Does the African Growth and Opportunity Act (AGOA) impact EU-15 imports from Africa?

Abstract

At the heart of the African Growth and Opportunity Act (AGOA) are substantial trade preferences which, coupled with the Generalised System of Preferences (GSP), grant a wide range of goods produced in qualified African countries duty-free access to USA. To be AGOA-eligible, countries are assessed annually on their progress in undertaking appropriate economic, institutional and human rights reforms. Our paper seeks to cover new grounds by exploring whether exports of apparel to US crowds out EU-15's imports from Africa over the period 2001-2016. Two-stage least squares estimates of our gravity model provide no evidence of trade displacement but, instead, provide support for the hypothesis of complementarity of African exports to the two key markets. A stronger positive impact of bilateral trade between US and Africa on EU-African trade is evident mainly before the phasing out of the Agreement on Textiles and Clothing. We examine whether the more relaxed special waiver embodied in AGOA's apparel provision cause Non-Knitted exports to EU-15 to be crowded out. We find that Special Rule beneficiaries' exports to the two markets still complement each other, but for every percentage increase in exports to USA, there is a less than proportionate increase in exports to EU-15, indicating a higher utilisation of the special waiver. We also find some evidence of complementary apparel exports to both LDCs (least developing countries) and non-LDCs, with stronger effects for non-LCDs and in non-knitted sector.

1. Introduction

The African Growth and Opportunity Act (AGOA) was introduced by the United States in the year 2000 with the objectives of expanding and deepening trade and investment relationship with Sub-Saharan Africa (SSA), encouraging economic growth and development and facilitating the continent's integration into the global economy. At the heart of AGOA are substantial trade preferences, which coupled with the Generalised System of Preferences (GSP), grant a wide range of goods produced in qualified countries duty-free access to the US. To be AGOA-eligible, countries are assessed on an annual basis on their progress in meeting a set of specific criteria including establishment of market-based economy and rule of law, strengthening of the private sector, reforms to alleviate

poverty and combat corruption, better access to health services and education recognition of core labour standards and elimination of barriers to US trade and investment.

Most of these eligibility requirements encourage SSA countries to undertake appropriate economic, institutional and human rights reforms that in turn reduce behind-the-border barriers to trade. The need for enhanced behind-the-border trade facilitating and growth enhancing amenities, such as improved 'hard infrastructure' (highways, railways, ports, etc) and 'soft infrastructure' (better institutions, higher transparency, more competition, stronger governance, etc) as a means to facilitate economic growth and development is well documented in literature (see for example, Limão and Venables, 1999; Francois and Manchin, 2006; Portugal-Perez and Wilson, 2008; Iwanow and Kirkpatrick, 2009).

The apparel sector has been identified as one of the three non-crude petroleum sectors benefitting most from the legislation, along with transportation equipment and refined petroleum products (USITC, 2014). In first three years since AGOA's inception, the value of US imports of apparel rose sharply but later dropped to a lower level. Over the 2001-2016 period, however, the value of US apparel imports remained higher than EU-15's imports from the same group of countries. The extent of preferential access, measured by the average most-favoured-nation tariff, to the US market under AGOA does not differ greatly from that granted by the EU's preferential regimes under the Cotonou agreement and EBA, but there is a significant divergence on rules of origin (Portugal-Perez, 2008). While the EU's rules 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 country, AGOA's Special Rule allows lesser developed countries to use fabric originating from anywhere in the world, hence allowing these countries to take advantage of cheaper sources.

While the impacts of AGOA on US imports from Sub-Saharan Africa have received a lot of attention in the literature, few studies have examined whether an increase in African exports to the US affects similar exports to other key markets such as EU-15 offering similar preferences. This paper adds to the discussion of trade redirection from EU-15 to US due to AGOA. We re-examine Frazer and Van Biesebroeck's (2010) proposition that the increased apparel exports to the US under AGOA could be a result of redirection of exports from other markets using data over a much longer span of 2001-2016 (as opposed

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to 1999-2000 and 2002-2003) in a gravity model setting. We also investigate whether the impact differs before and after the phasing out of the Agreement on Textile and Clothing (ATC) as well as in the knitted and non-knitted sub-sectors. One could argue that as AGOA apparel exporters face stiffer competition from more efficient Asian exporters, they would further utilise preferences granted by AGOA and concentrate on the US market, leading to displacement of exports to the EU. Moreover, given that there are substantial differences in the apparel rules of origin, we hypothesize that African countries may prefer to export to the US at the expense of EU as AGOA offers more relaxed rules of origins (RoOs), especially in the non-knitted sector.

The displacement or complementary effect uncovered by the analysis would yield interesting insights on the success of the clothing provision of the Act. If bilateral trade from Africa is redirected from EU-15 to US, this would imply that African apparel exporters find AGOA's market access provisions, including its more relaxed rules of origins, to be more beneficial. This would provide the much anticipated support and credibility to the clothing program, seen as a centrepiece of the legislation at the time of implementation. AGOA intentionally targeted the highly labour-intensive apparel sector for special benefits with a view to not only foster employment creation opportunities in all beneficiary countries, but also to give Africa another chance to lift its apparel exports to threshold productivity levels and carve a niche amidst an increasingly competitive global trading environment. Apparel production is considered as a manufacturing sector with low technological and investment barriers to entry, requiring relatively low skilled labour forces, hence relevant to many African nations (Williams, 2015).

On the other hand, if there is complementarity between EU-15 and US apparel imports, this would imply that African exporters still see EU-15 as a natural market and that AGOA preferences were not being fully utilised by all beneficiaries to cause an offsetting effect, thus undermining one of the key intentions of the act. From the US importers' perspective, tariff margins offered by AGOA would not provide enough incentives to influence apparel sourcing decisions away from more competitive suppliers from around the world. International competitiveness requires, among other things, modern business practices, good infrastructure and trade logistics. Earlier studies have linked poor export performance in the region to inadequate infrastructure (Limão and Venables, 2001), low levels of per capita income, small country size, geography (Rodrik, 1998), domestic trade policies

(Wang and Winters, 1998) and transport costs and other natural barriers (Morrissey, 2005). These could still represent major impediments to trade in many African nations.

The paper is organised as follows: Section 2 presents a descriptive overview of US and EU preferential trading schemes with Africa. Section 3 then reviews the literature. Model specification and data sources are outlined in Section 4. Estimation results and discussion are provided in Section 5. Section 6 concludes.

2. US and EU Trading Arrangements with Africa

2.1. US-Africa Trade Relation

The centrepiece of US trade policy for Africa is the African Growth and Opportunity Act (AGOA), a non-reciprocal trade agreement signed on May 18, 2000 by US Congress. Initially designed to cover an 8-year period, the program was extended to 2015 in the AGOA Acceleration Act of 2004 (AGOA III). On June 29, 2015, the Trade Preferences Extension Act renewed the program for a further 10 years. The legislation also includes a mandate for US and African government officials to meet and discuss economic issues including US development assistance to Africa through the AGOA forum.

AGOA eligibility is not an automatic process. Country eligibility is reviewed annually by the US President, who grants beneficiary status to an African nation if it is committed to: developing market-based economies; political and legal institutions; removing barriers to US trade and investment; improving intellectual property rights; fighting corruption; reducing poverty; protecting human and worker rights, and eradicating child labour (AGOA 2000).

AGOA allows eligible African nations to export non-apparel and apparel products to the US without incurring a tariff charge. It expands the US Generalized System of Preferences (GSP) list of approximately 4,600 non-apparel products (such as watches, footwear, handbags, luggage and work gloves to name a few) adding 1,800 other items; representing additional markets to which only AGOA-eligible countries have access. African countries must be eligible for GSP to become AGOA beneficiaries. As a result, AGOA countries can export about 6,400 items without duty restrictions to the United States.

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Apparel articles, generally excluded from the US GSP[1], are exempt from US import tariff under AGOA. This trade preference is, however, not automatic as soon as AGOA eligibility is granted. To qualify for the Apparel provision, countries must have in place (i) an effective apparel visa system to prevent illegal shipment and use of counterfeit documentation and (ii) appropriate enforcement and verification procedures. The provision's product specific rules of origin (PSRO)[2] were designed in line with the triple-transformation process (cotton to yarn to textile to apparel) prevailing under other US trade concessions programmes such as North American Free Trade Agreement (NAFTA) and Caribbean Basin Initiative (CBI) (Portugal-Perez, 2008). Apparel has to be assembled in one or more AGOA eligible country from US fabrics (or African-country fabrics up to a specified percentage), which in turn were made from US yarn[3]. Apparels made in AGOA eligible countries from US fabric and yarn have duty-free and quota-free access to the US market without limitations. Apparels made with domestically produced fabric or that produced in other AGOA beneficiary countries also qualify for concessionary treatment but are subject to a quantitative restriction[4].

