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# Assessing the Impact of Development Cooperation: the Case of African Growth and Opportunity Act (AGOA) and U.S. Imports from Sub-Saharan Africa

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*Abstract*

We evaluate the impact of the unilateral trade policy concession known as African Growth and Opportunity Act (AGOA) on U.S. imports from eligible Sub-Saharan African (SSA) countries. Using U.S.-SSA countries' trade data that span the years 1991-2006, we find that AGOA has contributed to the initiation of new and the intensification of existing U.S. imports in both manufactured and non-manufactured goods and several product categories. However, compared to its import initiation impact, the import intensification effect of the Act has been marginal. Our results have important policy implication for further intensification of African exports to the U.S. markets.

*Key words:* *AGOA, Trade Agreements, Trade Initiation, Trade Intensification*
*JEL codes:* *F13, F14, F15*

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## I. Introduction

This paper empirically examines whether or not the recent unilateral trade policy change granted by the U.S. to selected Sub-Saharan African (SSA) countries under the rubric of "Africa Growth Opportunity Act (AGOA)" has contributed to increased U.S. imports from the eligible SSA countries. Signed into the U.S. laws on May 18, 2000, AGOA provides the eligible countries duty-and quota-free export access to the U.S. markets so that they continue to open their economies and build free markets. As of June 2007, thirty-eight of the forty eight SSA countries are declared eligible for benefits under the program. Since its implementation, several agencies from both AGOA stakeholders and international financial institutions have invested substantial amount of resources to help eligible African countries to effectively utilize the benefits of the program.[1]

Free trade agreements, whether unilateral or bilateral, are historically expected to raise trade flows among the partners to the agreement, thereby contributing to enhanced long-run economic growth of the parties involved. Carrere (2004), Romalis (2003), and Gould (1998) document that the removal of tariffs on imports of several items into the U.S., Japan, Europe, and Canada increased trade flows in the order of 11 percent. Proponents of AGOA thus argue that by expanding preferential export access to the U.S. markets in more than 2000 different products, AGOA has the potential to increase trade flows between the U.S. and SSA countries and thereby spur long-term economic growth of the eligible countries. To this end, Ianchovichina et al. (2001) speculate a roughly 14

[1] As a result, in addition to the ongoing trade capacity building (TCB) works conducted by regional trade competitiveness hubs in Ghana, Botswana, and Kenya, a fourth hub was opened in Dakar, Senegal in October 2005 to help eligible African countries increase their exports under AGOA

percent increase in SSA exports, if granted a preferential market access to the European Union, Japan, U.S., and Canada.

Critics of trade policy changes in general and AGOA in particular, however, question the potential benefits of such a unilateral policy initiative by arguing that (i) African exports to U.S. are dominated by petroleum products that have relatively low value added and (ii) the existing U.S.-Africa trade is dominated by imports from a few African countries (Nouve and Staatz, 2003). Collier and Gunning (1999) attribute the chief factors explaining Africa's poor economic performance to: distorted product and credit markets, high risk, inadequate social capital and infrastructure, and poor public service. While Lindsey (2002) maintains that U.S. and OECD countries' trade policy initiatives in general have mixed signals, citing transport costs as major constraint to African trade, Blackman and Mutume (1998), Mutume (1998) and Raghavan(2000) also stipulate that AGOA's benefits for most African countries would remain illusory.

A cursory review of the available reports and data on U.S. trade with SSA countries after the implementation of AGOA, on the other hand, seems to indicate the contrary. According to USAID (2006), for example, between 2004 and 2005 alone, there has been a 40 percent increase in the total volume of U.S. imports from SSA countries. Analysis of U.S.-SSA trade data that extend from 1989 to 2004 also reveals a 46.3 percent increase in U.S. imports of non-manufactured goods and a 130.4 percent increase in U.S. imports of manufactured goods from SSA countries pre- to post-AGOA periods. Although these figures appear to indicate a rise in the post AGOA U.S. imports from SSA, whether the changes are the result of the unilateral trade policy concession, or the inertia in the eligible

SSA countries' global trade pattern, or adjustments in other economic policies of the SSA countries, or a combination of these factors is not clear cut.

