Razzaz, S. (2003). "Who benefits and how much? How gender effects welfare impacts of a booming textile industry". *World Bank Policy Research Working Paper 3029*.

Olarreaga, M., & C., O. (2005). "Agoa and Apparel: Who Captures the Tariff Rent in the Presence of Preferential Market Access". *The World Economy, 28 (1)*, pp. 63-77.

Oyejide, T. A. (2010). "World Trade Order and Agricultural Transformation in Africa". *Journal of African Economies*, Vol. 19, AERC Supplement 2, pp. ii40-ii59.

Portugal-Parez, A. (2008). "The Costs of Rules of Origin in Apparel: African Preferential Exports to the United States and the European Union". *UNCTAD, Study Series No. 39. United Nations Publications.*, pp. .

Rankin, N., Soderbom, M., & Teal, F. (2006). "Exporting from Manufacturing Firms in Sub-Saharan Africa". *Journal of African Economies*, 15(4) 671-687.

Redding, S., & Venables, A. (2004). "Geography and Export Performance: External Market Access and Internal Supply Capacity". *NBER, Volume Title: Challenges to Globalisation: Analysing the Economics*.

Rolfe, R., & Woodward, D. P. (2005). "African Apparel Exports, AGOA, and the Trade Preference Illusion". *Global Economy Journal*, Vol. 5, No. 3, Article 6.

Santos-Paulino, A. U. (2002). "Trade Liberalisation and Export Performance in Selected Developing Countries". *The Journal of Development Studies, Vol. 39, No. 1*, pp. 140-164.

Standing, G. (1989). "Global Feminization Through Flexible Labour". *World Development*, Vol. 17, pp. 1077-1095.

UNCTAD. (2003). *"Trade Preferences for LDCs: An Early Assessment of Benefits and Possible Improvements"*. New York and Geneva: United Nations.

Yeats, A. J., Amjdi, Reincke, & Ng. (1996). "What caused Sub-Saharan Africa's Marginalisation in World Trade?". *Finance and Developement*, 33 (4), pp. 38-41.