The Apparel provision also embodies a 'Special Rule' (or 'third country fabric rule of origin') designed for least developed AGOA beneficiaries. AGOA designates least developing countries (LDCs) as countries with a GNP per capita below $1,500 in 1998 as defined by the World Bank (ITA, 2019). It is interesting to note that there is greater latitude in determining LDC status under the US GSP scheme than under AGOA (Williams, 2015 p.6). While GSP defines LDCs as per to the United Nations' designation based on three criteria[5] namely, Gross National Income per capita of $1,025, Human Assets Index of 60 (lower index indicates lower human capital) and Economic Vulnerability Index of 36

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[1] The US GSP allows duty free access to some handicraft items certified for being hand-loomed and of folklore nature under the 'Certified Textile Handicraft Agreements' signed by the United States and fifteen beneficiary countries (United States Trade Representative, These items are not part of the HS61 (knitted apparel) and HS 62 (non-knitted apparel) considered in this paper

[2] These elaborate sets of rules, designed primarily to prevent trade deflection, apply in a "non-homogeneous" manner across product categories. Rules of origins are guidelines for establishing the origin or 'economic nationality' of the goods and not just the country they have been shipped from but also the place where they are deemed to have been produced. This ensures that concessionary access given to a particular market benefits the intended recipient and not third parties.

[3] Under the "De Minimis Rule", apparel containing fibres or yarns not wholly formed in the US or other AGOA beneficiaries retain duty free benefits provided the weight of such inputs do not exceed 10% of the total weight (AGOA, https://agoa.info).

[4] AGOA restricts imports of apparel made with regional fabric to a fixed percentage of the aggregate square meter equivalents of all apparel articles imported into the US. Starting October 1, 2007, the annual aggregate quantity of imports under these provisions was an amount not to exceed 7% of all apparel imported into the US. Any excess imports over this amount are subject to applicable tariffs. In addition, the duty-free cap is not allocated among countries but works on a "first come, first serve" principle (OTEXA, 2017). Moreover, the value of any foreign-sourced interlinings, findings and trimmings should not exceed 25 per cent of the cost of the components of the assembled apparel article.

5 See U.N Economic Analysis & Policy Division, LDC Identification Criteria and Indicators (https://www.un.org/development/desa/dpad/least-developed-country-category/ldc-criteria.html)

(higher index indicates higher vulnerability), US officials are also authorised to assess compliance with GSP statutory requirements and comments from the public (CRS Report, 2019).

The Special Rule relaxes the apparel provision's rules of origin by allowing the least developed AGOA beneficiaries to manufacture with fabrics and yarns originating from anywhere in the world without incurring a tariff charge. In effect, this special provision allows for a single transformation requirement (fabric to apparel) instead of the more rigorous triple transformation. Despite having a level of GNP per capita exceeding the threshold of $1,500 GNP per capita, Botswana, Namibia and Mauritius have been granted LDC status. South Africa is the only country that does not qualify for the special waiver. Since its inception in 2001, the Special Rule has been renewed four times[6] and remains in effect until September 2025.

2.2 EU-Africa Preferential Trading Schemes

Since 1975, African countries have enjoyed unilateral preferential access to the EU market under Lomé Convention and its successive rounds. Deemed as a breach of the WTO 'most-favoured nation' principle, the convention was replaced by the Cotonou Agreement in 2000. This marked the beginning of a reciprocal but asymmetric market access, where the EU provides full duty free market access to ACP countries that ratify Economic Partnership Agreements (EPAs) and the latter commit to progressively open their markets to EU. To assist the integration of least developed countries into the global economy, EU launched the "Everything but Arms" (EBA) initiative in 2001 as an extension of its GSP scheme to meet the needs of least developed countries worldwide and granted full duty free and quota-free access to the EU for all their exports with the exception of arms and armaments.

Product specific rules of origin (PSRO) for textile and apparel under EBA and Cotonou agreement follow those postulated by EU's "single list" (Portugal-Perez, 2008). The "Single List", implemented since July 2000, harmonised rules of origin under various trading agreements, and extended the double transformation process to all apparel lines under chapter 61 and 62 of the Harmonised system. For textile and apparel, the rules of
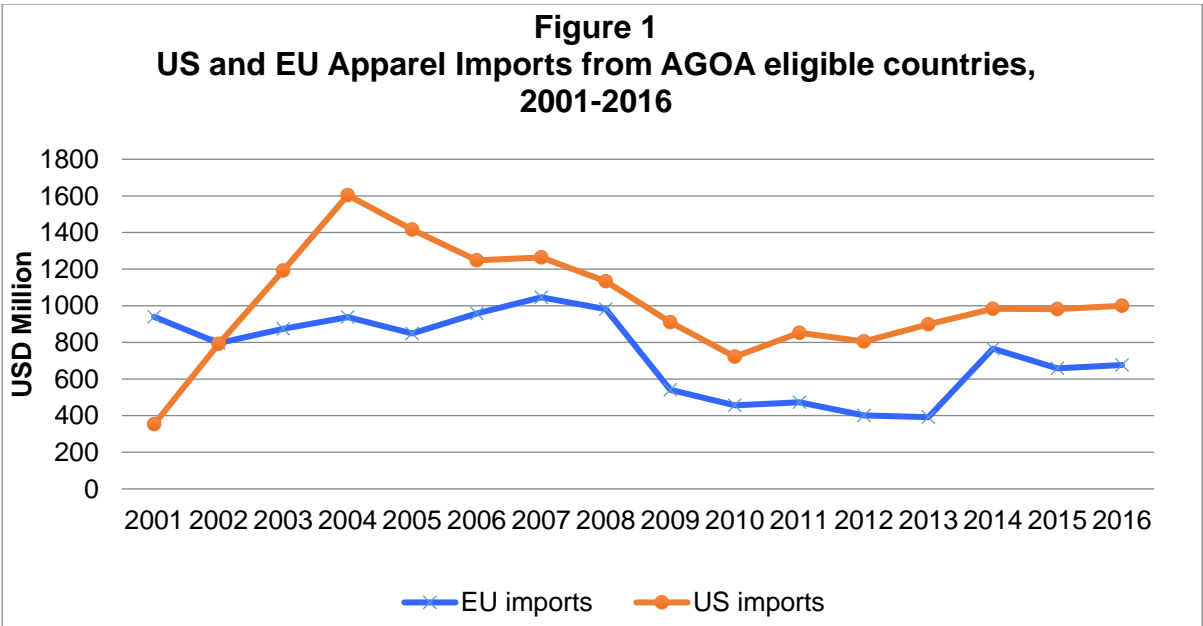
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6 The special rule was extended in 2004 for three years, in 2007 for another five years, in 2012 for a further three years and in 2015 for ten years. A list of AGOA beneficiaries and countries eligible for the Apparel Provision and Special Rule can be found on the International Trade Administration (ITA), US Department of Commerce website (https://www.trade.gov/agoa/eligibility/index.asp).
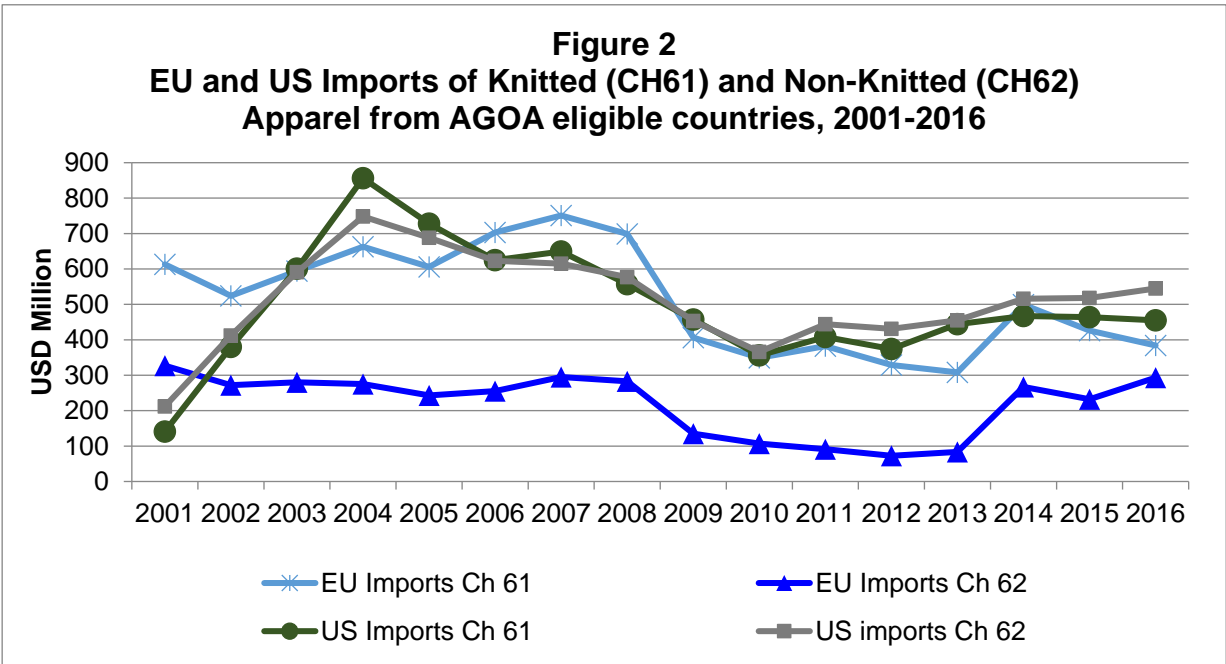
origin required that apparel be manufactured from yarn wholly produced in the exporter country. Production from yarn entails a double transformation process in the beneficiary country, with the yarn being woven into fabric and fabric cut and made into clothing (yarn to fabric to apparel). The EBA initiative imposes a further burden on African countries in that the cumulation provision is 'bilateral'[7] (EU and beneficiary country). In other words, fabrics cannot be sourced from countries in the region to manufacture clothing and only fabrics made in the exporting country or the EU are acceptable. Cotonou agreement allows full cumulation among African countries so that regional fabrics can be used without compromising origin requirements. It also attached extensive conditions to potential cumulation with non-ACP countries, including South Africa.