In this study, we use aggregate and disaggregated (at 2-digit Harmonized System - HS) U.S. imports from each AGOA eligible SSA country for the years 1991-2006, control for country and time specific determinants of bilateral trade flow, and investigate if the increase in the volume of U.S. imports from AGOA eligible SSA countries can be attributed to the implementation of the Act. Further expanding the available literature, we also evaluate the effect of the policy change in terms of: (i) its contribution to the initiation of imports (i.e. changing imports from 0 or some unobservable level to a positive or observable threshold) which we call trade-initiation effect and (ii) subject to the existence of positive import flows prior to the policy change, its effect on the volume of U.S. imports. We call this latter effect a trade-intensification effect. Our work thus contributes to the literature in several ways. First, we help differentiate facts from descriptive reports often prepared to sway critics on the policy initiative by empirically examining whether the increase in the trade flow between the U.S. and eligible SSA countries can be attributed to the implementation of the policy initiative. Second, we highlight areas where emphasis should be placed to further enhance the success of the initiative by identifying factors that determine the initiation as well as the intensification of the existing level of U.S. imports from the eligible SSA countries.

The remainder of this paper proceeds as follows. Section II discusses the relevant literature. Section III presents the analytical framework, explanatory variables, data, and the empirical model. Results and conclusions are presented in sections IV and V, respectively.

## II. Related literature

Although AGOA was designed with the standard economic benefits of trade policies (creation of employment and specialization which leads to productivity improvements and per capita income growth) in mind, the realization of the potential benefits of the Act in improving Africa's exports to the U.S. has been a subject of series of debates. The available critics vary from those who assert that the removal of trade barriers on textiles and apparels originating from Africa would result only in a massive loss of U.S. jobs (Cooper, 2002; Friedman, 2000a and 2000b) to those who question the potential benefits of the Act for most of SSA countries (Raghavan, 2000, and Nouve and Staatz, 2003) by arguing that SSA countries' exports to U.S. are dominated by petroleum products and are concentrated in a few countries (such as Nigeria and South Africa). Rodrik (1998), Wang and Winters (1998), Collier and Gunning (1999), and Limao and Venables (2001) attribute the causes of poor African export performance to low per capita income, small country size, geography, lack of infrastructure, and domestic trade policies rather than high tariff. Morrissey and Rudahernawa (1998) indicate that the removal of export duties, the liberalization of foreign exchanges markets and trade may not increase export earnings, while Milner et al. (2000) based on Uganda's data observe that transport costs constrain African trade. Direct observations and inferences from these studies make the impact of unilateral trade policy initiatives such as AGOA, an open empirical question.

The literature on SSA trade in general and the U.S.-SSA countries' trade in particular is limited. Using information on pre-AGOA tariffs and assumptions on supply response and assuming the rules of origin on yarn, Mattoo et al. (2003) predict that African

textile exports to the U.S. will rise by 5 percent. Ianchovichina et al. (2001) speculate that African exports to increase roughly by 14 percent if granted a preferential market access to the European Union, Japan, the U.S., and Canada.

Given that a few years have elapsed since AGOA was enacted into the U.S. laws, only very few studies have attempted to empirically assess the impact of the Act. Among the available studies, using panel data of U.S. agricultural trade with 46 SSA countries, Nouve and Staatz (2003) find that gains induced by AGOA in increasing agricultural exports were not significantly different from zero, although the response of African exports to the U.S. was positive as stipulated in the legislation. Employing the triple difference-in-difference method of controlling for the "endogeneity of policy" Frazer and Van Biesebroeck (2007) conduct an in-depth study of important policy implication with greater data coverage. The authors find that AGOA has had large and robust impact on U.S. apparel imports from SSA countries. Citing positive achievements under AGOA, Collier and Venables (2007) also indicate that trade preferences such as AGOA serve as a catalyst for trade in manufactured goods, leading to rapid growth in exports and employment. Their study thus stresses the need for designing trade preferences that are consistent with international trade in fragmented 'tasks' (as opposed to complete products) and making them open to countries with sufficient levels of complementary inputs such as skills and infrastructure. While very similar in data coverage and objective to the works of Frazer and Van Biesebroeck (2007) and Collier and Venables (2007), our study employs HS-2 level disaggregated trade data and a more comprehensive analytical approach that allows us to separate the trade (imports) initiation impact of the implementation of the Act from its trade (import) intensification effect.

