The Costs of Rules of Origin in Apparel:
African preferential exports to the US and to the EU

Alberto PORTUGAL-PEREZ*

University of Geneva

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ABSTRACT

The EU and the US offer simultaneously preferential market access to exports of a group of African countries. Although similar in the extent of preferences for apparel, a key sector for LDCs, these agreements differ in the rules of origin (RoO) . While EBA and Cotonou requires yarn to be woven into fabric and then made-up into apparel in the same country or in a country qualifying for cumulation, AGOA grants a special regime to "lesser developed countries" allowing them the use of fabric from any origin and still meet the criteria for preferences, making a case for a natural experiment. This paper aims to assess econometrically the impact of different RoO on exports of these African countries. The main finding is that relaxing RoO by allowing the use of fabric from any origin increased significantly exports of apparel by about 300% for the top seven beneficiaries of AGOA's SR, and broadens the range of apparel exported by these countries.

1. Introduction

A group of Sub-Saharan African, mostly composed by Least Developing Countries (LDCs), has preferential market access to the US under the African Growth Opportunity Act (AGOA) and to the EU under either the Cotonou agreement or the Everything but Arms (EBA) initiative. These arrangements are examples of non-reciprocal Preferential Trade Agreements (PTAs) in which Northern countries extend enhanced market access, at least temporarily, to developing countries in order to promote their integration into the world trade system and to contribute to their development.

Among sectors eligible for trade preferences under these agreements, the textile sector is a key one for many developing countries. Indeed, from all stages in the production of clothing, apparel assembly is the one that is the most intensive in low-skilled labour. Since this factor is relatively abundant in developing countries, they have a comparative advantage in engaging in low-wage cost operations.

Although the extent of preferential access for apparel to the US market provided by AGOA is similar (measured by an average US MFN tariff of 11.5% in 2004) to the one provided by EU's preferential regimes (about 11.9% in 2004), these agreements have different product-specific rules of origin (PSRO) that determine the criteria for apparel to be entitled for duty-free access under these preferences. RoO are justified to prevent trade deflection, or re-exporting foreign apparel purchased at a lower price while pretending it is produced in the country. At the same time, RoO are used as protectionist devices that increase the costs of production in the beneficiary country.

PSRO for apparel under EBA or under ACP, require a "double transformation" process in which yarn should be woven into fabric in the beneficiary country or in a country qualifying for cumulation under EU schemes, and then made-up into apparel in the beneficiary (yarn→fabric→apparel). In contrast, AGOA grants a "Special Rule (SR) for "Lesser Developed Countries". It allows them to use third-country fabric and still meet the criteria for AGOA preferences, meaning that African producers can purchase fabric from cheaper sources. Thus, under the SR, the PSRO for apparel consists of a "single transformation" requirement (fabric→apparel). As noticed by Brenton and Özden (2006), a specific apparel product produced in a qualifying African contry using third country fabrics can gain preferential access to the US but not to the EU.

Compared to EBA and ACP provisions, the AGOA-SR has altered the relative incentives of these Sub-Saharan African (SSA) producers selling to the US and EU market by removing any restriction on the origin of fabric used to produce clothing. By the end of 2004, twenty-two African countries qualified for AGOA-SR and at the same time benefited from EU preferential market access.

From an econometric point of view, this situation where a group of African countries mainly export to two markets under similar extent of preferential access and are confronted to different RoO regimes, provides an unusual 'natural' experimental situation to help isolate the effect of different RoO on the use of trade preferences.

By taking advantage of this natural experiment, this paper aims to assess econometrically the impact of the two different regimes of RoO on apparel exports by these African countries to the US and to the EU. To my knowledge this work is the first one to do so. The main findings are that after controlling for other factors, relaxing RoO by allowing the use of fabric from any origin increased significantly apparel exports to the US by about 300% for the top seven African exporters of the studied group, as well as enlarged the range of exported apparel.

The rest of the paper is organized as follows. Section 2 describes the extent of preferential market for African apparel to the EU market under EBA and ACP, and to the US market under AGOA, as well as the respective RoO regimes. To motivate our econometric estimates, section 3 develops a model in a monopolistic competition framework in which African producers sell to the US and to the EU and abide to RoO when selling to the latter provoking a rise in production costs. Section 4 provides a brief description of the empirical methodology, the data and the results. Finally, section 5 concludes.

2. RoO and EU and US Preferential market access for African apparel

As the empirical part of this papers covers the period 1996 to 2004, this section describes the evolution of market access and RoO for apparel under the EU and US schemes during this period.[1]

2.1. EU preferential agreements and apparel.

GSP and EBA

Since 1971, EU countries set up a preferential scheme for developing countries, known as the Generalized System of Preferences (GSP). Tariff reductions were conceded under the GSP scheme on eligible goods, including apparel, from particular countries subject to the compliance of certain conditions stipulated by the EU, such as RoO, to benefit from trade preferences.

RoO were defined in 1993 under the EU GSP scheme. More precisely, RoO required that apparel should be manufactured from yarn and sometimes wholly produced. Production from yarn entails that a <u>double transformation process</u> must

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[1] RoO were defined in 1993, by Regulation (EEC) No. 2454/93. See Appendix 3 for a synthesis of RoO for apparel under the different agreements described in this part and an account of the legal texts defining them.

take place in the beneficiary country with the yarn being woven into fabric and then the fabric cut and made-up into clothing.

In 1999, EU efforts to harmonize the RoO across its different PTAs were translated in a so-called "single list of product-specific rules of origin (PSRO)" that was implemented in its GSP scheme in July 2000. The "single list" of PSRO provisions generalized the "double transformation process" to all apparel lines grouped under chapter 61 and 62 of the HS classification. For a few varieties of non-knitted apparel (CH-62), an alternative VC rule was also extended allowing the use of non-originating fabric provided that its value did not exceed 40% (or 47.5% in a smaller number of lines) of the final product price. Thus, an exporter of non-knitted apparel designated for this alternative VC rule under preferences was able to choose between the "double transformation rule" or the less restrictive VC rule allowing a percentage of non-originating material that could be purchased from cheaper sources.

The EU GSP system also accepted bilateral cumulation[2] between the EU and a beneficiary country. Regional cumulation could also take place but only within three regional groupings: ASEAN, CACM, and the Andean Community, but not amongst African countries.[3]

As an extension of the EU GSP scheme, the EBA initiative was applicable from March 2001 on a group of 50 GSP-eligible countries and provided duty-free access. It has the advantage of removing exceptions existing under the preceding GSP scheme and much of the resulting uncertainty in market access. However, duty-free access for apparel to the EU market rests on similar criteria with the same "single-list" of PSRO and bilateral cumulation between beneficiary countries and the EU, as in previous GSP system.

ACP

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[2] *Cumulation* allows producers from a PTA to import non-originating materials from other member countries without affecting the final product's originating status. There are three types of cumulation rules: bilateral, diagonal and full cumulation. Bilateral cumulation applies to trade between two partners stipulating that producers in country A can use inputs from country B without affecting the final good's originating status provided that the inputs are themselves originating in B (i.e. satisfying the area's RoOs). Under diagonal cumulation, producers can use materials originated in *any* member country to the PTA as if the materials were originating in the country where the processing is undertaken. Finally, under full cumulation, all stages of processing or transformation of a product within the PTA can be counted as qualifying content regardless of whether the processing is sufficient to confer originating status to the materials themselves. For a description of the different EU cumulation schemes, see:
ec.europa.eu/taxation_customs/customs/customs_duties/rules_origin/preferential/article_779_en.htm

[3] In addition, the regional cumulation was constrained by the requirement that the value-added in the final stage of production exceeds the highest customs value of any of the inputs used from countries in the regional grouping.

The Cotonou agreement with African, Caribbean and Pacific (ACP) countries was signed on 23 June 2000. It is an extension to four previous agreements known as the four Lomé conventions that lasted for 25 years. However, it is generally accepted that the ACP countries were unsuccessful in taking advantage of their preferential status. Indeed, the share of ACP non-oil exports in EU imports declined from 6.1 percent to 2.9 percent over the period 1975-1992.

Under the Cotonou agreement, the provisions for PSRO for T&A were also drawn from the "EU single list". However, while EBA, or GSP, limits cumulation to a bilateral basis between a beneficiary country and the EU, the Cotonou agreement authorizes full cumulation among African countries, so that regional fabrics can be used in the making of apparel without losing originating status. Therefore, countries eligible to ACP preferences that are also eligible to EBA, may, and indeed often do, prefer to continue exporting under the ACP regime, in part, due to the more liberal cumulation scheme existing under the latter. Besides, the ACP agreement attaches extensive conditions to potential cumulation with non-ACP countries including South Africa.

2.2. US preferences for apparel: AGOA

On May 18th 2000, the African Growth and Opportunity Act (AGOA) was signed into law by the US President, as a means to contribute to the development in Africa. AGOA provided tariff-free access for some important goods to most developing countries that were excluded by the standard US GSP programme, such as watches, footwear, handbags, luggage, work gloves, as well as apparel[4],. Currently, there are 37 countries eligible for trade preferences under AGOA.

RoO for apparel under AGOA were designed in the spirit of the triple transformation process for apparel prevalent under some other US preferential trade agreements such as NAFTA or the Caribbean Basin Initiative (CBI). RoO require that all the intermediate stages take place either in a beneficiary country or in the US. More precisely, AGOA provides quota-free and duty-free treatment to apparel assembled in one or more AGOA eligible country from US fabrics, which in turn are made from US yarn. African apparel made from fabric formed in another beneficiary African country is tolerated provided that the fabric was made from US yarn and in an amount not to exceed an applicable percentage[5].

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[4] The US allowed GSP treatment to some categories of handicraft textiles under signature of an agreement to guarantee certification that the items are handmade products of the exporting beneficiary. Nevertheless, none of the textiles eligible to this "handicraft textiles arrangement" were classified into CH-61 or CH-62, which are the apparel articles examined in this paper.

[5] Initially, the applicable percentage was equal to 1.5 percent of the aggregate square meter equivalents of all apparel articles imported into the United States in the preceding 12-month period for which data are available, beginning October 1, 2000, increased in each of the seven succeeding 1-year periods by equal increments, so that for the period beginning October 1, 2007, the applicable

However, as mentioned in the introduction, a "Special Rule (henceforth known as SR) for Lesser Developed Countries" was set to relax standard RoO for apparel by confering duty-free access to apparel regardless of the origin of fabric used to produce it, and gave rise to a single-transformation requirement (fabric →apparel).[6]

In order to benefit from the AGOA SR, countries must show that they "have in place an effective visa system to prevent illegal trans-shipment and use of counterfeit documentation, as well as effective enforcement and verification procedures" as stated by the US administration.

Apparel qualifying for the SR is also subject to the cap.[7] However, the cap is defined in terms of square meter equivalent not in monetary terms, which may encourage exporting higher quality apparel with more value. Besides, Olarreaga and Özden (2005) noticed that the cap of three percent of total US imports , growing to seven per cent over an eight-year period is far from binding, since apparel exports under AGOA provisions are currently less than one per cent of total US imports in these sectors.

2.3. A natural experiment

By the end of 2004, twenty-two countries benefited from the Special Rule under AGOA. Besides, all twenty-two countries benefited from preferential market access to the EU under ACP, and fifteen of them also qualified for EBA preferences. Since no additional preferences were granted for apparel from ACP countries under EBA, all of the 22 countries are on an equal foot for EU preferences on apparel.