2.3 AGOA Countries' Apparel Exports to US and EU-15

US total imports under AGOA are heavily concentrated in crude petroleum, which account for a share of roughly 90%. Imports other than crude petroleum include agriculture, manufactured goods (including electronics, machinery, transportation equipment, chemicals and miscellaneous manufacturing), natural resources (non-crude petroleum energy, minerals and metals) and textiles and apparels (USITC, 2014). Apparel was the main non-petroleum product category imported under AGOA in the early years of the program, but has since faltered in rank and value.

Figure 1
US and EU Apparel Imports from AGOA eligible countries, 2001-2016

Figure 2
EU and US Imports of Knitted (CH61) and Non-Knitted (CH62) Apparel from AGOA eligible countries, 2001-2016

As shown in Figure 1, exports in this category increased sharply in the first three years of AGOA's launch, growing by 70% on average. Since 2005, which also marks the termination of the Agreement on Textiles and Clothing, US imports of apparel from the region dwindled, posting an average growth of -3.4% to 2016. The value of EU-15 apparel imports from the same group countries, on the other hand, stayed relatively flat until 2008, declined during the recession and picked up again in 2013. A similar pattern is observed with US imports post 2008. Overall, however, the value of US imports of apparel remained higher than EU-15 imports since AGOA's inception.

A more disaggregated view of the apparel sector shows that US imports of knitted and non-knitted apparel articles from Africa bear a very close resemblance (Figure 2). This contrasts remarkably with EU-15, which appears to source more Knitted apparel (CH61) from Africa than Non-Knitted items.

3. Literature review

EU's non-reciprocal trade preferences not only aim at boosting export volumes for developing countries but also facilitating export diversification. Gjodesen-Lund and Van Biesebroeck (2015) note that EU's GSP preferences and EBA program have strong positive impacts on developing countries' exports, especially LDCs. Similarly, Cirera et. al. (2016) observe that unilateral preferences have been successful at boosting exports to the EU through both lower tariffs and positive preference margin. However, views on export diversification are less promising when African countries are considered. Persson

and Wilhelmsson (2016) for instance observe that although EU GSP increased the ranges of export products for developing countries, African, Caribbean and Pacific (ACP) preferences granted during 1989–2007 (Lomé IV-Cotonou) may have caused more specialization than diversification. In fact, the proportion of manufactured goods exported by African LDCs to their main partners, including the EU, is marginal and showed no improvement over 2000–12. Fuels and to a lesser extent ores and metals, made up most of these exports.

Considering that the intent of AGOA is to enhance Africa's integration into the global economy by encouraging trade and investment, generate employment and increase productivity and per capita income growth, its impact on beneficiaries' exports to the US has generated a lot interest among researchers. To this end, various approaches have been used including computable general equilibrium models (Bouët et al., 2010), partial equilibrium models (Mattoo et al., 2003; Shapouri and Trueblood, 2003; Laborde, 2008), analysis of raw trade data and AGOA provisions (Shapouri and Trueblood, 2003; Brenton and Ikezuki, 2004; Brenton and Hoppe, 2006; Office of US Trade Representative, 2008), country case studies (Lall, 2005; Rolfe and Woodward, 2005; Phelps et al., 2009), gravity model (Nouve and Staatz, 2003; Nouve, 2005; Seyoum, 2007; Tadesse and Fayissa, 2008; Mueller, 2008; Didia et al., 2015), regression models (Collier and Venables, 2007; Cook and Jones, 2015) and triple difference-in-differences models (Frazer and Van Biesebroeck, 2010; Fernandes et.al., 2019)[8].

Studies drawing on raw trade data on SSA exports to the US (Shapouri and Trueblood, 2003; Brenton and Ikezuki, 2004; Brenton and Hoppe, 2006; Office of US Trade Representative, 2008) find evidence of significant and increasing exports under AGOA. There was a general consensus that most of the rise in exports were concentrated in petroleum and apparel sectors as well as a small number of countries. Similarly, Yatrakis (2002) claimed that $1 billion of trade was created within its first year, accounting for 17% of total SSA exports to the US. However, this was very much limited to five countries, with South Africa responsible for two thirds of exports via AGOA. Given that South Africa is the largest and most developed in the region, which implies fewer internal constraints compared to other beneficiaries, Yatrakis explains that it is not surprising to find South Africa instantly benefitting from AGOA.

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[8] See Condon and Stern (2011) for an interesting review of these studies.

Other studies use longitudinal data and gravity model to assess the extent to which AGOA explained the increase in exports to the US. Although Seyoum (2007) finds no significant effect of AGOA on beneficiaries' overall exports to the US over 2000-2004 period, his analysis of energy, minerals and apparel sectors shows that AGOA-induced statistically significant gains only in the case of apparel exports. Mueller (2008) however finds no such positive contribution even on apparel exports. Nilsson (2007) and Di Rubbo and Canali (2008) did not find significant trade-creating effects for AGOA. Those two studies, however, employed differing levels of aggregation and focussed on different product groups. Nilsson (2007) explored the effects on total exports while Di Rubbo and Canali (2008) focused on agri-products. The ineffectiveness of AGOA in promoting agricultural trade is also observed by Nouve and Staatz (2003), who estimate a gravity model on 2002 data.

By contrast, a number of other empirical work confirm a more positive impact of AGOA. Nouve (2005) captures spill-over effects of AGOA on SSA aggregate exports employs dynamic panel trade model aggregate exports from SSA under AGOA and from SSA to the US up to 2004. The estimates suggest that that each dollar increase in AGOA exports translates into a 16 to 20 cent spill-over effect on aggregate exports to the US. More recently, Didia et al. (2015) perform a cross-country analysis by applying the gravity model using ordinary least squares (OLS) and generalized methods of moments (GMM) estimation technique on aggregated data spanning 12 years. They find a large, positive and significant impact caused by the Act, but the promising results wither once the five major oil producing nations are not included. The authors conclude that there is a disproportionate impact in favour of crude oil exporters, which does not align with the intentions of the Act, and suggest that any future research regarding AGOA should be carried out specifically on non-energy products to remove distortion (Didia et al., 2015). The disentanglement Didia et al. (2015) propose has partly been accomplished in previous work of Tadesse and Fayissa (2008). Using the gravity model to assess the impact of AGOA, they undertake a comprehensive analysis of manufactured and non-manufactured goods at a 2-digit HTS level. The authors state that AGOA had a statistically significant trade initiation effect across 24 of the 99 product categories (compared to negative and significant for just 2 product categories), with the effect on apparel exports being particularly large.

Among all manufactured goods sector, apparel witnessed a particularly sharp rise in exports following AGOA implementation. Collier and Venables (2007) find that the AGOA apparel provision increased apparel exports to the United States by a factor of 7.4

over 1991-2005. They also factor in EU imports in their regression model by considering the value of apparel exports from the exporting country to the US relative to its apparel exports to the EU as the dependent variable. Using dummy variables, they compare the effectiveness of AGOA and EU's 'Everything but Arms' (EBA) initiative on African apparel exports. They find that AGOA has a more favourable effect on African apparel exports compared to EU's trade preferences and attribute this to AGOA's special apparel waiver. Portugal-Perez (2008) reports that the more relaxed rules of origin embodied in the special provision of AGOA increased exports of apparel by about 300 % for the top seven beneficiaries and 96% for the whole sample of 22 countries eligible for the special provision. Using a triple difference-in-differences regression as a means to effectively isolate AGOA and circumvent issues rising from endogeneity of policy, the dispersed impact on apparel products on SSA countries is confirmed by Frazer and Van Biesebroeck (2010) who estimate a variation ranging from 9% to 155% rise in exports, with 5 out the 26 countries being negatively affected. They, however, establish that the impact of the Act on apparel trade for the whole sample of countries is substantial and grows significantly over time from 21.9% in 2002 to 44.4% in 2006. More recently, using the same methodology, Fernandes et.al. (2019) find that AGOA boosted African apparel exports, and the expansion of the GSP increased African exports of other eligible products. They further note that the marginal impacts on African apparel exports grew sharply in the first years of AGOA, but levelled off after the removal of ATC in 2005.