## III. The Theoretical Framework and Empirical Model

### 3.1. The Theoretical Framework

To examine the effect of AGOA on the eligible SSA countries' exports to the U.S., we use the gravity model. Tinbergen (1962) first applied the gravity specification to study trade flows. Since then, the model has been extensively used in international trade applications because of its traceable empirical appeal and robustness. The model specifies bilateral trade flows between countries as a function of their respective incomes and geographic distance. The lack of a theoretical underpinning has been initially cited as a major problem for the gravity model. However, more recently, researchers have established theoretical foundations for the model (Anderson and van Wincoop, 2003; Feenstra et al., 2001; Eaton and Kortum, 2002; Deardorff, 1998; Davis, 1995; Bergstrand, 1985; Helpman and Krugman, 1985; and Anderson, 1979). In its basic form, the model posits that country i's export to, or import $M_{ijt}$ from nation j during a given year t increases with the trading partners' combined economic mass, given as the product of gross domestic product of the exporting ($GDP_{it}$) and the importing countries' ($GDP_{jt}$) and decreases with the geographical distance ($D_{ij}$) between the trading partners, a proxy for transportation cost. Taking $\Lambda$ as the constant of proportionality, equation (1) below illustrates the theoretical relationship.

$$M_{ijt} = \Lambda\left(\frac{GDP_{it}GDP_{jt}}{D_{ij}}\right) \tag{1}$$

The theoretical model suggests that higher $GDP_{jt}$ values in importing country imply greater potential for imports while higher $GDP_{it}$ values in the exporting country imply increased capacities for export. $D_{ij}$ represents the distance between U.S. (New York) j and the capital city of each AGOA eligible SSA country i (measured in kilometres using the great circle method) and as a proxy for transportation costs.

### 3.2. The Empirical Model and Data

To control for additional factors that influence trade flows, we augment the basic gravity specification with sets of trade-inhibiting and trade-facilitating variables such as the stock of immigrant population from each African nation residing in the U.S., whether English is the official language in the beneficiary SSA country, a dummy variable that indicates if each SSA country has access to the sea, and an index of economic openness. We also include a dummy variable (AGOA) which takes a value of 1 if the country has been declared eligible for the benefits described in the unilateral trade initiative (i.e., can export to the U.S. free of any quota) as of a given year *t* or 0, otherwise. Although a country is declared eligible for benefits under the Act, it may not start exporting eligible products right away for various reasons (including but not limited to bureaucratic arrangements, and lack of adequate information). However, once exporters start benefiting from utilization of benefits under the Act, we consider that their experiences stimulate other exporters and/or exports in other products. To capture this effect, we augment the gravity model with a variable that measures the number of years elapsed since each SSA country has started exporting its first product under AGOA. To account for the country specific and year to year fluctuations in

macroeconomic factors that affect a country's export performance, we also add country and year specific dummy variables to the model. Taking the natural logarithm of the continuous variables and adding an assumed independently and identically distributed error term ($\varepsilon_{ijt}$), our empirical model is given as follows:

$$\begin{aligned}\ln M_{ijt}^{k} = {} & \beta_0 + \beta_1 \ln \mathrm{DIST}_{ij} + \beta_2 \ln GDP_{jt} + \beta_3 \ln GDP_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln POP_{jt} \\ & + \beta_6 \ln \mathrm{IMM}_{ijt} + \beta_7 \ln GDEF_{it} + \beta_8 \ln GDEF_{jt} + \beta_9 \ln EXRT_{ijt} + \beta_{10} ENG_i + \beta_{11} LLCK_j \\ & + \beta_{12} AGOA + \beta_{13} YREXP + \beta_{14} \ln OPEN + \beta_{15} M_{ijt-1}^{k} + \Omega' SSA_i + \Psi' YRD_t + \xi_{ijt} \qquad (2)\end{aligned}$$