While clothing assembled from fabric imported from outside the bloc or the EU is considered as originating under the AGOA SR and can be exported tariff-free to the US, it is not recognized as originating under EU preferential schemes. This situation allows me to control for the impact of the RoO on preferences while

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percentage does not exceed 3.5 percent. Then this applicable percentage has been "doubled" by an amendment to AGOA, known as AGOA II

[6] The SR, which has been recently extended until 2015, was initially addressed to lesser developed countries, defined by having a GDP per capita lower than 1500 US dollars in 1998, as measured by the World Bank. Nevertheless, some countries with higher level of GDP per capita were appointed to benefit from the Special Rule (SR) such as Botswana and Namibia, which were designated by an act amending some AGOA provisions in 2002 (known as AGOA II). After intensive effort undertaken by its government, Mauritius, another country with a higher GDP per capita, was entitled the benefits of the SR in December 2004. As the period covered by this paper ends in 2004, Mauritius is not considered as a beneficiary of the SR given it was only designated at the very end of our period covered and the US apparel imports from this country did actually fall in 2004.

[7] The same cap explained before applies. In the case of Mauritius, the cap is limited to only 5% of the Special Rule cap, about 27 million square meter equivalents (SMEs).

controlling for other factors such as market access extent and importers' revenue. Figure 2.1 depicts the evolution of the average EU and US MFN tariffs during the period covered in this paper. Both average tariffs declined slowly and the initially small difference between them has been reduced.

Figure 2.1 here: US and EU MFN average tariffs

Table 2.1 lists the 22 countries that are simultaneously eligible to the SR under AGOA as well as to ACP or EBA, ranked by decreasing order of total exports to the US and EU in 2004. The first columns show their export volume to the EU and US and the last column shows the starting date for special apparel provision which varies from country to country.

Table 2.1 here: Countries benefiting from the AGOA Special Rule in 2004

Data on utilization rates show high rates of utilization of preferences when exporting to the EU under EBA or Cotonou, and when importing to the US under AGOA. Indeed, utilization rates of preferences for apparel imported by these 22 countries were 97.4 % for AGOA and 91.2% for EBA or Cotonou[8]. In spite of high utilization rates under EU and US schemes, export volumes evolved quite differently.

Figure 2.2   Apparel exports of 22 countries benefiting from AGOA-SR by 2004

Figure 2.2 shows the evolution of export volumes to the US and to the EU from the 22 countries benefiting from simple transformation rule under the AGOA-SR. Prior to 2000, the path of African apparel exports to the US and to the EU are alike. Then apparel exports to the US increased substantially with the timing of the change in the growth path coinciding with the entry into force of AGOA in 2000. By contrast, the value of exports to the EU of this same group of countries stays relatively flat from 1996 until 2000 and then declined, mainly because of the political crises that hit Madagascar, the largest exporter to the EU, at the end of 2001, provoking their exports to fall. Madagascar exports amounts to 85% of the group's apparel exports to the EU, as seen in last column of table 2.1.

Indeed, after elections took place in Madagascar in 2001, the incumbent president, Didier Ratsiraka, refused to leave the power to his rival, Marc Ravalomanana, even after an official recount confirmed the latter as the winner of the election. The outcome was a political deadlock that lasted for many months having provoked

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[8] A utilization rate of preferences is defined as the percentage of imports entering into a country on a preferential basis with respect to total imports. The figure on utilization rates for EU preferences in 2004 was obtained from EUROSTAT. Utilization rates for US preferential schemes can be more easily obtained since USITC collects and makes available the program under which imports enter the US.

violent clashes between partisans and a blockade of the capital. According to the Financial Times, "the blockade led to severe petrol shortages and to the collapse of the fast-growing textile industry with the loss of about 150,000 jobs. Textile companies warned that orders from European and US clothing retailers had dried up" [9].

Figure 2.3 here: US apparel imports from top 7 exporters

Madagascar accounts for 27% of the observations in the reduced sample and the consequences in terms of export losses from 2002 are visible in figure 2.3, which shows US apparel imports from Madagascar as well as from the other six main exporters. To take into account this negative shock in Madagascar's exports in our estimates, we define a dummy variable that controls for apparel exports reduction in 2002, as will be further explained in section 4.

The differential pattern of exports to the US and to the EU is striking given that African apparel complying with ROO had duty-free access to the EU during the whole period under GSP or ACP agreements, whereas preferential access to the US market for apparel was granted only from 2000 under AGOA. The central role of RoO easily noticed when summing-up exports will latter be assessed econometrically at a fairly disaggregated level.

Not all countries seem to have fully benefited from enhanced market access to the US and the leniency of RoO conceded by the SR. Among countries qualifying for the AGOA SR, seven countries had accounted for the overwhelming majority of exports during the covered period as seen in figure 2.2. These are Botswana, Kenya, Lesotho, Madagascar, Malawi, Namibia and Swaziland. Each exported apparel to the US for at least 10 million USD in 2004 and their exports accounted for 97.7% of apparel exports to the US and EU from the 22 countries benefiting from the SR in 2004.

Apparel products are divided into two main categories: knitted (CH-61) and non-knitted (CH-62).[10] The EU imports more knitted apparel than non- knitted. This pattern is in line with Brenton and Özden's (2005) claim that RoO are more costly for non-knitted apparel than for knitted apparel since they imply that fabric has to come from either the EU or another beneficiary country, as it happens with the double transformation rule under EU schemes, whereas for knitted items this rule is less costly to satisfy since there is typically no fabric involved.

After AGOA was implemented, exports of knitted apparel to the US become larger than non-knitted exports. A possible explanation is that machines for knitted apparel are less expensive than machines for non-knitted apparel.

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[9] « Madagascar set for national unity government", June 17, 2002, Financial Times).
[10] Figure A.2.1 in Appendix 2 depicts US and EU imports of knitted and non-kintted apparel from the 22 countries beneficiaries from AGOA-SR.

3. Model

A simple model is now sketched to show the effects of a RoO on costs and to motivate the econometric estimates.

On the supply side, African apparel (X) is assembled by combining value added with intermediate good (fabric or textiles) under a Leontief technology with an input-output coefficient, a_V: $X = \min\left\{ f(K,L); \dfrac{V}{a_V} \right\}$. Two types of fabric are distinguished according to their source with textiles from each source considered a perfect substitute with textiles from the other source. First, V^{EU} represents fabric produced either domestically or imported from countries qualifying for cumulation under EU schemes at price p_V^{EU}. Second, V^* designates inputs imported from the rest of the world at price p_V^*. Let V denote the total quantity of intermediate used in the production of apparel, that is $V = V^{EU} + V^*$, since textiles are assumed to be perfect substitutes.

Let $\varphi(X)$ be the value added cost function dual to the value added production function, $f(\ )$, and $\varphi'(X) \equiv d\varphi(X)/dX$ the corresponding marginal cost function.

Perfect substitutability of intermediates implies that in the absence of origin requirement, producers will choose the cheapest source, as under the special regime for "lesser developed countries" under AGOA. The marginal cost of apparel exported to the US is:

$$MC_X^{US}(\ ) = \varphi'(X) + a_V \min\left\{ p_V^{EU}, p_V^* \right\} \tag{1.1}$$

To qualify for EU preferences under EBA or ACP, African exporters have to use fabric qualifying for cumulation at least in proportion r, with binding RoO specifying a minimum value content r (for simplicity expressed here as a proportion of total intermediate use). When $p_V^* > p_V^{EU}$, then $V = V^{EU}$ and expression (1.1) also describes the marginal cost of apparel exported to the EU. But, when $p_V^{EU} > p_V^*$, the RoO becomes binding and the marginal cost of apparel qualifying for preferences under EBA or ACP is expressed by:

$$MC_X^{EU}(\ ) = \varphi'(X) + a_V \left[rp_V^{EU} + (1-r) p_V^* \right] \tag{1.2}$$

Reflecting the small size of African producers, assume that price of textiles $\left(p_V^{EU}, p_V^* \right)$ is fixed. Therefore, MC_X^{US} is also constant and $MC_X^{EU}(r)$ is an increasing function of the content requirement r under EBA and ACP ($dMC_X^{EU}(r)/dr > 0$).

Let p^k be the internal price of African apparel in country k, $k \in K = \{EU, US\}$. Then, $p^k = (1 + t^{k,pref})q^k$, where $t^{k,pref}$ is the tariff applied to African apparel by country k, and q^k is the border price (excluding tariff) of African apparel sold in market k.

On the demand side, a representative consumer prizing variety maximizes his utility function. Then, the demand function for African apparel in country k, X_D^k, is given by:

$$X_D^k\left(p^k, Y^k, P_w^k\right), \text{ with } \partial X_D^k / \partial p^k < 0, \ \partial X_D^k / \partial Y^k > 0, \text{ and } \partial X_D^k / \partial P_w^k > 0 \qquad (1.3)$$

where Y^k is the income of country k; P_w^k is a market price index of apparel substitute to African apparel that is imported under the MFN regime from other countries, such as Asian imports that were also subject to quotas. Then, $P_w^k = \overline{P^*}\left(1 + t^{k,MFN}\right)$ with $\overline{P^*}$ being the composite border price of apparel imported on a non-preferential basis and subject to an MFN tariff $\left(t^{k,MFN}\right)$.

Profit- maximizing pricing for sellers of African apparel implies:

$$p^k(\ ) + \frac{\partial p^k(\ )}{\partial X^k}\ X^k = \left(1 + t^{k,pref}\right)\ \left(MC_X^k\right). \qquad (1.4)$$

where $p^k(\ )$ is the inverse demand function of country k.

Totally differentiating expression (1.4) leads to:

$$\frac{dX^k}{dY^k} > 0, \frac{dX^k}{dt^{k,pref}} < 0, \frac{dX^k}{dt^{k,MFN}} > 0 \text{, for } k \in K = \{EU, US\}\text{, and } \frac{dX^{EU}}{dr} < 0 \qquad (1.5)$$

which establishes that a binding RoO (such as the double transformation rule) reduces export sales of EBA/ACP beneficiaries (see Appendix 1 for the derivation).

The basic intuition behind the results is highlighted in Figure 3. The effect of decreasing the Value Content (VC) requirement is shown in figure 3.1. As a consequence, lower costs are reflected in an increased volume of African imports. Likewise, granting preferential access to African exports are translated into a reduction of the preferential tariff, $t^{k,pref}$, at which African imports complying with the RoO requirement are subject. Again, lower costs support higher imports of African apparel.

Figure 3.1 here: The effects of:

Figure 3.1.b illustrates the consequence of preference erosions provoked by a reduction of MFN tariffs. Since substitutes to African apparel become cheaper,

demand for African apparel shifts back cutting MR of apparel sellers causing
African imports to shrink. Equivalently, a negative revenue shock decreases
demand for African apparel as well as the marginal revenue (MR) of African
apparel sellers, cutting down apparel imports in country k.