Cook and Jones (2015) looked at less covered aspect of AGOA by evaluating the effects of the Act on the extensive margin of trade (i.e the number of distinct products a country exports) using the fixed-effects Poisson quasi-maximum-likelihood regression. Their empirical results suggest that AGOA stimulates export diversification, especially through its apparel provision. Compared to non AGOA-apparel-eligible countries, AGOA-apparel-eligible countries not only export more apparel products but also more non-apparel products to the USA.

While the bulk of the literature has established that AGOA has been beneficial for apparel exports from SSA to USA, a less-studied aspect of AGOA has been the indirect effect of the agreement on exports to other markets. In other words, is the increase in exports to the USA under AGOA a result of a redirection of exports from elsewhere? This question was briefly answered by Frazer and Van Biesebroeck (2010) as an addition to their main analysis of the impacts of the Act on US imports of various product categories.

Due to lack of data on AGOA country exports to the rest of the world, the authors considered imports into 25 EU countries instead. Estimates of the triple difference-in-differences specification were not statistically significant, showing that an increase in exports under AGOA did not result in a decrease (or increase) in exports to Europe for apparel, agriculture and minerals product categories. On the other hand, EU-25 was found to import more of GSP-manufactures products (i.e non-apparel products) from AGOA countries, which the authors attributed to spill-over effects such as experience from exporting, infrastructure and logistics. Their analysis, however, covered only the years 1999-2000 and 2002-2003.

In this paper, we extend Frazer and Van Biesebroeck's (2010) analysis by considering a longer time span (2001-2016) and focusing solely on the apparel sector and its sub-sectors (knitted and non knitted). This sector is of particular interest since it is one of the three[9] non-crude petroleum sectors where US imports under AGOA are concentrated (USITC, 2014). Indeed, as noted above, previous literature confirms that the bulk of heightened exports to the US under AGOA have predominantly been in the textiles and apparel industries. Our study adds to Frazer and Van Biesebroeck's (2010) in that we examine trade redirection four years before and after the removal of the Agreement of Textile and Clothing (ATC) as well as in the knitted and non-knitted sub-sectors. Since apparel special rule is mostly applicable to the non-knitted sector, our analysis also uncovers whether this more relaxed rule of origin would lead to exports displacement in that sector. The methodology employed also differs from Frazer and Van Biesebroeck's (2010) in that the gravity model framework is used.

4. Model Specification and Data Sources

The Gravity Model

In line with the literature on trade displacement effects, we use the gravity model as our econometric specification. In its basic form, the gravity model posits that trade between two countries is positively influenced by economic size, captured by gross domestic product of the trading partners, and negatively affected by distance between them. The model is usually augmented with other factors aiding or inhibiting trade. Work such as Anderson (1979), Bergstrand (1985), Deardorff (1995), Eaton and Kortum (2002) and Evenett and Keller (2002) have shown that gravity model can be derived from standard

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[9] Excluding crude petroleum (which accounts for around 90% of US imports from AGOA countries), AGOA also benefitted transportation equipment (primarily passenger motor vehicles from South Africa) and refined petroleum products.

trade theories under a range of underlying assumptions, supporting the strong theoretical underpinnings of the model. Empirically, the framework has been extensively employed in various contexts ranging from assessing trade impacts of regional trading agreements and WTO accession to calculation of trade potentials[10]. Another strand of the gravity literature has specifically examined trade displacement effects due to China's emergence: Eichengreen et al. (2004), Greenaway et al. (2008), Amann et al. (2009), Athukorala (2009) have looked at Asian countries' exports displacement due to China's rise; Giovanetti and Sanfilippo (2009) examine China effect on African exports while Giovanetti et. al., (2012) consider China effect on EU exports to OECD markets.

For our purpose, we estimate the following gravity specification:

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\begin{aligned}
lnEUIMP_{ijt} = {} & \beta_0 + \beta_1 lnUSIMP_{jt} + \beta_2 lnGDP_{it} + \beta_3 lnGDP_{jt} + \beta_6 lnDIST_{ij} \\
& + \beta_8 lnAREA_{ij} + \beta_9 Landlocked_{ij} + \beta_{10} Colony_{ijt} + \beta_{11} ComLang_{ij} \\
& + \beta_{12} Polity_{jt} + \beta_{13} lnAfT_{jt} + \varepsilon_{ijt}
\end{aligned}
\tag{1}
$$

where

$EUIMP_{ij}$	Imports of each EU-15 country i from each African country j
$USIMP_{jt}$	US imports from each African country j
GDP_{it}	Real GDP of each EU-15 country i
GDP_{jt}	Real GDP of African country j
$DIST_{ij}$	Distance between country i and j
$AREA_{ij}$	Product of land areas (km^2) of country i and j
$Landlocked_{ij}$	Number of landlocked countries in pair (0/1/2)
$Colony_{ijt}$	Binary dummy =1 if i ever colonized j, zero otherwise
$ComLang_{ij}$	Binary dummy =1 when country i and j share common language, zero otherwise
$Polity_{jt}$	Polity index score of country j
AfT_{jt}	Aid for trade from official donors to each African country j

To re-examine Frazer and Van Biesebroeck's (2010) proposition that the increased apparel exports to the US under AGOA could be a result of redirection of exports from other markets (EU-15 in our case), we formulate the following hypotheses for the full and sub-samples:

Hypothesis 1a: $\beta_1 < 0$ (Displacement of apparel exports to the EU-15)

Hypothesis 1b: $\beta_1 > 0$ (Complementarity of apparel exports to the EU-15)

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[10] See Greenaway et al., (2008) for related studies

We use bilateral imports of each EU-15 country i from each apparel provision eligible African country j as our dependent variable ($EUIMP_{ijt}$). A coefficient on our variable of interest, US imports from the same African exporter country j ($USIMPj$), would indicate displacement of EU exports from an increase in exports to US under AGOA. A positive coefficient would imply that exports to the two markets are complementary.

In its simplest form, the gravity model of trade derived from the Newtonian's universal law of gravity, posits that trade between two countries is positively influenced by their economic masses (measured by GDP) and negatively affected by distance between them. GDP_{it} in our specification captures importers (EU-15) incomes while GDP_{jt} measures exporters (African countries) economic size. On the demand side, a rise in income would be conducive to an increase in imports. On the supply side, an increase in exporting country's GDP implies higher output available for exports.

Since transaction costs increase with distance, one would expect distance ($DIST$) to have a negative impact on bilateral trade. The product of land areas of country pairs ($AREA$) traditionally has a negative relation with the dependent variable as it represents a greater amount of production occurring further away from the borders of a country with the aim of supplying the domestic market (Greenaway et al. 2008). Landlockedness (*Landlocked*) raises transportation costs in terms of port access, therefore negatively affecting bilateral trade. Colonial links (*Colony*) are expected to increase bilateral trade due to the established infrastructure that country j will still benefit from. Sharing a common language (*Comlang*) is another common variable in contemporary gravity models that is known to have a positive impact (Greenaway, 2008; Tadesse and Fayissa, 2008; Didia et al. 2015; Didier and Hoarau, 2016).

Polity captures the effect of better institutionalised democracy of country j and is expected to have a positive influence on trade. Anderson and Marcouiller (2002) proposed that hidden transaction costs such as imperfect contract enforcement have a significant impact on the propensity to trade and should therefore be included in the gravity equation. This has typically been captured by corruption indices in the literature. We use a broader measure of individual exporter's institutional quality and political stability to capture such hidden costs.

Eichengreen et al. (2004, p.13) note that institutional variables (*Polity* in our case) have the additional benefit of being close substitutes for country fixed effects. Moreover, country-pair time-invariant variables such as product of land areas, landlockedness,

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colonial links and common language, already capture country-pair fixed effects. To avoid potential problems of multicollinearity, we do not include fixed effects in our model and opt for pooled estimation[11].

Finally, we augment our gravity model with aid for trade (AfT), which has long been an integral component of development assistance. Aid for trade, however, rose substantially after the initiative was officially launched following the 2005 WTO Ministerial Conference in Hong Kong. AfT aims at improving supply side capacity and trade related infrastructure in developing countries to promote expansion of exports and export composition, encourage integration into the multilateral trading system and help them benefit from liberalised trade and increased market access (OECD, 2013). AfT flows comprise three key components: AfT for economic infrastructure, AfT for productive capacity building and AfT for trade policies and regulations. A number of studies (e.g. Cali and te Velde, 2011; Helble et al., 2012; Bearce et.al., 2013; Berrittella and Zhang, 2014 and Hühne et al. 2014) find that AfT is effective in promoting recipients' exports. We, therefore, include total AfT from official donors as a control in our specification. In line with the literature, (e.g Bearce et. al., 2013; Cali and te Velde, 2011; Brazys, 2010) we use a two-year lag of AfT to account for potential endogeneity of this variable as well as implementation lags.