Where *ln* is the natural logarithm, *i* is the exporter (SSA country), *j* is the importer country (U.S.), *t* is the year, and $M_{ijt}^{k}$ is the real value of U.S. imports of products in SITC-1 digit level industry classification k(0-9), or a more HS-2 digit level disaggregated product classification k = 00, 01, 02, …, 99 from each SSA nation i at time t, $DIST_{ij}$ is the distance from the capital of each SSA country i to New York j (measured in kilometres using the great circle method). $GDP$ and $POP$ refer to the real gross domestic product and the population size of each SSA country. Following Gould (1994), we control for the relative domestic price levels using each SSA country's GDP deflator, $GDEF_{it}$ and that of the U.S., $GDEF_{jt}$. To capture the potential effects of each country's terms of trade with the U.S., we include $EXRT_{ijt}$, the annual change in the each SSA country's exchange rate against the U.S. dollar. Expressed as each of the SSA country's currency units per U.S. dollar, an increase in the value of this index indicates depreciation of country *j*'s currency

against the U.S. dollar and is thus expected to increase U.S. imports from each country. Following Eichengreen and Irwin (1996), we include a one-year lag of the dependent variable, $M_{ijt-1}^{k}$ to capture the inertia effect of the previous levels of U.S. imports from each country.

Prior research have established that immigrants exert positive influences on trade through three broad and related channels: via preferences for home country goods, by supplying otherwise unavailable information to individuals involved in trade, and through informal mechanisms that help to enforce contracts (See, White, 2007; Globerman, 2001;, Dunlevy and Hutchinson, 1999; Head and Ries, 1998; and Gould, 1994). Thus we augment the model with $IMM_{ijt}$, the stock of immigrants from each SSA country i residing in the U.S. in a given year t adjusted for the annual in- and out-flows of immigrant population from the corresponding SSA country. The immigrant stock variable is constructed following White (2007) and White and Tadesse (2007). In line with the extant the literature (Globerman, 2001; Rauch and Watson, 2002; and Rauch and Trindade, 2002) on immigrant-trade link, we expect that SSA immigrants to increase U.S. imports from their respective countries as they might arrive with preferences for home country goods and fail to find desired products and acceptable substitutes. In addition, SSA immigrants could increase U.S. trade with their respective home countries as they might have connections to business, or social networks, or possess knowledge of political, or social obligations required to conduct business in their home countries, which in turn, convey otherwise unknown information regarding trading opportunities, reduce transaction costs and lax in contract enforcement, and deter opportunistic behaviour.

countries spanning the years 1991-2006 are employed.[2] The GDP and population data for each country are from the World Bank Development Indicators CD (2006). Wherever applicable, values for all financial variables have been normalized to the 1995 U.S. constant prices.

Lastly, following White (2007), we include $OPEN_{it}$ as a measure of the economic openness of each SSA country and a set of country ($SSA_i$) and year ($YRD_t$) specific variables to account for country and time heterogeneities in the SSA countries' economic and trade policies not accounted by the other variables included in the model.