4. Evidence

Based on the results of the model above and assuming linear relationship, we
estimate:

$$\ln\left(1 + X_{i,t}^{j,k}\right) = \beta_0 + \beta_1\left(R_{i,t}^{j,k}\right) + \beta_2\left(VC_{i,t}^{j,k}\right) + \beta_3\left(t_{i,t}^{k,mfn}\right) + \beta_4\left(t_{i,t}^{j,k,pref}\right)$$

$$+\beta_5 \ln\left(Y_t^k\right) + \beta_6 D_i^{Madag-02} + \sum_{j\in J}\sum_{k\in K}\delta_{j,k}\left(D_i^j \times D_i^k\right) + \varepsilon_{i,t}^{j,k} \tag{1.6}$$

$$j \in J = \{7 (\text{or } 22) \text{ African exporters}\}$$
$$k \in K = \{EU, US\}$$
$$t = 1996,...,2004$$
$$i \in (CH61\text{-}CH62)$$

where :
- $X_{i,t}^{j,k}$ are exports of apparel variety i from African country j to country k (EU or
US) in year t.
- $R_{i,t}^{j,k}$ is a dummy variable set equal to one if country j benefits from the AGOA-SR
allowing the use of textiles from any source and still qualifying for preferences
$(k = US)$ in year $t (\geq 2000)$, and zero otherwise.
- $VC_{i,t}^{j,k}$ is a dummy variable taking the value one if non-knitted apparel (CH-62) of
variety i is subject to an alternative (or optional) regional VC rule allowing apparel
non-qualifying for cumulation provided that its value does not exceed 40% (or in
some cases 47.5%) of the product price in year $t (\geq 2000)$ when exporting on a
preferential basis to the EU $(k = EU)$, and zero otherwise.
- $t_{i,t}^{k,mfn}$ is the MFN tariff applied on apparel product i by importer k in year t.
- $t_{i,t}^{j,k,pref}$ is the preferential tariff applied on apparel product i imported from j
that benefits from country k's preferential regime when complying with RoO.
Preferential tariffs are set equal to the MFN tariff prior to the implementation of a
preferential agreement and set equal to zero once a preferential regime is
implemented[11]
- Y_t^k is GDP of country k in year t.
- $D_i^j \left[D_i^k\right]$ is a dummy variable controlling for unobserved fixed effects by exporter j

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[11] Since countries benefited from GSP preferences for apparel to the EU at the beginning of the
covered period, preferential tariff for apparel exported to the EU is equal to zero for the whole
period, whereas the US only grants preferential market access to apparel exports under AGOA in
2000.

[importer k]

- $D_i^{Madag-02}$ is a dummy controlling for Madagascar's export loss in 2002 provoked by its political crises, as explained before. It is equal to one when the exporter is Madagascar in t=2002 and zero, otherwise.

- $\varepsilon_{i,t}^{j,k}$ is the error term.

We use a logarithmic transformation in the dependent variable equation (1.6) in order to avoid giving too much weight to apparel lines with a high-volume of exports; however, the use of logarithms brings in a truncation problem for observations with zero-exports. To address this issue, we shift all export values by one dollar before applying the logarithmic transformation, which increases the mean of exports by one unit, but does not affect its variance. In addition, tariff lines with zero exports are linked to zero values of the dependent variable $(\ln(1+X_{i,t}^{j,k}))$ once the correction is done. Then, Tobit estimation appropriately accounts for the censorship of the dependent variable.

Notice that PSRO take the form of a regional value content in equation (1.4), whereas in specification (1.6) they are represented by two dummy variables. The first one, $R_{i,t}^{j,k}$, captures the presence of the "single transformation" rule under the SR introduced by US AGOA. The second one, $VC_{i,t}^{j,k}$ is a dummy capturing the effect of an alternative VC requirement that is tolerated for some non-knitted apparel under EU preferential regimes that allows 40% (or 47.5%) of non-originating materials. This alternative rule adds flexibility to the "double transformation rule" prevalent in EU preferential regimes and has been established under GSP scheme in July 2000 and in 2001 under the Cotonou.

Exporter and importer country-pair dummies $\left(D_i^j \times D_i^k\right)$ are added to the model to control for unobserved fixed effects specific to each pair of exporter-importer countries that potentially affect trade in apparel, such as the distance or the presence of a common language. Notice that export or import-specific dummies cannot be added into the model because of multicollinearity.

According to (1.5), expected coefficient signs are: $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0$ and $\beta_5 > 0$. For the dummy controlling Madagascar's export loss, we expect: $\beta_6 < 0$. To control for unobserved year-specific effects, time-dummies were added to the model. Yet, none of their coefficients were significant as if no unobserved effect specific to a single year was left unexplained by all other dependent variables. Therefore, all time-dummies were taken away from all specifications.[12]

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[12] Two other variables were not considered in the model as their coefficients were not statistically significant when included in the regressions: a dummy controlling for the difference between knitted (CH-61) and non-knitted apparel (CH-62) and an index of importer j's real exchage rate. For the former variable figure A.2.1. in the Appendix shows that paths of knitted and non-knitted apparel imports is similar.The latter variable was expected to capture the potential effect of the real

4.1. Data

Our panel covers 236 varieties of apparel exported to two destinations, EU and US, at the HS6 data level in two samples: a full sample encompassing all 22 countries benefiting of the AGOA-SR, and a reduced sample comprising only the seven larger exporters among them. We mainly base our analysis on the limited sample since the seven countries account for an overwhelming share of apparel exports. For each African country, we only include apparel-lines having positive exports to at least one of the destinations for at least one year .

The estimation is carried out on a panel covering the period 1996-2004, which coincides with the removal of quotas set out at the end of the Agreement on Textiles and Clothing (ATC) in January the 1st, 2005. Although the choice of the period was constrained by data availability, the episode is a convenient one since there is no need to control for the removal of quotas at the end of the ATC. In a post-ATC world, US and EU markets are expected to be flooded by apparel from larger exporters, such as China and India, that were previously bounded by quotas.[13]

Export data and tariff data were compiled from IDB-WTO and TRAINS/WITS at the HS-6 digit level of aggregation, the most disaggregated level for international comparison purposes. GDP is expressed in constant 2000 US dollars and was compiled from the World Development Indicators.

The starting date of effective eligibility for the special clothing provision, which varies across beneficiaries, is not usually set on January, the 1st of a given year over the period 2001-2004, as shown previously in table 2.1. Given that trade data is collected on an annual basis, we set the dummy $R_{i,t}^{j,k}$ equal to one for the first year if country j has benefited from eligibility to benefits of the apparel provision for more than four months.[14] For instance, Botswana and Malawi are eligible from August 2001, then the dummy is set equal to one for t = 2001 and evidently for successive years (t ≥ 2002).

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exchange rate on African apparel imports demand, based in the principle that a real exchange rate appreciation is expected to boost demand for imports. In this context, we did not find evidence that real exchange movements are related to the volume of African apparel imports. Moreover, one could have expected that an appreciation of the US dollar with respect of the Euro could have contributed to the rise in exports to the US compared to exports to the EU, as depicted in Figure 2.2. In reality, however, the US dollar depreciated steadily during that period, passing from 0.94 (USD/Euro) at the end of 2000, to 1.05 at the end of 2002, and to 1.36 at the end of 2004.

[13] After 2004, the US and EU share of apparel imported from China did not increase as expected since the EU and the US managed to keep barriers on imports from China.

[14] Estimates do not vary substantially when choosing a different number of months to define $R_{i,t}^{j,k}$.

Descriptive statistics are shown in table 4.1 for the reduced sample and for the full sample.

Table 4.1 here: Descriptive statistics

4.2. Results

As the dependent variable involves either positive or zero numbers, the econometric specification is set-up as a Tobit model, which takes into account its censored nature. In this context, the estimated coefficients of a Tobit model are not interpretable from a pure economic point of view, since they are merely the effect of the independent variables on the "latent" dependent variable underlying the Tobit model. We report two types of marginal effects. First, the marginal effect on the "unconditional expected value" (labelled as *Uncond.*) is interpreted as the effect of a marginal change in an independent variable (or a one-unit change in a dummy) on the expected value of the dependent variable, taking into account that some observations have zero exports. Since the dependent variable is $\ln\left(1 + X_{i,t}^{j,k}\right)$, unconditional marginal effects (when small) can be approximated to a percentage change of exports due to a marginal change in an independent variable. Second, the effect on the "probability of uncensored variable" (labelled as. *Prob Uncens.)* indicates how the probability of observing an uncensored dependent variable or (equivalently in this context) observing strictly positive exports is modified following a marginal change in an independent variable (or a one-unit change in a dummy). The overall fit for the models summarized in the likelihood-ratio values and the McKelvey and Zavoina pseudo-R^2 values (at the bottom of the table) are reasonable.[15]

Table 4.2 here: Estimation results

The last row of table 4.2 reports the value of ($e^{\left(Uncond\left(R_{i,t}^{j,k}\right)\right)} - 1$) for each specification, which is a transformation that gives a better approximation of the percentage change of exports due to the Special Rule (a unit-change of $R_{i,t}^{j,k}$), when $Uncond.R_{i,t}^{j,k}$ is big.[16]

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[15] There exist many alternative pseudo-R^2 for Tobit models. The statistic reported is the McKelvey-Zavoina's pseudo-R^2 which according to Veall and Zimmermann (1996) performs the best in Tobit models even compared to the widely used McFadden pseudo- R^2.

[16] Both types of marginal effects (*Uncond* and *Prob Uncens.)* can be expressed as the product of the estimated coefficient and a positive "correction term" specific to each type. In table 4.2, "a" columns report the estimated coefficient, and the marginal effects are reported in columns "b" and "c". Each type of "correction term" is a function of the values set for all independent variables (here evaluated at 1999, the year before the SR went into effect). Moreover, both types of "correction terms" are

Columns 1a to 1c report estimates for equation (1.6) (specification 1). All coefficient signs are as expected. The same applies to other specifications in table 4.2. In specification 1, as shown at the bottom of column 1b, the elimination of the restriction on the origin of fabric by the SR is associated with an increase of exports by a factor of 3.03 (=303 %) when correcting the unconditional marginal effect to provide a better approximation of the relative rise of exports.[17] [18]

Concerning tariff rates, since its unconditional marginal effects are small, a one percent decrease in the MFN tariff, $t_{i,t}^{k,mfn}$, is associated with a decrease in African apparel exports of about 6 percent, *ceteris paribus*. Symmetrically, a percentage point decrease in preferential tariffs $t_{i,t}^{k,pref}$ is related to an increase in exports of 6 percent. The high responsiveness of apparel imports to a change in tariffs can be attributed to the high protection prevalent in the apparel sector in the EU and in the US and to the huge rents involved.

The marginal effect of ln(Y) on the expected value of $\ln\left(1+X_{i,t}^{j,k}\right)$ can be interpreted as an income elasticity of the demand for African apparel imports. In specification 1, this elasticity is equal to 3,11.

The presence of an alternative VC requirement for some non-knitted apparel (CH62) is associated with an increase of more than 45% in exports in these lines. Not surprisingly, easing-up the EU double transformation rule by allowing just a percentage of non-qualifying fabric is associated with an increase in exports smaller than simply removing restrictions on the origin of fabric, as under the AGOA SR. Madagascar's export loss in 2002 due to its political crises is about 35%, as captured by the unconditional marginal effect of $D_i^{Madag-02}$.[19]

The theoretical model in section 4 describes the effect of different variables on the volume of exports, and not on the range of exports. To inspect how exports

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comprised between zero and one implying that the estimated coefficient in column "a" is the upper-bound of the marginal effects given at the bottom of the table (i.e. 475% vs 303% for specification 1).

[17] When restricting the natural experiment to US imports before and after AGOA, by reducing the sample only to African exports to the US, the marginal effect of the SR does not change significantly, going slightly up to 323% (not reported here).