Descriptive statistics of variables in our specification are presented in Table 1 below. *Colony* and *Comlang* are binary indicator variables. Increases in *Polity* imply an increase in institutionalized democracy over the sample period and varies by country and over time. All other logged variables show reasonable means and variances. It is worth noting that there is a lot of missing values for the dependent variable (LnEUIMP) and variable of interest (LnUSIMP) as well as aid for trade variables.

Table 1: Descriptive Statistics

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[11] Studies such as Eichengreen et. al. (2004), Greenaway et.al. (2008), Giovannetti and Sanfilippo (2009) on displacement effect also use pooled estimation methods.

Variable	Obs	Mean	Std.Dev.	Min	Max
$LnEUIMP_{ijt}$	12495	3.291	4.867	0	19.55
$LnUSIMP_{jt}$	12495	7.421	6.151	0	20.044
$LnGDP_{it}$	12495	27.073	1.144	24.431	28.957
$LnGDP_{jt}$	12015	22.697	1.524	18.59	26.864
$LnDIST_{ij}$	12495	3.771	.121	3.375	4.01
$LnAREA_{ij}$	12495	10.44	.986	7.178	12.137
$Landlocked_{ij}$	12495	.419	.533	0	2
$Colony_{ijt}$	12495	.073	.261	0	1
$Comlang_{ijt}$	12495	.133	.34	0	1
$Polity_{jt}$	11475	2.069	5.197	-9	10
$LnAfT_{t-2}$	11025	15.263	6.490	0	21.282

The correlation matrix is presented in Table A2 in the appendix. A preliminary analysis of the pairwise correlations suggests that they are in general acceptable and show no sign of multicollinearity. To deal with zero trade and flows, we follow previous studies (e.g Rotunno et.al., 2012; Cali and te Velde, 2011; Bearce et.al, 2013) in adding one before taking logs.

Data Sources

Bilateral apparel imports of each EU-15 country from each African country are sourced from EU trade since 1988, Eurostat and converted to US dollars using exchange rate from FRED (2017). Bilateral US imports from Africa are obtained from USITC Interactive Tariff and Trade Dataweb. US GDP deflator, taken from the World Development Indicators (WDI), is then used to calculate real trade values for both EU-15 imports and US imports. Real GDP and real GDP per capita data are also from WDI. Distance, product of land areas, landlockedness, colonial relationships and common language are obtained from CEPII's GEODist database. Polity data is sourced from the Centre for Systemic Peace's Polity IV Annual time series. Information on AGOA and special waiver country eligibilities (presented in Appendix A) are obtained from International Trade Administration (ITA), US Department of Commerce. Data for AfT variables (CRS codes 200 and 300[12]) are drawn from OECD/DAC Creditor Reporting System (CRS) database. We use actual disbursements (following Cali and te Velde, 2011) at 2017 constant prices.

5. Results and Discussion

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[12] CRS code 300 (AfT for Productive capacity) includes AfT for trade policies and regulations in the OECD/CRS database: https://stats.oecd.org/Index.aspx?DataSetCode=CRS1. CRS code 200 represent AfT for Economic infrastructure.

We first estimate equation (1) using the conventional pooled Ordinary Least Squares (OLS) method. Results are shown in Table 2 below. Column (1) shows the gravity estimates for the African countries eligible for the wearing apparel provision over the entire period 2001-2016. To factor in possible effects of the phasing out of the Agreement on Textiles and Clothing (ATC) on Apparel exports, we separately consider four years before the removal of the agreement (2001-2004) and four years after its complete phase out (2005-2008). Results are reported in columns (2) and (3) respectively. We also examine whether AGOA impacts on EU-15 exports differ by type of apparel exported, especially given that AGOA offers more lenient rules of origin. The last two columns (4) and (5) show results for Knitted Apparel (CH61) and Non-knitted Apparel (CH62) sub-sectors.

Table 2: Ordinary Least Squares (OLS) Estimates

Dependent Variable:	(1) All Apparel	(2) All Apparel With ATC	(3) All Apparel Without ATC	(4) Knitted (CH61)	(5) Non-Knitted (CH62)
Log EU-15 Imports	2001-2016	2001-2004	2005-2008	2001-2016	2001-2016
Ln USIMP$_{jt}$	0.291***	0.154***	0.172***	0.149***	0.156***
	(0.019)	(0.035)	(0.025)	(0.017)	(0.015)
Ln GDP$_{it}$	0.832***	1.208***	0.963***	0.690***	0.587***
	(0.127)	(0.213)	(0.159)	(0.134)	(0.104)
Ln GDP$_{jt}$	1.229***	1.942***	1.725***	1.034***	1.117***
	(0.116)	(0.189)	(0.169)	(0.134)	(0.126)
Ln DIST$_{ij}$	1.243	3.004	0.397	6.387***	-1.621*
	(1.281)	(2.208)	(1.726)	(1.241)	(0.913)
Ln AREA$_{ij}$	-1.285***	-1.714***	-1.354***	-1.001***	-0.448**
	(0.240)	(0.351)	(0.286)	(0.244)	(0.181)
Landlocked$_{ij}$	-1.280***	-0.430	-1.770***	-1.434***	-1.169***
	(0.272)	(0.478)	(0.378)	(0.299)	(0.210)
Colony$_{ijt}$	2.825***	3.361***	3.269***	2.511***	3.046***
	(0.751)	(1.190)	(0.926)	(0.877)	(0.757)
Comlang$_{ij}$	2.091***	2.434***	2.299***	1.907***	1.566***
	(0.458)	(0.787)	(0.606)	(0.497)	(0.422)
Polity$_{jt}$	0.062*	0.226***	0.022	0.113***	0.064***
	(0.036)	(0.058)	(0.048)	(0.028)	(0.023)
Ln AfT$_{jt-2}$	-0.004	0.008	-0.891***	-0.014	0.020
	(0.012)	(0.014)	(0.205)	(0.013)	(0.013)
Constant	-40.720***	-69.440***	-33.780***	-53.780***	-29.160***
	(6.335)	(10.110)	(8.592)	(6.955)	(5.423)
Observations	4,875	795	1,275	5,238	4,834
R-squared	0.406	0.435	0.448	0.341	0.286

Robust standard errors in parentheses. *, **, *** indicate insignificance at 10%, 5% and 1% level, respectively

As expected, GDP, and most of the gravity variables are significant and carry the expected signs. AfT and distance, however, do not seem to have much impact on African apparel exports to EU-15. Our variable of interest *USIMP$_{jt}$* is statistically significant and shows no evidence of exports displacement. In fact, the positive coefficients point to some degree of complementarity between African apparel exports to USA and EU-15.

It is possible that our key variable, $USIMP_{jt}$ in equation (1) may not be exogenous. An example of correlation between $USIMP_{jt}$ and the error term, also mentioned in Eichengreen (2004) and Greenaway et. al. (2008), is an improvement in consumer sentiment worldwide. This could increase EU-15's imports of textiles and clothing from Africa as well as US imports from the continent. Endogeneity in this case is mainly due to omitted variables rather than two-way causality. Endogeneity of $USIMP_{jt}$ is formally tested using the endogeneity test, which hypothesizes that the specified regressor can actually be treated as exogenous. A rejection of the null means that the suspect regressor is endogenous and OLS is inappropriate. With a test statistic of 19.741 (p=0.000), we are unable to accept the null of regressor exogeneity.

The standard solution to the problem of endogeneity in gravity and trade displacement literature is to use instrumental variables and the two-stage least squares (2SLS) estimation method. We choose two external instruments that have been widely used in trade displacement literature for the endogenous $USIMP_{jt}$. These are (i) US GDP expressed in natural logarithm and (ii) the distance between US and each African nation, also in natural logarithm. It is reasonable to believe that US imports of apparel would be commensurate to its GDP. By the same token, the bilateral distance is a key determinant of trade between two partners as it is a reflection of transportation costs. To be meaningful, instruments should be correlated with the endogenous variable (instrument relevance) and uncorrelated with the error term (instrument exogeneity).

Table 3 presents the results from the two-sage least squares estimation. The high values of the first-stage F-statistic and statistically non-significant Hansen J statistic confirm the relevance and exogeneity of our instruments respectively. As per apriori expectations, trading partners' GDP, colonial links, common language have a positive influence on African apparel exports to EU-15 while product of land area and landlockedness negatively affect these flows. It is worth recalling that unlike AGOA, EU's preferential schemes are deeply rooted in history, with many EU countries sharing colonial ties and common language with African nations. Distance has the correct negative sign as highlighted in the gravity literature, but is not statistically significant. Given that African exports of apparel to the EU are subject to preferential treatment, distance may not matter as such. Better institutions/democracy do not have a statistically significant impact for the whole sample (Column 1) but do so in the knitted and non-knitted sub-sectors. This may reflect the possibility that aggregation of data may mask certain feature. The two-year

lagged AfT is effective in promoting exports as established by previous studies. This result does not quite hold in the temporal sub-samples possibly to due the relatively short time period (5 years).