### 3.3. Estimation of the Empirical Model

First, we estimate the model in equation (2) using aggregate, manufactured and non-manufactured trade measures of U.S. imports from SSA, and each of the five non-manufactured (SITC0-SITC4) and manufactured goods (SITC5-SITC9) sub-categories. Concessions under AGOA are, however, product specific. Hence the use of aggregate imports or SITC-1 digit level product classification might not be sufficient to disentangle the effects of the Act on product level U.S. imports. Thus, we further employ HS-2 digit level disaggregated U.S. import measures to analyze the effect of the implementation of the Act on each of the 99 different HS-2 level product classifications. As the main purpose of our study is to examine the impact of the implementation of the Act on U.S. imports by

[2] For some countries information on one or more of the explanatory variables are missing for certain years, making the data unbalanced panel.

discerning its trade initiation from its intensification effects, we employ the error component structure in estimating our empirical model. [3]

We derive the coefficients of the variables included in our model by employing a Tobit specification, which is justified on both theoretical and empirical grounds: the data generation process (DGP), the conduciveness of the method in addressing our objective (separating the trade initiation from the trade intensification effect of the Act), and empirical considerations. First, the theoretical gravity model in equation (1) strictly predicts positive realizations of trade (imports). However, trade data often contain cases wherein the values are equal to zero.[4] To permit a realization of zero trade values, Eaton and Tamura (1994) modify the gravity model by subtracting an amount from the level predicted by the theoretical gravity model, making the latent trade values to assume any value, thus allowing the observed imports and/or exports to be set to zero. The Tobit model allows such a realization (Wooldridge, 2002). Second, McDonald and Moffitt's (1980) decomposition of the coefficient estimates through which we separate the trade initiation and intensification effects of our variable of interest is possible only with Tobit specification. The Tobit model is also used widely in gravity based trade studies (See, for example, Tadesse and White, 2007; Head and Ries, 1998, and Eaton and Tamura, 1994).

[3] Although the model we estimate by including country and time specific dummy variables can be considered as fixed effects model, we do not employ the standard Maximum Likelihood approach to estimate the error component model as we want to explore the cross sectional dimension of the data while controlling for the standard gravity model based on time invariant and country specific variables such as *Distance* and *Language*. Head and Reis (1998) also employ similar approach. The time and country specific dummy variables allow the error to take on a different mean in each year as well as separate means for observations corresponding to different SSA countries.

[4] Zero and even negative realization of trade flows are possible when considering the "iceberg model" where a portion of the product (ice) being traded is expected to melt in the process of transaction (i.e., as a payment for transaction and/or transportation costs).

Finally, we use the McDonald and Moffitt (1980) method to decompose the coefficient estimate of our variable of interest, the AGOA dummy, to obtain two separate marginal effects: the likelihood that the dependent variable (import) changes from zero to above zero, and subject to positive values of trade, the amount by which the trade measure changes used as dependent variable changes from its average value. This allows us to separate the impact of the implementation of the Act into trade-initiation (the likelihood of U.S. imports to be above 0, or some observable threshold) and trade-intensification (i.e., the increase in the average value of U.S. imports) effects.

## IV. Results

### 4.1. Comparing Pre- and Post-AGOA U.S. Imports from Eligible SSA Countries

Table-1 provides average annual values (pre- and post-AGOA) of aggregate U.S. imports from each AGOA eligible SSA country and brief descriptive statistics of the variables included in the empirical model.

*<Insert Table 1 here>*

As it can be observed from the table, we find a significant post-AGOA increase in the volume of U.S. imports from 17 countries (namely, Angola, Botswana, Burundi, Cameroon, Cape Verde, Djibouti, Equatorial Guinea, Ghana, Kenya, Lesotho, Liberia, Madagascar, Namibia, Seychelles, South Africa, Swaziland, and Zambia). However, the number of years elapsed since each SSA country has been declared eligible for benefits

under AGOA varies from country to country. There is also a substantial difference in the socio-economic characteristics of these nations and their respective share in the aggregate U.S. imports from Africa. As observed from previous studies and by sceptics of the success of AGOA, both in the pre-and post-AGOA periods, U.S. trade with SSA is limited to a few countries. South Africa alone accounts for more than half of U.S. imports from the AGOA eligible SSA countries.[5] Although Madagascar, Mauritius, Lesotho, Kenya, and Ghana account for a tangible share of SSA countries' exports to the U.S., the magnitude is substantially small.