[18] To check whether $R_{i,t}^{j,k}$ is well-specified, we define two other SR-dummies for all countries by supposing that the SR started one year after the baseline year at which the original $R_{i,t}^{j,k}$ was defined, as well as one year before it. When replacing $R_{i,t}^{j,k}$ by these "misspecified" dummies, the estimated pseudo-R² were indeed smaller.

[19] Dummies controlling for additional Madagascar export loss in successive years are excluded, since their coefficients are not significant.

diversification takes place, data available at the firm-level or at the plant-level is required. Nevertheless, the change in the probability of having positive exports induced by a change in a regressor can be computed at the tariff line with the Tobit model without additional data. Columns "c" in table 4.2 report these marginal effects (labelled as *Prob Uncens.*)

As seen in column 1c, there is a 13% higher probability of having positive exports on tariff lines benefiting from the SR induced by $R_{i,t}^{j,k}$, This can be interpreted as evidence on the role of the SR on export growth at the extensive margin (i.e. having a greater probability of exporting varieties that would not be exported in the absence of the SR). Indeed, easing-up RoO cuts down exports costs under preferential arrangements, which creates an incentive to export diversification.

These results are confirmed in figure 5.1 showing the evolution of the number of tariff lines with positive exports from Kenya, Lesotho, Madagascar and Swaziland which are the 4 major exporters in the bloc. With the exception of Madagascar, all countries export more varieties of apparel to the US than to the EU at the end of the period. The range of apparel exported to the US increased faster than the range exported to the EU after 2000, the year AGOA was implemented, even for Madagascar.[20]

Figure 5.1 here: Variety of apparel exported by the 6 largest exporters to the US

Compared to other African exporters, Madagascar's exports follow a different path due to its political crisis in 2002, as seen in figure 2.3. Since Madagascar is the largest exporter of apparel in our group and accounts for about a third of all observations in the reduced sample, we remove Madagascar from the sample to estimate specification 2, in order to confront these estimates to the previous ones. For subsequent estimates, the discussion is mainly focused on variables related to RoO and their unconditional marginal effects, as other estimates do not diverge substantially across specifications.

The effect of the SR on expected exports go up to a 3.96 factor (=396%), as shown in last row of column 2b. Indeed, removing Madagascar from the sample makes appear other exporters as having relatively benefited more from AGOA's SR. On the other hand, the effect of the alternative VC requirement on exports to the EU goes down and is no longer significant. This result is coherent with the fact that Madagascar is by far the largest exporter to the EU and, then, a main beneficiary of the flexibility provided by the alternative VC requirement under EU preferences.

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[20] Since data is used at the HS-6 level of aggregation, the most disaggregated level for the purpose of international comparison, new varieties exported are not detected at more disaggregated levels, say at the HS-8, when at least one variety from the same HS-6 category was already exported.

In specification 3, we consider the whole sample of 22 countries eligible to SR (columns 3a-3c). Here, the exports growth rate due to the SR goes down to 0.96 (=96%). As expected, this figure, which represents the "average" effect of the special provision on apparel is smaller than in previous specifications, since countries not managing to increase exports significantly were included in the sample, even if they were appointed as eligible to the AGOA-SR.[21] The marginal effect of ln(Y) is now equal to 2.37, a more plausible value that do not vary greatly in next specifications.

To estimate how the effects of AGOA-SR on exports evolve every year in which a beneficiary country benefits from the special program, we include three additional dummy variables ($R2_{i,t}^{j,k}$, $R3_{i,t}^{j,k}$, and $R4_{i,t}^{j,k}$) to specification (1.6) that capture the supplementary or cumulative effects on exports of an additional year under the SR program. $R2_{i,t}^{j,k}$ is equal to one if country j is <u>at least</u> in the <u>second year</u> after being entitled to the SR program (which includes the third and the fourth year), and zero if not. Likewise, $R3_{i,t}^{j,k}$ is unit if country j is <u>at least</u> in the <u>third year</u> of the SR program (including the fourth year), and zero otherwise. The same applies for $R4_{i,t}^{j,k}$. Then, the coefficient of $R_{i,t}^{j,k}$ no longer captures the average effect on exports of benefiting from the SR, but only the cumulative effect of being at the first year under the SR program. It follows that the coefficient of $R2_{i,t}^{j,k}$ captures the additional or cumulative effect of the SR on exports at the second year in the program, the coefficient of $R3_{i,t}^{j,k}$ captures the cumulative effect on exports after the third year, and the one of $R4_{i,t}^{j,k}$ the cumulative effect after the fourth year.

Since the beginning of eligibility for clothing provisions is usually not set in January, we consider that a country is in its first year in the special regime for apparel if it has been designed as such at latest in August of a given year, as for the definition of $R_{i,t}^{j,k}$. Setting a different month for defining the first year of eligibility does not change significantly the results. One should keep in mind that some countries did not reach the fourth year under the SR program in 2004, the last year of our panel.

Table 4.3 here: Estimation results: Temporal effects of RoO

Columns 4a-4c in table 4.3 show the estimates carried out on the reduced sample of the seven exporters. Instead of the marginal effect on the probability of being uncensored, column 5c reports the approximate exports growth rates computed

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[21] Estimates of subsequent specifications were carried out on the reduced sample of top seven exporters. For comparison purposes, Appendix 4 reports estimates of all following specifications carried out on the full sample of 22 countries.

from the marginal effects of the dummies dealing with RoO [22]. Estimates show a positive change of exports growth rate during the first three years, (although $R3_{i,t}^{j,k}$ is not significant), and a negative and non-significant change for the last year. The biggest change in exports growth is registered during the first year. This is evidence that preferential exports increased immediately after the implementation of the SR. According to corrected unconditional marginal effects reported in column 4c, exports increase on average by 140% after the first year, and by 200% (=140%+ 60%) after the second year.

When removing Madagascar from the reduced sample (specification 5), the marginal effects of all SR coefficients go slightly up. All of them are now positive and the cumulative effect for the third year becomes significant. According to estimates, exports increase on average by 147% after the first year, by 220% (=148%+72%) after the second year and by 262%(=220%+42%) after the third year. There is evidence of "dynamic learning effects" as export growth rates for countries benefiting from the SR keep increasing for at least the first three years of the program. Again, VC is no longer significant, once Madagascar is removed from the sample.

Finally, the last two specifications (7 and 8) in table 4.4 seek to estimate the differentiated effect of SR provisions on exports across countries. In the original specification, $R_{i,t}^{j,k}$ is replaced by interaction terms between country-specific dummies and $R_{i,t}^{j,k}$. Specification 6 is carried out on the reduced sample of seven countries and Madagascar is removed when estimating specification 7.

Table 4.4 only reports the estimates for RoO dummies since other coefficients have similar values to those in previous specifications. To ensure comparability of marginal effects across countries, the dependent variables are set equal to their mean values in 1999 for each country separately when computing the unconditional marginal effects related to this country. Columns 6 b and 7b report the marginal effects for each country, whereas marginal effects per country are corrected in columns 6c and 7c. As seen from estimates for the seven larger exporters, the effect of AGOA-SR on exports is positive and significant for all seven countries. The effect of the SR on exports from Malawi and Namibia are found to be the biggest in both specifications, even if those countries are not the largest exporters in the sample. The reason is that, compared to other countries in the sample, these countries exported a small volume of apparel in 1999, the baseline to compute the marginal effects (see figure 2.3) so that a small increase in exports after AGOA appears to be greater in relative terms, the lower the volume of exports in the base line.

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[22] In next estimates, the "probabilities of uncensored variable" are no longer reported, see Appendix 4 to consult them.

When Madagascar is taken out of the sample in specification 7, the marginal effects for the remaining countries are magnified, although the ranking of the relative importance of marginal effects across countries remains unchanged.[23]

Table 4.4 here: Estimation results: RoO effects by exporters

As robustness checks, similar estimates (not reported here) were carried out for all seven specifications with a random effects tobit model providing similar estimates. The same applies for marginal effects that have been evaluated setting independent variables at different values. We also computed standard errors for all coefficients using the robust Hubert-White sandwich estimator to account for potential heteroskedasticity and found that their values similar to the ones appearing in our tables.

5. Conclusions

This paper has quantified the effect on exports of loosening of RoO for apparel produced in SSA countries that consisted in the removal of restrictions on the origin of intermediates granted by the "Special Regime" SR of AGOA. The study leads to several conclusions. First, taking advantage of this quasi natural experiment setting whereby exports from SSA to the EU and the US approximately benefited from the same preferential margin of 10% in both markets under EBA and AGOA, and controlling for other factors, we found that AGOA's (SR) raised apparel exports from the seven main exporters by about 300%. None of the coefficients for unobserved year-specific effects, time-dummies were significant suggesting, at first sight, the absence of mispecification. This large effect is particularly noteworthy since a more standard evaluation based solely on the high utilization rates of preferences might erroneously conclude that the special ("double transformation" requirements) in T&A had little effects.

Secondly, the detailed analysis at the product level revealed that less restrictive RoO are associated with an expansion of the range of exported apparel. Indeed, under preferential market access, more lenient RoO diminish costs for exporters and may encourage exports diversification or exports growth at the extensive margin. To my knowledge, this is the first evidence indicating the effects of RoO on export diversification.

Third, the results suggest learning effects. With respect to the dynamic effects of AGOA's SR, we found evidence that the uptake of preferences is gradual over time, taking place during the first three years a country benefits from the SR.

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[23] Since the VC is no longer significant when removing Madagascar from the sample, it is removed from the last specification. However, when proceeding with a country-specific decomposition of VC on the sample of seven exporters (in an analogous way to the decomposition for the SR dummy) only VC coefficients for Madagascar and sometimes Botswana are positive and significant.

The research also revealed that the impact of the AGOA SR on exports is different across countries. Since the SR was not introduced the same year for all countries, these results are strongly suggestive that differences in RoO accounted for differences in performance. However because we could not control for factors that might have influenced supply response (e.g. the quality of infrastructure, political and social stability, governance, fiscal policies aiming to attract foreign investment), we could not account for the uneven effects of SR across countries.[24]

To conclude, strict RoO have often been justified as a means to support more processing in developing countries by encouraging integrated production within a country, or within groups of countries through cumulation schemes, as in the case of T&A. However, at least in the case of T &A, RoO have a perverse effect as they discourage developing exports at the intensive margin as well as at the extensive margin through product diversification which contributes to reducing volatility. In sum, the results in this paper suggest that development-friendly policies would benefit from relaxing the stringency of RoO requirements.

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[24] For instance, Lesotho, one of the successful exporters, managed to attract foreign investment in the textiles industry by offering a low corporate tax and further tax concessions for locating factories in towns outside Maseru, the capital. Furthermore, the political and social environment was felt by foreign investors as more stable after a period of political instability. The result was a sudden increase in foreign investment mainly originating from Asia and Lesotho became one of the largest exporters to the US among countries eligible to the AGOA-SR. For an early account on the successful case of Lesotho, see: "Lesotho seen as gateway to US market: Trade agreements have eased access for investors and helped diversify employment opportunities for locals" August 23, 2001. Financial Times.