Table 3: Two-Stage Least Squares (2SLS) Estimates

Dependent Variable: Log EU-15 Imports	(1) All Apparel	(2) All Apparel With ATC	(3) All Apparel Without ATC	(4) Knitted (CH61)	(5) Non-Knitted (CH62)
	2001-2016	2001-2004	2005-2008	2001-2016	2001-2016
Ln USIMP$_{jt}$	0.484***	0.622***	0.506***	0.809***	0.578*
	(0.050)	(0.167)	(0.163)	(0.162)	(0.339)
Ln GDP$_{it}$	0.844***	1.252***	0.976***	0.683***	0.555***
	(0.128)	(0.233)	(0.167)	(0.161)	(0.116)
Ln GDP$_{jt}$	1.048***	1.700***	1.362***	0.177	1.010***
	(0.116)	(0.208)	(0.235)	(0.253)	(0.155)
Ln DIST$_{ij}$	-0.724	-3.928	-3.717	-1.117	-3.361*
	(1.394)	(3.228)	(2.719)	(2.340)	(1.816)
Ln AREA$_{ij}$	-1.147***	-1.755***	-1.235***	-0.263	-0.110
	(0.217)	(0.346)	(0.274)	(0.277)	(0.292)
Landlocked$_{ij}$	-1.150***	0.338	-1.469***	-0.911***	-1.103***
	(0.267)	(0.546)	(0.386)	(0.336)	(0.215)
Colony$_{ijt}$	2.912***	3.362***	3.477***	2.672***	3.110***
	(0.698)	(1.119)	(0.841)	(0.842)	(0.679)
Comlang$_{ij}$	2.107***	2.885***	2.334***	2.051***	1.667***
	(0.433)	(0.829)	(0.555)	(0.493)	(0.424)
Polity$_{jt}$	0.046	-0.051	-0.038	0.188***	0.069***
	(0.034)	(0.112)	(0.056)	(0.044)	(0.026)
Ln AfT$_{jt-2}$	0.022*	-0.013	-0.787***	0.047**	0.038*
	(0.012)	(0.018)	(0.210)	(0.022)	(0.020)
Constant	-33.120***	-42.730***	-16.620	-20.040*	-26.240***
	(6.812)	(14.000)	(12.730)	(11.770)	(6.593)
Observations	4,875	795	1,275	5,238	4,834
R-squared	0.358	0.299	0.325	-0.278	-0.043
1st Stage F-Stat	414.160	47.830	17.060	26.870	3.070
Hansen J (p-val)	0.1785	0.167	0.474	0.267	0.377

Robust standard errors in parentheses.   *, **, *** indicate insignificance at 10%, 5% and 1% level, respectively.

As far as the variable of interest (*USIMP$_{jt}$*) is concerned, the positive and statistically significant complementary effects of African apparel exports between the USA and EU-15 are maintained across the (sub)samples. This result not only supports Frazer and Van Biesebroeck's (2010) findings that AGOA did not lead to a decrease in exports to Europe but also confirms a complementary effect. Over the entire period (2001-2016), a 1% increase in apparel exports to the US led to 0.48% increase in exports to EU-15. When the structural change from the removal of quotas on exports of textiles and clothing on 1st January 2005 is taken into account, we observe that African nations tend to export slightly less to EU-15 after the phase out. In the four years starting January 2005, a 1% rise in exports to the US led to only 0.51% increase in exports to EU-15 (column 3) compared to a 0.62% increase over the 2001-2004 period (column 2). The complementary effect is also

evident in the apparel sub-sectors (columns 4 and 5). A 1% increase in African knitted exports to the US led to 0.81 % percentage increase in exports to the EU-15. However, a 1% increase in non-knitted apparel exports to the US led to a less than proportionate rise of 0.58% to EU-15 markets.

Displacement effects: LDCs vs non-LDCs

Since the majority of LDCs are located in Africa, it would be relevant to examine the substitutability or complementarity between imports by EU-15 and the US in LDCs and non-LDCs. LDCs inherently suffer from three major constraints: (i) high levels of poverty limiting economic growth; (ii) heavy dependence on commodity, trade and foreign exchange; and (iii) weak productive bases and limited export diversification (UNCTAD, 2016). Despite these high behind the border trade barriers, we still find some evidence of complementary apparel exports to the two markets (Table 4). This effect is more apparent in the non-knitted sector, suggesting that LDCs may be more reliant on trade preferences. Non-LDCs, on the other hand, exhibit patterns similar to our full samples (Full results are in Appendix Tables A3 and A4). With comparatively lower trade hindrances, non-LDCs are able to diversify both exports and markets.

Table 4: Two-Stage Least Squares (2SLS) Estimates: LDCs vs Non-LDCs

Dependent Variable: Log EU-15 Imports	(1) All Apparel	(2) All Apparel With ATC	(3) All Apparel Without ATC	(4) Knitted (CH61)	(5) Non-Knitted (CH62)
	2001-2016	2001-2004	2005-2008	2001-2016	2001-2016
Non-LDCs	0.675***	0.945***	0.704***	0.709***	0.661***
	(0.056)	(0.205)	(0.125)	(0.116)	(0.116)
LDCs	0.299***	-0.101	-0.372	0.218	0.893**
	(0.058)	(0.189)	(0.401)	(0.353)	(0.378)

Robustness checks

It is common practice to include time specific fixed effects in panel regressions. Our results so far did not take into consideration potential shocks restricted to a particular year. We test the robustness of our results by including these time fixed effects. The inclusion of these dummies, however, resulted in the loss of our instrumental variable (Ln USGDP) due to collinearity. In the presence of one instrument, the equation is exactly identified and standard overidentification tests cannot be used (Giovanni and Sanfillippo, 2009). Two additional test statistics for under-identification (Kleibergen-Paap rk LM statistic) and weak identification (Kleibergen-Paap Wald rk F statistic) are, therefore, reported. In the presence of heteroskedastic errors, the Kleibergen-Paap rk statistics LM test rejects the null

of under-identification. Similarly, the significant Kleibergen-Paap Wald rk F statistic implies a rejection of the null of weak identification. Both suggest that the instrument, bilateral distance between US and each African exporter in logarithmic form, is efficient.

Table 5 presents the results with time dummies. Our previous findings are maintained throughout the (sub)samples.

Table 5: Two-Stage Least Squares (2SLS) Estimates with Time Dummies

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	All Apparel	All Apparel with ATC	All Apparel without ATC	Knitted CH61	Non-Knitted
Log EU-15 Imports					CH62
	2001-2016	2001-2004	2005-2008	2001-2016	
Ln USIMP$_{it}$	0.626***	0.681***	0.541***	1.275***	0.579*
	(0.149)	(0.178)	(0.178)	(0.291)	(0.362)
Ln GDP$_{it}$	0.818***	1.258***	0.973***	0.658***	0.562***
	(0.133)	(0.239)	(0.170)	(0.222)	(0.115)
Ln GDP$_{jt}$	1.069***	1.679***	1.308***	-0.528	0.889***
	(0.194)	(0.213)	(0.254)	(0.463)	(0.217)
Ln DIST$_{ij}$	-2.581	-4.852	-4.045	-6.042	-3.044*
	(2.007)	(3.359)	(2.858)	(3.856)	(1.692)
Ln AREA$_{ij}$	-0.955***	-1.768***	-1.220***	0.354	-0.155
	(0.217)	(0.352)	(0.279)	(0.455)	(0.282)
Landlocked$_{ij}$	-1.260***	0.424	-1.456***	-0.616	-1.036***
	(0.284)	(0.564)	(0.390)	(0.503)	(0.225)
Colony$_{ijt}$	2.999***	3.359***	3.503***	2.763***	3.142***
	(0.672)	(1.120)	(0.841)	(1.057)	(0.683)
Comlang$_{ij}$	2.052***	2.942***	2.335***	2.172***	1.653***
	(0.428)	(0.843)	(0.558)	(0.693)	(0.418)
Polity$_{jt}$	0.001	-0.095	-0.044	0.246***	0.063**
	(0.039)	(0.117)	(0.058)	(0.068)	(0.026)
Ln AfT$_{jt-2}$	-0.547***	-0.213	-0.762***	0.068	0.315
	(0.129)	(0.288)	(0.211)	(0.241)	(0.212)
Constant	-16.970	-35.690**	-14.36	4.734	-28.980***
	(11.440)	(14.820)	(13.670)	(18.960)	(6.041)
Observations	4,875	795	1,275	5,238	4,834
R-squared	0.283	0.266	0.305	-0.407	-0.034
Time dummies	yes	yes	yes	yes	yes
K-P rK LM stat	26.143	39.267	19.623	13.848	3.319
p-value	0.000	0.000	0.000	0.000	0.069
K-P Wald rk F stat	38.371	89.252	25.995	17.121	3.470
p-value	0.000	0.000	0.000	0.000	0.063

Robust standard errors in parentheses. *, **, *** indicate insignificance at 10%, 5% and 1% level, respectively.