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Tables and figures of

The Costs of Rules of Origin in Apparel:

African preferential exports to the US and to the EU

by Alberto Portugal-Pérez

Figure 2.1
US and EU MFN average tariffs
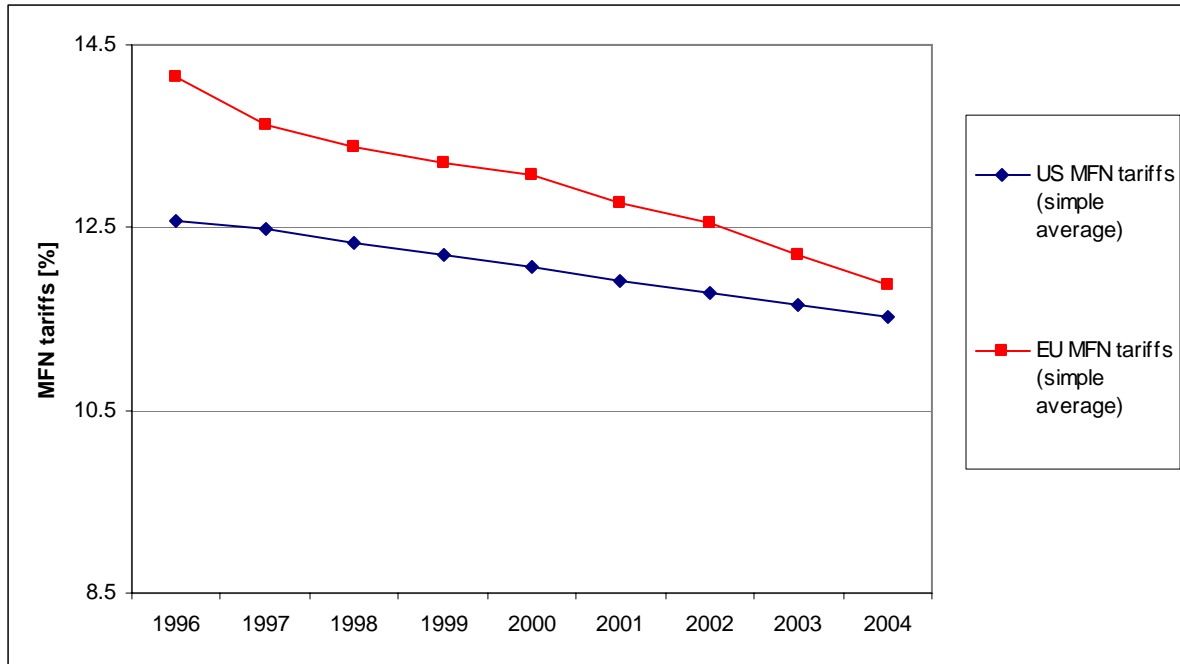
Source: Author's calculations on data from WTO Integrated Data Base.

Figure 2.2

Apparel exports of 22 countries benefiting from AGOA-SR by 2004
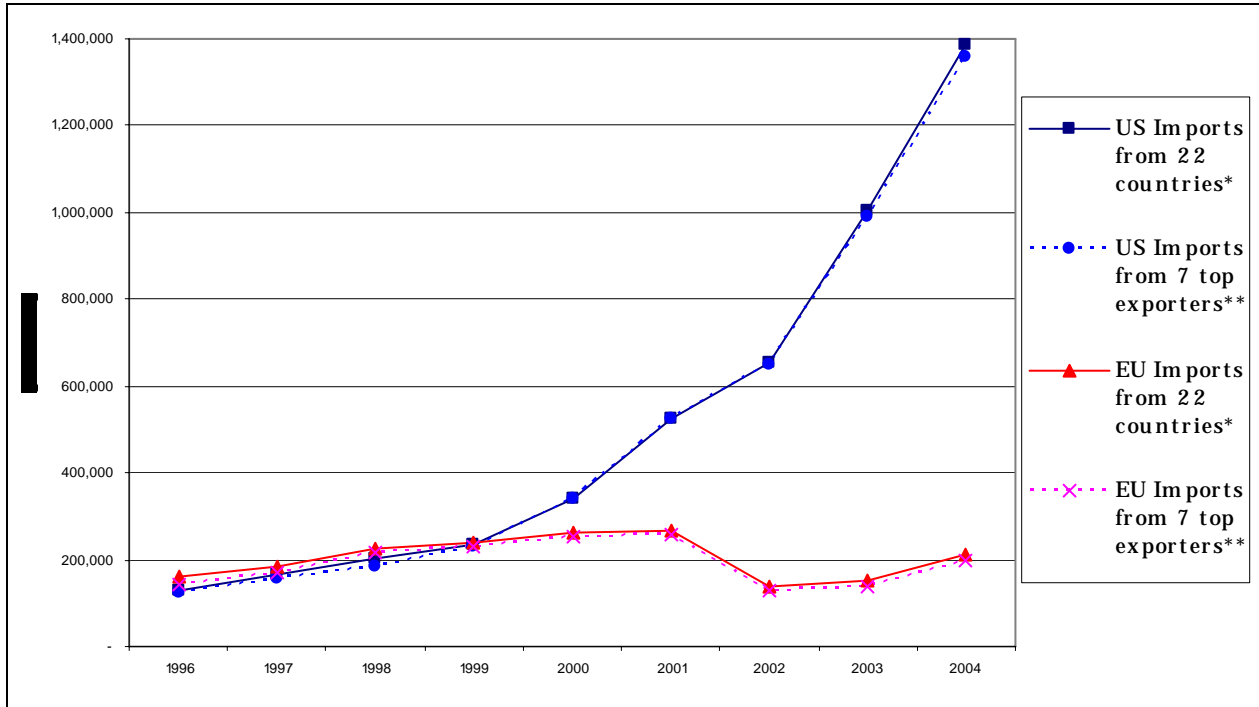
*The 22 Sub Saharan countries benefiting from AGOA-SR by 2004 as well as ACP are: Benin, Botswana, Cameroon, Cape Verde, Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Swaziland, Tanzania, Uganda, and Zambia.

*The top 7 exporters are : Botswana, Cameroon, Ghana, Kenya, Lesotho, Madagascar, Namibia, Nigeria, and Swaziland

Source: Author's calculations on data from WTO Integrated Data Base.

Figure 2.3

US apparel imports from top 7 exporters
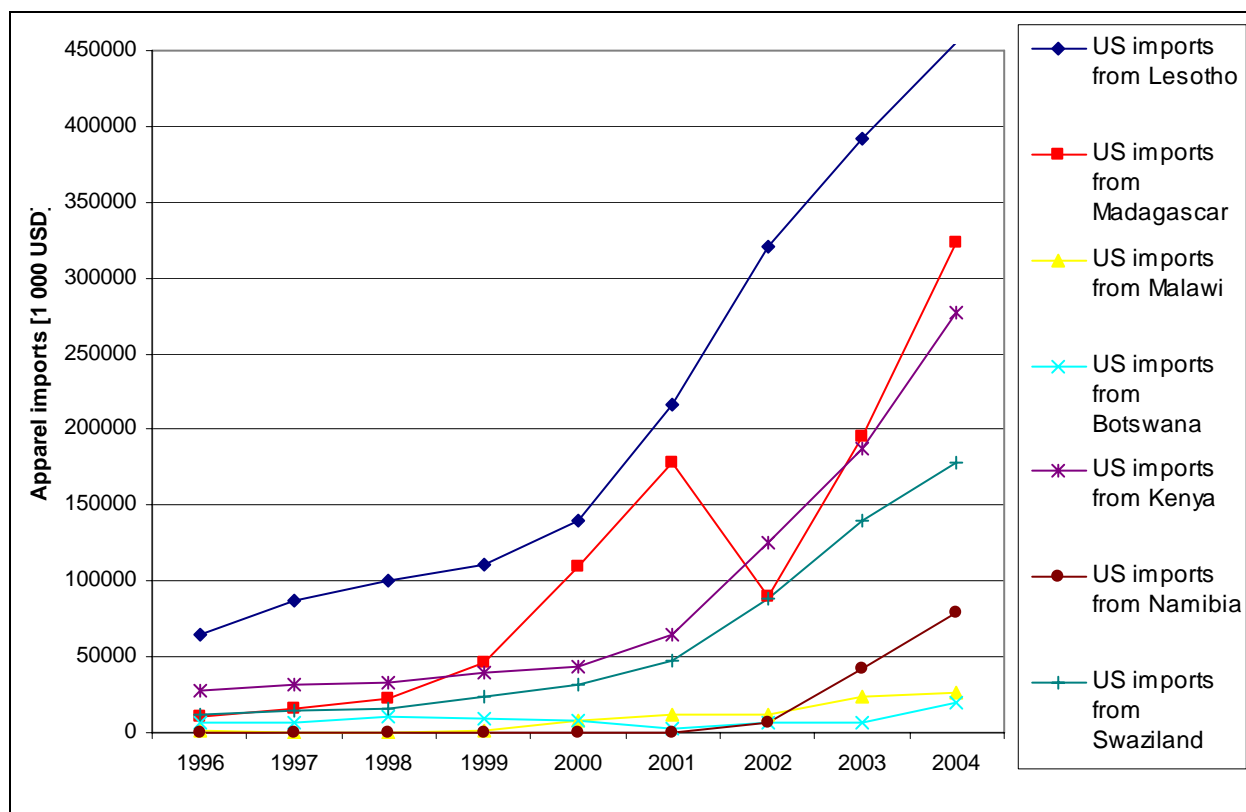
Source: Author' calculations on data from WTO Integrated Data Base.

Figure 3.1

The effects of:

p^k

$X_D^k\left(p^k, Y_A^k, P_w^k\right)$

$\left(1+t_A^{k,pref}\right)MC_X^k\left(r_0\right)$

$\left(r_0 > r_1\right)$

$r\downarrow$

$\left(1+t_A^{k,pref}\right)MC_X^k\left(r_1\right)$

MR_1

X_0^k X_1^k X^k
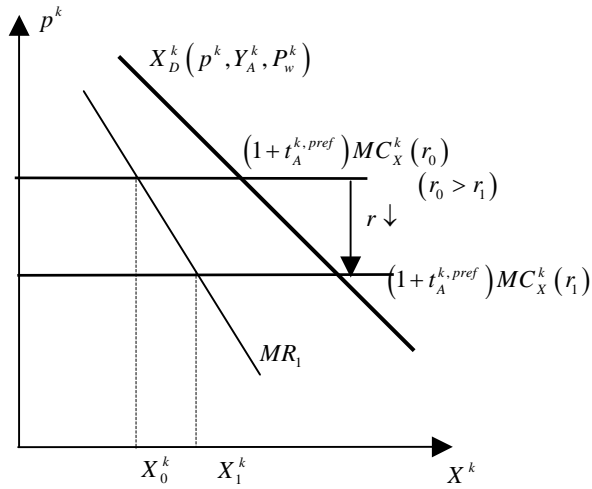
5.a) higher value content requirement

p^k

$X_D^k\left(p^k, Y_A^k, \overline{P^*}\left(1+t_A^{k,MFN}\right)\right)$

$t^{k,MFN}\downarrow$

MR_D

MR_A

$\left(1+t_A^{k,pref}\right)MC_X^k\left(r_0\right)$

$t^{k,MFN}\downarrow$

$X_D^k\left(p^k, Y_A^k, \overline{P^*}\left(1+t_D^{k,MFN}\right)\right)$

$\left(t_D^{k,MFN} < t_A^{k,MFN}\right)$

X_D^k X_A^k X^k
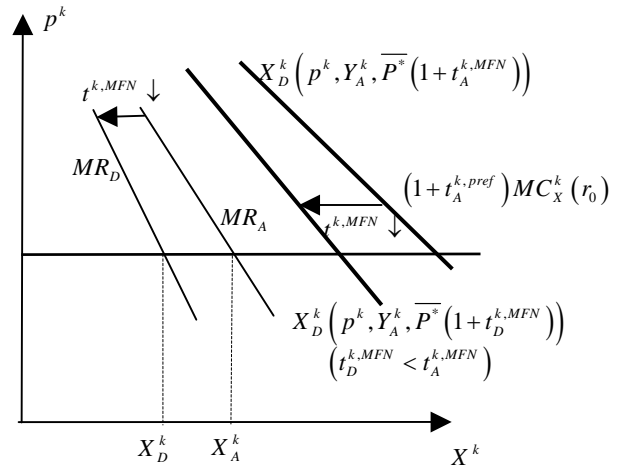
5.b) erosion of preferences due to
    a reduction of the MFN tariff

Figure 5.1

Variety of apparel exported by the 6 largest exporters to the US

(vertical axis: number of tariff lines with positive exports)

Source: Author' calculations on data from WTO Integrated Data Base.

Table 2.1.
Countries benefiting from AGOA's Special Rule (SR) in 2004

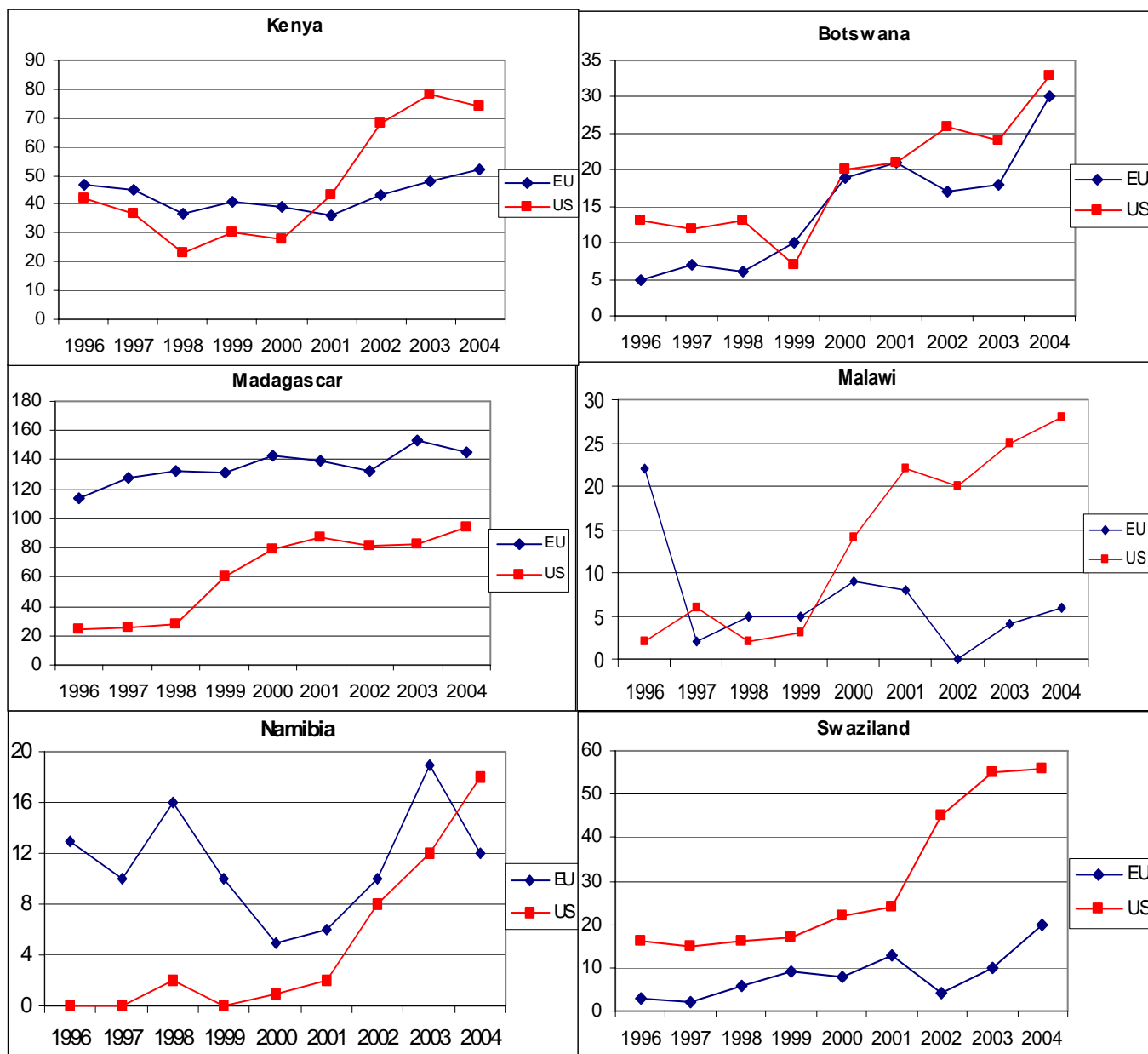|		Exports to the EU in 2004 ['000 USD]		Exports to the US in 2004 ['000 USD]		AGOA Apparel provision date
		[1'000 USD]	share	[1'000 USD]	share	
1	Madagascar	179,732.01	85.77%	323,323	23.34%	Mar-01
2	Lesotho	1,049.13	0.50%	455 935	32.92%	Apr-01
3	Kenya	3,225.09	1.54%	277,173	20.01%	Jan-01
4	Swaziland	1,102.20	0.53%	178,603	12.90%	Jul-01
5	Namibia	97.39	0.05%	78,654	5.68%	Dec-01
6	Botswana	12,596.03	6.01%	20,252	1.46%	Aug-01
7	Malawi	122.66	0.06%	26,775	1.93%	Aug-01
8	Cape Verde	5,097.78	2.43%	3,005	0.22%	Aug-02
9	Ghana	139.43	0.07%	7,368	0.53%	Mar-02
10	Tanzania	3,779.38	1.80%	2,546	0.18%	Feb-02
11	Ethiopia	708.86	0.34%	3,335	0.24%	Aug-01
12	Uganda	4.29	0.00%	4,009	0.29%	Oct-01
13	Mozambique	174.27	0.08%	2,233	0.16%	Feb-02
14	Sierra Leone	787.56	0.38%	1,477	0.11%	Apr-04
15	Cameroon	353.53	0.17%	230	0.02%	Mar-02
16	Senegal	356.48	0.17%	11	0.00%	Apr-02
17	Nigeria	87.12	0.04%	76	0.01%	Jul-04
18	Mali	55.24	0.03%	12	0.00%	Dec-03
19	Niger	58.69	0.03%	6	0.00%	Dec-03
20	Zambia	4.94	0.00%	28	0.00%	Dec-01
21	Benin	18.29	0.01%	2	0.00%	Jan-04
22	Rwanda	4.94	0.00%	1	0.00%	Mar-03
	TOTAL	209,555	100%	1,385,053	100%	

Note : Countries ranked by decreasing order of total apparel exports to the US and to the EU.

Table 4.1
Descriptive statistics

Variable	TOP 7 exporters (reduced sample)			All 22 countries (full sample)		
	Obs	Mean	Std. Dev	Obs	Mean	Std. Dev
$\ln\left(1+X_{i,t}^{j,k}\right)$	13590	3.158	5.203	33408	2.063	4.181
$\ln\left(1+X_{i,t}^{j,k}\right)$	13590	12.66	4.208	33408	12.47	4.097
$\ln\left(1+X_{i,t}^{j,k}\right)$	13590	3.044	6.3	33408	2.958	6.118
$VC_{i,t}^{j,k}$	13590	0.072	0.259	33408	0.083	0.276
$R_{i,t}^{j,k}$	13590	0.2	0.4	33408	0.161	0.368
$\ln\left(Y_t^k\right)$	13590	29.79	0.122	33408	29.79	0.122

Table 4.2 : Average effect of RoO

Dependent variable (Expected sign)	1 coeff	1 marginal effects Uncond.[a]	1 marginal effects Prob. Uncens	2 coeff	2 marginal effects Uncond.[a]	2 marginal effects Prob. Uncens	3 coeff	3 marginal effects Uncond.	3 marginal effects Prob. Uncens
	1a	1b	1c	2a	2b	2c	3a	3b	3c
$R_{i,t}^{j,k}$ (>0)	4.75 [0.56]***	1.39 [0.13]***	0.13 [0.01]***	6.69 [0.78]***	1.6 [0.13]***	0.14 [0.01]***	3.18 [0.39]***	0.67 [0.07]***	0.07 [0.01]***
$VC_{i,t}^{j,k}$ (>0)	1.78 [0.57]***	0.45 [0.13]***	0.05 [0.01]***	0.84 [0.85]	0.15 [0.15]	0.02 [0.02]	2.18 [0.36]***	0.44 [0.06]***	0.05 [0.01]***
$t_{i,t}^{k,mfn}$ (>0)	0.24 [0.04]***	0.06 [0.01]***	0.01 [0.00]***	0.32 [0.05]***	0.05 [0.01]***	0.01 [0.00]***	0.09 [0.03]***	0.02 [0.00]***	0 [0.00]***
$t_{i,t}^{j,k,pref}$ (<0)	-0.25 [0.04]***	-0.06 [0.01]***	-0.01 [0.00]***	-0.19 [0.05]***	-0.03 [0.01]***	0 [0.00]***	-0.15 [0.03]***	-0.03 [0.00]***	0 [0.00]***
$\ln\left(Y_t^k\right)$ (>0)	13.43 [2.79]***	3.09 [0.64]***	0.33 [0.07]***	13.85 [4.07]***	2.37 [0.70]***	0.25 [0.07]***	13.57 [1.93]***	2.38 [0.34]***	0.28 [0.04]***
$D_i^{Madag-02}$ (<0)	-1.67 [0.73]**	-0.35 [0.17]**	-0.04 [0.02]**				-1.13 [0.73]	-0.19 [0.13]	-0.02 [0.02]
Observations	13590			9810			33408		
Pseudo-R$^{2\,b)}$	0.238			0.166			0.184		
Likelihood ratio$^{c)}$	2490.54 (0)			1060.26 (0)			4149.17 (0)		
Sample	Top 7			Top 7 exc. Madag.			all 22 AGOA-SR .		
Country-pair dummies	Yes			Yes			Yes		
$e^{\left(Uncond.R_{i,t}^{j,k}\right)}-1$	3.03			3.96			0.96		

Note:
a) Unconditional marginal effects are evaluated at the sample mean-value for t=1999
b) McKelvey and Zavoina's pseudo-R².
c) The reported likelihood ratio follows a chi-squared distribution with a number of degrees of freedom equal to the number of independent variables. The p-value of this statistic is reported in brackets

Estimates include a constant that is not reported here.
Standard errors in brackets.   *significant at 10%; ** significant at 5%; * significant at 1%.**

Table 4.3 :
Temporal effects of RoO

	4			5		
	coeff	marginal effects		coeff	marginal effects	
		Uncond.[a]	$e^{(Uncond.R)}-1$		Uncond.[a]	$e^{(Uncond.R)}-1$
	4a	4b	4c	5a	5b	5c
$R_{i,t}^{j,k}$	3.24 [0.70]***	0.88 [0.16]***	1.41	4.3 [0.96]***	0.91 [0.16]***	1.48
$R2_{i,t}^{j,k}$	1.91 [0.78]**	0.48 [0.18]***	0.62	2.78 [1.03]***	0.54 [0.17]***	0.72
$R3_{i,t}^{j,k}$	0.75 [0.77]	0.18 [0.18]	0.20	1.9 [1.00]*	0.35 [0.17]**	0.42
$R4_{i,t}^{j,k}$	-0.02 [0.84]	0 [0.19]	0	0.18 [1.26]	0.03 [0.21]	0.03
$VC_{i,t}^{j,k}$	1.99 [0.57]***	0.51 [0.13]***		1.27 [0.85]	0.23 [0.14]	
$t_{i,t}^{k,mfn}$	0.25 [0.04]***	0.06 [0.01]***		0.33 [0.05]***	0.06 [0.01]***	
$t_{i,t}^{j,k,pref}$	-0.27 [0.04]***	-0.06 [0.01]***		-0.22 [0.05]***	-0.04 [0.01]***	
$\ln\left(Y_t^k\right)$	10.26 [2.97]***	2.35 [0.68]***		7.26 [4.30]*	1.23 [0.73]*	
$D_i^{Madag-02}$	-1.71 [0.77]**	-0.36 [0.18]**				
Observations	13590			9810		
Pseudo R$^{2\ b)}$	0.24			0.17		
Likelihood ratio[c]	2505.18 (0)			1083.42 (0)		
Sample	Top 7			Top 7 exc. Madag.		
Country-pair dummies	Yes			Yes		

Note:
a)   Unconditional marginal effects are evaluated at the sample mean-value for t=1999
b) McKelvey and Zavoina's pseudo-R².
c)   The reported likelihood ratio follows a chi-squared distribution with a number of degrees of freedom equal to the number of independent variables. The p-value of this statistic is reported in brackets.