To address the issue of variable endogeneity whilst ensuring tests for over-identifying restrictions apply, we additionally employ the two-step system generalised methods of moments (GMM). This method allows instruments to be selected from within the model. The validity of moments conditions can be ascertained using statistical tests proposed by Sargan (1958) and Hansen (1982), which are not applicable when the two-stage least squares equation is exactly identified. As before, we treat the variable of interest, *USIMP$_{jt}$* as endogenous. In most regressions, the high value of the Hansen statistic confirms instrument validity. Moreover the "rule-of-thumb" proposed by Roodman (2009a, 2009b) which states that in every regression the instrument count should be less than the number

of groups within the sample is also satisfied in the main samples, indicating that our model does not suffer from the "too many instruments" problem. It is worth noting, however, that due to small time span and missing values, GMM estimations may not be reliable for some subsamples. The GMM results are reported Table A5 in the appendix. The signs and significance of variables are consistent with the two stage least squares estimates. Overall, albeit differences in coefficient magnitudes, results confirm the complementary effect of African apparel exports to the US and EU-15 in the full samples. Due to the short span of time pre- and post ATC, appropriate caveats apply to the GMM estimates.

Discussion

Our results suggest that a complementarity in apparels exports from Africa to US and EU-15 over the 2001-2016 span. Following AGOA's implementation in 2000, apparel exports from the region to the US increased rapidly until expiry of ATC in 2005. Although a number of countries were AGOA-eligible, over 95% of the apparel exports to the US were accounted for by a handful of countries, namely Lesotho, Kenya, Madagascar, Mauritius, Swaziland and South Africa (Gillson et.al, 2007). Investors from quota-constrained suppliers, in particular China and Taiwan, set up factories in some of these countries especially those benefitting from the "third country fabric provision" and used them as backdoors to access US market duty free and quota-free. With the phase out of ATC, many Asian firms closed the apparel facilities, leading to a sharp drop in apparel exports to the US in the first few years following its expiry. Against this backdrop, it is not surprising to find that AGOA did not have any crowding out effect on apparel exports to EU-15, which remained fairly steady since 2000. The weaker complementary effect post ATC termination suggests that less competitive African suppliers took more advantage of AGOA and exported more to the US as opposed to EU-15 in face of mounting competition from South and East Asian apparel exporters that obtained new quota-free access to the developed country markets.

This is also evident over the longer time span in the apparel subsectors. Since EU's rules of origin do not grant producers in African LDCs the freedom to source fabrics from anywhere in the world as is possible under AGOA, one would expect AGOA's special rule beneficiaries to redirect their non-knitted apparel exports to the US at the expense of EU-15. We find evidence of a preference for the US market in this sub-sector but there is no export crowding out. Not surprisingly, African countries tend to favour EU-15 market for their knitted apparel exports, to which EU's more restrictive rules do not apply.

It is worth noting that although a number of African countries are eligible for the Apparel provision, apparel exports originate from only a handful of countries, in particular Lesotho, Kenya, Madagascar, Mauritius, Swaziland and South Africa. Despite the duty-free privilege, other nations have not been successful in expanding their apparel exports due to higher transportation costs to the US relative to EU-15. African apparel also competes head to head against exports to US neighbours who equally benefit from duty-free access under trade arrangements. African nations are further disadvantaged by poor infrastructure, cumbersome customs procedures and dearth of technical and managerial talent. Uncertainty surrounding AGOA and its apparel provision renewals has also prompted African apparel exporters to retain their more secure EU markets. Despite the restrictive rules of origins under EU's EBA program, African apparel producers still stand to benefit from the more liberal cumulation allowances offered by EU's Cotonou Agreement, allowing African apparel exporters to source their fabrics from the region and meet the demands of EU markets.

Overall, despite its efforts to improve beneficiaries' economic and institutional structure and more liberal rules of origin, it can be argued that AGOA did not have the ability to substantially attract exports away from the other major market. A number of reasons could explain this. First, the higher transportation costs resulting from distance and lack of efficient trade linkages to the US market relative to EU-15 is a key barrier that many African nations struggle to overcome (USITC, 2014). Second, the margin of preference enjoyed by African nations under AGOA is shrinking as more countries supply the US under other trade agreements such as Central America Free Trade Agreement (CAFTA) and North American Free Trade Agreement (NAFTA), which account for a larger share of the US apparel market under preference, dwarfing by far African countries' share under AGOA (Naumann, 2012). Third, concerns have been expressed over the short term and last minute renewals of the third country fabric provision. Before its latest new lease of life in 2015, the provision was renewed for periods of only three to five years, which are deemed as not certain enough to place new orders or undertake new investments (USITC, 2014). Investment decisions can also be influenced by the revocation of AGOA status if eligibility criteria are not met. With a high likelihood that some fragile African states may not meet these criteria, they are likely to revert to weak governance, hence forestalling potential investments that would only be profitable with free market access.

6. Conclusion

This paper extends the literature by examining potential displacement effect of apparel exports to the EU as a result of increased exports under AGOA over the period 2001-2016 using the gravity model. We use the two-stage least squares to address the problem of endogeneity of the variable of interest. Empirical results show no evidence of displacement but instead reveal a complementary effect between exports to the two markets. This positive effect still holds in the Non-Knitted (CH62) apparel sector despite a more relaxed rule of origin offered under AGOA compared to EU's EBA and Cotonou Agreement. However, for every percentage increase in exports of Non-Knitted apparel to the US, there is a less than proportionate increase to EU-15, suggesting that the special waiver under AGOA remains attractive to African apparel exporters. Not surprisingly, EU-15 markets attract more Knitted apparel from Africa than does the US. Our main finding of complementarity from the two-stage least squares are confirmed by the dynamic two-step GMM estimates although coefficients are smaller in magnitude. We also find some evidence of complementary apparel exports to both LDCs and non-LDCs with stronger effects for non-LDCs and in non-knitted sector.

Future work could consider the longer life span of AGOA following its latest renewal in 2015. This would allow one to also capture the on-going changes in EU trade arrangements in particular implementation of Economic Partnership Agreement (EPAs). This new agreement comes with more flexible rules of origin requiring single transformation instead of the double step. As most African nations are still in the process of adopting EPAs, new research can shed more light on complementary or displacement effects once these agreements are adopted.

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	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Angola				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Benin	✓	✓	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Botswana	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Burkina Faso						✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Burundi						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cameroon	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Cape Verde	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Central Af Rep	✓	✓	✓													✓
Chad	✓	✓	✓	✓	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Comoros								✓	✓	✓	✓	✓	✓	✓	✓	✓
Congo Dem R			✓	✓	✓	✓	✓	✓	✓	✓						
Congo Rep	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cote d'Ivoire		✓	✓[AS]	✓[AS]							✓	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Djibouti	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Eq. Guinea																
Eritrea	✓	✓	✓													
Ethiopia	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Gabon	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gambia			✓	✓	✓	✓	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]		
Ghana	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Guinea	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Guinea Bissau	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Kenya	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Lesotho	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Liberia							✓	✓	✓	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Madagascar	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]					✓[AS]	✓[AS]	✓[AS]
Malawi	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Mali	✓	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]		✓	✓	✓
Mauritania	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓
Mauritius	✓[A]	✓[A]	✓[A]	✓[AS]	✓[AS]	✓[AS]	✓[A]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Mozambique	✓[A]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Namibia	✓[A]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Niger	✓[A]	✓[A]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]			✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Nigeria	✓[A]	✓[A]	✓[A]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Rwanda	✓[A]	✓[A]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Sao Tome	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Senegal	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Seychelles	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sierra Leone	✓	✓	✓	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]	✓[AS]
Somalia																
South Africa	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]	✓[A]

Country	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
South Sudan														✓	✓	
Sudan																
Swaziland	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ		
Tanzania	✓	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ
Togo								✓	✓	✓	✓	✓	✓	✓	✓	✓
Uganda	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ
Zambia	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ	✓ᴬˢ
Zimbabwe																

Source: United States International Trade Commission, (2014). Updated using information from USITC Dataweb and AGOA.info (https://agoa.info/about-agoa/country-eligibility.html)

Key: ✓: Eligible for AGOA; ᴬ Eligible for Apparel Provision; ˢ Eligible for Special Rule

EU-15 Countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

Least Developed Countries (LDCs) in Africa in 2015 (as per UNCTAD, 2016): Angola, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, The Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Uganda, Zambia.