Estimates include a constant that is not reported here.
Standard errors in brackets.   *significant at 10%; ** significant at 5%; * significant at 1%.**

Table 4.4 :
Estimation results: RoO effects by exporters

	6			7		
	coeff	marginal effects		coeff	marginal effects	
		Uncond.	$e^{(Uncnd)}-1$		Uncond.	$e^{(Uncnd)}-1$
	6a	6b	6c	7a	7b	7c
$D_i^{Bot} \times R_{i,t}^{j,k}$	2.52 [1.29]*	0.55 [a)] [0.24]**	0.73	3.67 [1.52]**	0.83 [0.28]***	1.29
$D_i^{Ken} \times R_{i,t}^{j,k}$	3.15 [0.86]***	0.98 [a)] [0.23]***	1.66	4.47 [1.04]***	1.41 [0.27]***	3.10
$D_i^{Les} \times R_{i,t}^{j,k}$	5.89 [0.94]***	1.54 [a)] [0.18]***	3.66	7.32 [1.13]***	1.95 [0.21]***	6.03
$D_i^{Mad} \times R_{i,t}^{j,k}$	3.94 [0.84]***	1.86 [a)] [0.34]***	5.42			
$D_i^{Mala} \times R_{i,t}^{j,k}$	9.9 [1.59]***	3.6 [a)] [0.36]***	7.94	12.08 [1.87]***	2.76 [0.22]***	14.80
$D_i^{Nam} \times R_{i,t}^{j,k}$	15.41 [2.42]***	6.92 [a)] [0.54]***	14.03	18.06 [2.82]***	3.3 [0.15]***	26.11
$D_i^{Swa} \times R_{i,t}^{j,k}$	6.41 [1.13]***	1.3 [a)] [0.15]***	2.67	8.2 [1.35]***	1.72 [0.18]***	4.58
$VC_{i,t}^{j,k}$	1.78 [0.57]***	0.44 [b)] [0.13]***	0.55			
Observations	13590			9810		
Pseudo R^{2} [b)]	0.24			0.19		
Likelihood ratio[c)]	2495.17 (0)			1067.32 (0)		
Sample	Top 7			Top 7 excl. Madag.		
Country-pair dummies	Yes			Yes		

Notes:
a) Unconditional marginal effects are evaluated at the country mean-value for t=1999
b) McKelvey and Zavoina's pseudo-R².
c) The reported likelihood ratio follows a chi-squared distribution with a number of degrees of freedom equal to the number of independent variables. The p-value of this statistic is reported in brackets.

Estimates include constants and other dependent variables that are not reported in this table. Standard errors in brackets.   *significant at 10%; ** significant at 5%; * significant at 1%**

<p style="text-align:center">Appendices to</p>

<p style="text-align:center">The Costs of Rules of Origin in Apparel:</p>

<p style="text-align:center">African preferential exports to the US and to the EU</p>

<p style="text-align:center">by Alberto Portugal-Perez</p>

<p style="text-align:center">(not submitted for publication)</p>

Appendix 1
Derivation of expression (1.5)

Profit- maximizing pricing for sellers of African apparel implies:

$$p^k\left(X^k,Y^k,P_w^k\right)+\frac{\partial p^k\left(X^k,Y^k,P_w^k\right)}{\partial X^k}\ X^k=\left(1+t^{k,pref}\right)\ \left(MC_X^k\right) \tag{1.4}$$

where $p^k(\ )$ is the inverse demand function of country k and $P_w^k=\overline{P^*}\left(1+t^{k,MFN}\right)$.

Totally differentiating expression (1.4), we obtain:

$$\left\{\frac{\partial^2 p^k(\ )}{\partial\left(X^k\right)^2}X^k+2\frac{\partial p^k(\ )}{\partial X^k}-\left(1+t^{k,pref}\right)\frac{\partial MC_X^k(\ )}{\partial X^k}\right\}dX^k+\left\{\frac{\partial^2 p^k(\ )}{\partial X^k\partial Y^k}X^k+\frac{\partial p^k(\ )}{\partial Y^k}\right\}dY^k+$$

$$-\left\{MC_X^k(\ )\right\}dt^{k,pref}-\left\{\left(1+t^{k,pref}\right)\frac{\partial MC_X^k(\ )}{\partial r}\right\}dr+\left\{\frac{\partial^2 p^k(\ )}{\partial X^k\partial P_w^k}\overline{P^*}X^k+\frac{\partial p^k(\ )}{\partial P_w^k}\overline{P^*}\right\}dt^{k,MFN}=0$$

Since we assumed: $\dfrac{\partial MC_X^k(\ )}{\partial X^k}=0$, we have :

$$A\times dX^k+B\times dY^k+C\times dt^{k,pref}+D\times dr+E\times dt^{k,MFN}=0 \tag{A1}$$

Where: $A=\dfrac{\partial^2 p^k(\ )}{\partial\left(X^k\right)^2}X^k+2\dfrac{\partial p^k(\ )}{\partial X^k}$, $B=\dfrac{\partial^2 p^k(\ )}{\partial X^k\partial Y^k}X^k+\dfrac{\partial p^k(\ )}{\partial Y^k}$, $C=-MC_X^k(\ )$;

$D=-\left(1+t^{k,pref}\right)\dfrac{\partial MC_X^k(\ )}{\partial r}$, and $E=\dfrac{\partial^2 p^k(\ )}{\partial X^k\partial P_w^k}\overline{P^*}X^k+\dfrac{\partial p^k(\ )}{\partial P_w^k}\overline{P^*}$.

Then from (A1) :

$A>0$ if and only if $-\dfrac{\partial^2 p^k(\ )}{\partial\left(X^k\right)^2}X^k>2\dfrac{\partial p^k(\ )}{\partial X^k}$, which is verified, for instance, if we

assume a linear demand function , so that $\dfrac{\partial^2 p^k(\ )}{\partial\left(X^k\right)^2}=0$.

$B>0$ if and only if $\dfrac{\partial^2 p^k(\ )}{\partial X^k\partial Y^k}X^k>\dfrac{\partial p^k(\ )}{\partial Y^k}$, which is verified, for instance , when we

assume that $\dfrac{\partial^2 p^k(\ )}{\partial X^k \partial Y^k} > 0.$

$C < 0$ and $D < 0$.

$E > 0$ if and only if $\dfrac{\partial^2 p^k(\ )}{\partial X^k \partial P_w^k} X^k > \dfrac{\partial p^k(\ )}{\partial P_w^k}$, which is verified, for instance, when