Appendix: Table A2- Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) $LnUSIMP_{ijt}$	1.000									
(2) $LnGDP_{it}$	0.002	1.000								
(3) $LnGDP_{jt}$	0.112	0.009	1.000							
(4) $LnDIST_{ij}$	0.364	-0.028	0.112	1.000						
(5) $LnAREA_{ij}$	-0.166	0.097	0.529	-0.123	1.000					
(6) $Landlocked_{ij}$	0.055	-0.213	-0.044	0.147	0.062	1.000				
(7) $Colony_{ij}$	-0.002	0.066	0.015	-0.007	0.076	-0.069	1.000			
(8) $Comlang_{ij}$	0.030	-0.037	0.015	0.047	-0.077	-0.078	0.580	1.000		
(9) $Polity_{jt}$	0.144	0.001	0.158	0.200	-0.008	-0.130	0.019	0.006	1.000	
(10) $LnAfT_{jt-2}$	-0.061	0.021	0.242	-0.026	0.135	0.001	-0.003	0.004	0.058	1.000

Appendix: Table A3- Least Developed Countries (LDCs)-Two-Stage Least Squares (2SLS) Estimates

Dependent Variable: Log EU-15 Imports	(1) All Apparel	(2) All Apparel With ATC	(3) All Apparel Without ATC	(4) Knitted (CH61)	(5) Non-Knitted (CH62)
	2001-2016	2001-2004	2005-2008	2001-2016	2001-2016
Ln USIMP$_{jt}$	0.299***	-0.101	-0.372	0.218	0.893**
	(0.058)	(0.189)	(0.401)	(0.353)	(0.378)
Ln GDP$_{it}$	0.616***	0.934***	0.610**	0.509***	0.405***
	(0.133)	(0.228)	(0.243)	(0.157)	(0.153)
Ln GDP$_{jt}$	1.055***	0.150	0.279	0.474	2.056***
	(0.209)	(0.516)	(1.243)	(0.353)	(0.522)
Ln DIST$_{ij}$	-3.470**	-5.078	3.332	4.237*	-1.687
	(1.367)	(3.550)	(6.159)	(2.181)	(1.266)
Ln AREA$_{ij}$	-0.0639	0.480	-0.287	0.228	-0.005
	(0.256)	(0.456)	(0.577)	(0.251)	(0.254)
Landlocked$_{ij}$	-0.653**	-0.429	-0.842	-1.303***	-1.209***
	(0.299)	(0.610)	(0.650)	(0.375)	(0.352)
Colony$_{ijt}$	2.727***	2.686	2.851	2.521**	3.403***
	(0.878)	(1.818)	(2.087)	(1.085)	(0.886)
Comlang$_{ij}$	2.218***	1.964**	2.194*	1.592***	1.589***
	(0.440)	(0.877)	(1.280)	(0.489)	(0.594)
Polity$_{jt}$	0.068*	0.207*	0.115	0.020	0.013
	(0.038)	(0.107)	(0.096)	(0.033)	(0.041)
Ln AfT$_{jt-2}$	0.042***	0.043**	0.265	0.021	-0.006
	(0.014)	(0.018)	(0.675)	(0.014)	(0.022)
Constant	-27.530***	-11.780	-31.350*	-41.930***	-54.290***
	(6.816)	(15.670)	(16.320)	(12.450)	(13.530)
Observations	2,820	420	735	3,130	3,161
R-squared	0.256	0.179	-0.326	0.202	-0.659
1st Stage F-Stat	131.798	11.134	3.104	3.549	4.578
Hansen J (p-val)	0.004	0.239	0.043	0.038	0.761

Appendix: Table A4- Non-Least Developed Countries (Non-LDCs)-Two-Stage Least Squares (2SLS) Estimates

Dependent Variable: Log EU Imports	(1) All Apparel	(2) All Apparel With ATC	(3) All Apparel Without ATC	(4) Knitted (CH61)	(5) Non-Knitted (CH62)
	2001-2016	2001-2004	2005-2008	2001-2016	2001-2016
Ln USIMP$_{jt}$	0.675***	0.945***	0.704***	0.709***	0.661***
	(0.0598)	(0.205)	(0.125)	(0.116)	(0.116)
Ln GDP$_{it}$	1.128***	1.717***	1.403***	0.743***	0.708***
	(0.227)	(0.382)	(0.302)	(0.242)	(0.212)
Ln GDP$_{jt}$	0.724***	1.253***	1.100***	0.311	0.455*
	(0.180)	(0.310)	(0.258)	(0.262)	(0.260)
Ln DIST$_{ij}$	2.911	0.979	-3.521	1.686	-6.636**
	(2.592)	(4.545)	(4.333)	(3.388)	(3.151)
Ln AREA$_{ij}$	-1.711***	-2.614***	-1.457***	-0.756**	-0.235
	(0.261)	(0.430)	(0.428)	(0.327)	(0.324)
Landlocked$_{ij}$	-1.101**	2.076**	-2.071***	-2.077***	-2.050***
	(0.518)	(0.989)	(0.788)	(0.549)	(0.546)
Colony$_{ijt}$	2.988***	3.735**	2.928***	2.170*	2.984***
	(1.015)	(1.502)	(1.104)	(1.257)	(1.128)
Comlang$_{ij}$	1.847***	3.332***	2.052***	2.443***	1.893**
	(0.612)	(1.197)	(0.747)	(0.690)	(0.831)
Polity$_{jt}$	-0.0476	-0.416***	-0.016	0.270***	0.119***
	(0.062)	(0.143)	(0.087)	(0.053)	(0.041)

	(1)	(2)	(3)	(4)	(5)
Ln AfT$_{jt-2}$	0.036*	-0.075**	-1.245***	0.046*	0.059*
	(0.021)	(0.031)	(0.335)	(0.028)	(0.034)
Constant	-42.490***	-56.440***	-14.670	-29.840*	-4.900
	(13.120)	(20.310)	(22.290)	(16.960)	(14.140)
Observations	2,055	375	540	2,108	1,673
R-squared	0.356	0.311	0.256	0.037	-0.220
1st Stage F-Stat	404.080	63.014	117.534	97.218	63.416
Hansen J (p-val)	0.144	0.147	0.267	0.003	0.134

Appendix: Table A5- Dynamic Two-step GMM Estimates

	(1)	(2)	(3)	(4)	(5)
Dependent Variable: *Log EU Imports*	All Apparel	All Apparel with ATC	All Apparel without ATC	Knitted CH61	Non-Knitted CH62
	2001-2016	2001-2004	2005-2008	2001-2016	2001-2016
Ln EUIMP$_{iit-1}$	0.178***	0.288***	0.225***	0.264***	0.825***
	(0.041)	(0.073)	(0.049)	(0.042)	(0.050)
Ln USIMP$_{jt}$	0.198***	0.060	0.015	0.084***	0.038**
	(0.037)	(0.050)	(0.024)	(0.019)	(0.017)
Ln GDP$_{it}$	0.710***	0.775***	0.778***	0.494***	0.114***
	(0.135)	(0.197)	(0.159)	(0.120)	(0.044)
Ln GDP$_{jt}$	0.944***	1.465***	1.280***	0.643***	0.195***
	(0.151)	(0.205)	(0.179)	(0.135)	(0.072)
Ln DIST$_{ij}$	1.445	2.712	2.600*	3.588***	0.056
	(1.266)	(2.156)	(1.498)	(1.078)	(0.316)
Ln AREA$_{ij}$	-0.935***	-1.313***	-1.305***	-0.759***	-0.030
	(0.254)	(0.354)	(0.339)	(0.221)	(0.058)
Landlocked$_{ij}$	-0.858***	-0.447	-1.229***	-0.894***	-0.207**
	(0.296)	(0.452)	(0.384)	(0.255)	(0.095)
Colony$_{ijt}$	2.680***	2.329**	2.704***	2.743***	0.495
	(0.823)	(0.970)	(0.988)	(0.865)	(0.329)
Comlang$_{ij}$	1.834***	2.120**	1.796**	1.411**	0.314**
	(0.571)	(0.844)	(0.758)	(0.560)	(0.151)
Polity$_{jt}$	0.057*	0.179***	0.083*	0.068***	0.010
	(0.032)	(0.061)	(0.044)	(0.025)	(0.009)
Ln AfT$_{jt-2}$	0.135	-0.099	-0.021	0.339***	0.089
	(0.181)	(0.527)	(0.220)	(0.127)	(0.072)
Constant	-40.950***	0	-42.690***	-41.810***	-8.949***
	(6.827)	(0)	(8.322)	(7.170)	(2.590)
Observations	5,025	945	1,275	5,488	5,034
AR(1) Arellano Bond (p value)	0.000	0.000	0.000	0.000	0.000
AR(1) Arellano Bond (p value)	0.202	0.139	0.419	0.014	0.159
Hansen (p value)	0.276	-	0.000	0.329	0.242
No. of Instruments	80	26	46	136	192
No .of Country pairs	375	300	330	420	405
Time dummies included	yes	yes	yes	yes	yes

Robust standard errors are computed having applied Windmeijer's (2005) finite sample correction.

*, **, *** indicate insignificance at 10%, 5% and 1% level, respectively.