we assume that $\dfrac{\partial^2 p^k(\ )}{\partial X^k \partial P_w^k} > 0.$

Then,
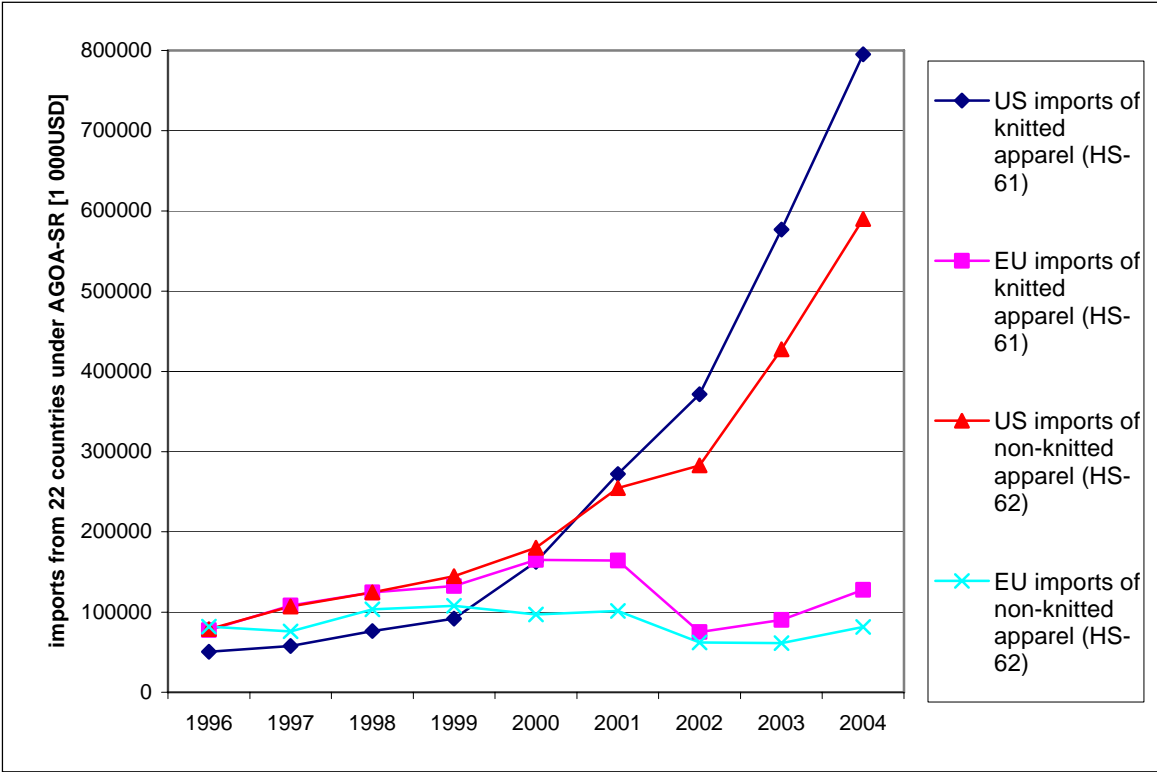
$$\frac{dX^k}{dY^k} = -\frac{B}{A} > 0, \frac{dX^k}{dt^{k,pref}} = \frac{C}{A} < 0, \frac{dX^{EU}}{dr} = \frac{D}{A} < 0 \text{ and } \frac{dX^k}{dt^{k,MFN}} = -\frac{E}{A} > 0$$
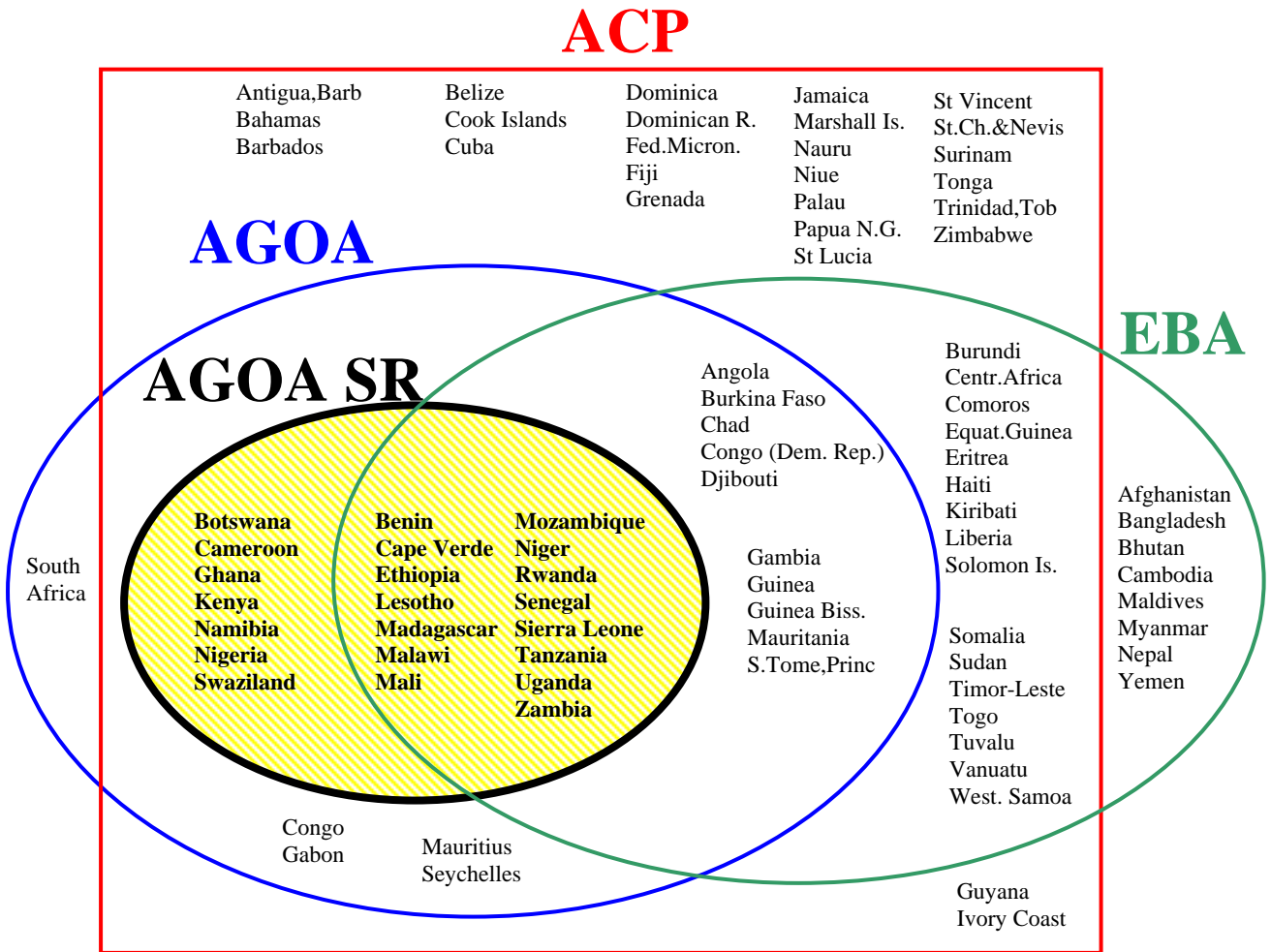
Figure A2.1

EU and US Imports of knitted (HS-61) and non-knitted (HS-62) apparel

Source: Author's calculations on data from WTO Integrated Data Base.

Figure A2.2

A map of AGOA, ACP and EBA in 2004

ACP

Antigua,Barb
Bahamas
Barbados

Belize
Cook Islands
Cuba

Dominica
Dominican R.
Fed.Micron.
Fiji
Grenada

Jamaica
Marshall Is.
Nauru
Niue
Palau
Papua N.G.
St Lucia

St Vincent
St.Ch.&Nevis
Surinam
Tonga
Trinidad,Tob
Zimbabwe

AGOA

EBA

AGOA SR

Angola
Burkina Faso
Chad
Congo (Dem. Rep.)
Djibouti

Burundi
Centr.Africa
Comoros
Equat.Guinea
Eritrea
Haiti
Kiribati
Liberia
Solomon Is.

South
Africa

Botswana
Cameroon
Ghana
Kenya
Namibia
Nigeria
Swaziland

Benin
Cape Verde
Ethiopia
Lesotho
Madagascar
Malawi
Mali

Mozambique
Niger
Rwanda
Senegal
Sierra Leone
Tanzania
Uganda
Zambia

Gambia
Guinea
Guinea Biss.
Mauritania
S.Tome,Princ

Afghanistan
Bangladesh
Bhutan
Cambodia
Maldives
Myanmar
Nepal
Yemen

Somalia
Sudan
Timor-Leste
Togo
Tuvalu
Vanuatu
West. Samoa

Congo
Gabon

Mauritius
Seychelles

Guyana
Ivory Coast

Note:
Mauritius was designated to benefit from AGOA SR in December 2004.

Appendix 3. Rules of Origin for T&A under some FTAs in a nutshell

PTA	Rules of Origin	Legal texts
NAFTA	▪ Rules of origin for T&A are very complex. In order to be eligible for preferential access under NAFTA, most textiles and apparel must be produced, i. e. cut and sewn, in the NAFTA area from yarn also made in a NAFTA country. This is called <u>the triple transformation process.</u> ▪ In the case of cotton and man-made fibre spun yarn, the fibre must originate from North America, i.e. the NAFTA area.	The NAFTA agreement can be found at: http://www.nafta-sec-alena.org/DefaultSite/index_e.aspx?DetailID=78 Rules applying to trade in textiles and apparel goods between NAFTA countries are set out in annex 300-B. All specific rules of origin are detailed in annex 401.
AGOA general regime	▪ AGOA provides quota-free and duty-free treatment to apparel assembled (and/or cut) in one or more beneficiary SSA country from US fabrics, which in turn are made out of US yarn. Apparel articles assembled from fabric formed in beneficiary SSA countries from US yarn or originating in one or more beneficiary sub-Saharan African countries are allowed only in an amount not to exceed an applicable percentage[25] (sec 112). ▪ AGOA allows for diagonal cumulation with respect to other SSA beneficiary countries (sec 112) ▪ Apparel imports made with regional (African) fabric and yarn are subject to a cap of 1.5% of the aggregate square meter equivalents of all apparel articles imported into the US in the preceding 12-month period (section 111), growing proportionally to 3.5% of overall imports over an 8 year period. The amendments to AGOA signed in 2002 (AGOA II) double the applicable percentages of the cap. ▪ The AGOA Acceleration Act (AGOA III), signed in 2004, increases the De Minimis Rule from its current level of 7 percent to 10 percent. This rule states that apparel products assembled in Sub-Saharan Africa which would otherwise be considered eligible for AGOA benefits but for the presence of some fibbers or yarns not wholly formed in the United States or the beneficiary Sub-Saharan African country will still be eligible for benefits as long as the total weight of all such fibbers and yarns is not more than a certain percent of the total weight of the article.	The African Growth and Opportunity Act (AGOA) was signed into law on May 18, 2000 as Title 1 of The Trade and Development Act of 2000. President Bush signed amendments to AGOA (a.k.a. AGOA II) on August 6, 2002 as Sec. 3108 of the Trade Act of 2002. Finally, the AGOA Acceleration Act (AGOA III) was signed by the US President on July 12, 2004. The above mentioned legal texts are integrally downloadable at the website: http://www.agoa.gov/agoa_legislation/agoa_legislation.html
AGOA's special regime for	▪ AGOA grants special ROO to "lesser developed countries". These countries are allowed to use third country fabric and yarn and still qualify for AGOA preferences. In other words, making up fabric into clothing, or -<u>simple transformation process</u>- is sufficient to confer origin.	Sec 112 of the8 AGOA legal text

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[25] Initially, the applicable percentage is equal to 1.5 percent for the 1-year period beginning October 1, 2000, increased in each of the seven succeeding 1-year periods by equal increments, so that for the period beginning October 1, 2007, the applicable percentage does not exceed 3.5 percent. See Then this applicable percentage has been "doubled" by AGOA II.

Lesser Developed Countries	▪ The special regime for LDCs expires on September 30, 2007 but can be renewed by Congress, as has been previously done.	
EU's GSP/EBA and Cotonu (ACP) Agreements	▪ EU rules of origin for apparel require production from yarn. This entails that a <u>double transformation process</u> must take place in the beneficiary country with the yarn being woven into fabric and then the fabric cut and made-up into clothing. ▪ Product specific rules of origin (PSRO) for textiles and apparel under EBA and Cotonou (ACP) are the same. ▪ There are differences in the cumulation schemes between the EBA or GSP and those of the Coutonou Agreement. Under the Cotonou Agreement, there is full cumulation among African countries, so that regional fabrics can be used without losing originating status. Under the GSP there is more limited partial or diagonal cumulation that can only take place within four regional groupings: ASEAN, CACM, the Andean Community and SAARC but not amongst ACP countries[26]. Therefore, LDC countries members to ACP who are also eligible to export to the EU under the EBA may, and often do, prefer to continue exporting under ACP, in part, due to the more liberal RoO existing under the latter. ▪ The ACP agreement attaches extensive conditions to cumulation with non-ACP countries as well as South Africa (see Annexes IX-XI to Protocol 1 of the ACP agreement). However, diagonal cumulation under GSP is constrained by the requirement that the value-added in the final stage of production exceeds the highest customs value of any of the inputs used from countries in the regional grouping (art 72a).	The Everything but Arms (EBA) Agreement has been incorporated as amendment to the EU- GSP system as Regulation EC 416/2001 and was signed on 28 February 2001 and can be found at http://trade.ec.europa.eu/docli b/docs/2004/october/tradoc_1 11459.pdf ROO under the EU- GSP schemes are defined by Articles 66 to 97 and Annexes 14 to 18 and 21 of Regulation (EEC) No. 2454/93[27], as amended by Regulations Nos. 12/97, 1602/2000 and 881/2003 . The ACP partnership Agreement was signed in Cotonou on 23 june 2000 and the text can be found at http://eur-lex.europa.eu/LexUriServ/site/e n/oj/2000/l_317/l_3172000121 5en00030286.pdf RoO under the ACP agreement are detailed in Protocol 1 of the ACP Agreement: "Concerning the definition of the concept of origination products and methods of administrative cooperation", as well as its annexes.

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[26] Bilateral GSP cumulation applies between the EC and the beneficiary country, diagonal cumulation applies between the EC, Norway and Switzerland and the beneficiary country and regional cumulation applies between the beneficiary country belonging to one of the three GSP regional cumulation groups (Group I (Brunei-Darussalam, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Vietnam), Group II (Bolivia, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Peru, Venezuela), and Group III (Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka)). These types of cumulation may be combined for a single operation. Source:
http://ec.europa.eu/taxation_customs/customs/customs_duties/rules_origin/preferential/article_779_en.htm
[27] http://europa.eu.int/eur-lex/en/consleg/pdf/1993/en_1993R2454_do_001.pdf