It is also very interesting to note that the post- AGOA statistically significant increase in U.S. imports from some of these nations do not necessarily follow their relative export share. While accounting for only a very small proportion of SSA countries' exports to the U.S., for example, compared to pre-AGOA periods, there has been a significant increase in the exports of countries such as Burundi, Cameroon, and Botswana, a trend that if allowed to continue could enable some of these nations to be important players in the U.S.-SSA trade. Yet, as the post-AGOA statistically significant increase in SSA's exports to the U.S. could be driven by a rise in exports of products that do not necessarily qualify for benefits under the Act, or by changes in other macro-economic variables and/or trade policies of these nations, or combinations of these and several other factors, crediting AGOA based on results from such descriptive analysis without accounting for the potential influence of other determinants of trade is impossible. We thus, resort to our empirical model in which we account for all other determinants of trade flow to determine whether or

[5] The share of South Africa in total U.S imports from SSA countries rises to 71% when considering African exports of all products to the U.S. Note, however, that the data in Table-2 exclude African exports of goods in HS-27(Fuel and oil) and HS-71 (Natural Pearls and/or Stones) categories.

not AGOA has had a role in changing the volume of U.S. imports from eligible SSA countries.

### 4.2. Econometric Results

We first estimate equation (2) using U.S. imports of aggregate and its sub-classification of non-manufactured goods (together with the corresponding SITC: 0-4 sub-classifications) and manufactured goods (and their subsequent SITC: 5-9 sub-categories) as dependent variables. [6] Just as every SSA country is not eligible for benefits under the Act, AGOA does not exempt all products from tariff and quota limitations. Disentangling the effect of the implementation of the Act thus requires conducting the analysis at higher level of product dis-aggregation. While the natural extension of our aggregate data is to use SITC-2 or higher levels of product classification, we use HS-2 digit level product sub-classification that results in 99 different product categories due to lack of dis-aggregated trade data at the corresponding higher digit SITC dis-aggregation. Table-2 presents coefficient estimates of the variables included in our model for selected HS-2 level product categories.

*<Insert Table 2 here>*

[6] Results obtained from using aggregate U.S. imports (manufactured and non-manufactured goods and their corresponding SITC-1 digit level product classification), while less detailed and different from one-another, do not contradict the observation from HS-2 level dis-aggregation reported and discussed here. Corresponding results for aggregate and SITC-1 digit level classification and all other HS-2 level product not reported here can be obtained from the authors.

Higher log-likelihood and significant Chi-square values reported at bottom of each column corresponding to each HS-2 product indicate that the estimated model fits the data very well. Using results for commodities in HS-09 (Coffee, Tea, Mat & Spices), HS-61 (Apparel articles and accessories, knit or crochet), and HS-62 (Apparel articles and accessories, not knit etc.) categories, for example, we observe that most of the coefficients bear the expected signs.[7] Accordingly, for Coffee, Tea and Spices and Apparel articles, a one percent increase in the geographic distance results in a comparable 0.43 percent fall in U.S. imports of both product categories from each SSA country, while the same would reduce U.S. imports of not knit Apparel articles by 0.95 percent, plausibly as a result of differences in bulkiness of the products under consideration. Increased depreciation rate of a SSA country's currency vis-à-vis the U.S. dollar by one percent correspond to increased U.S. imports of Coffee, Tea and Spices by 0.29 percent, muted effect on U.S. imports of knit Apparel articles, and a 0.11 percent increase in U.S. imports of non-knit Apparel articles.

With increases in the average income of each SSA country, we observe increases in U.S. imports amount to 0.56 percent and 0.26 percent for knit and non-knit Apparel articles, respectively; both of the coefficients are less than unity as predicted by the theoretical gravity model and empirical studies that employ gravity model in examining determinants of bilateral trade flows (See, for example, White, 2007, and Combes, et al, 2005).

[7] Given that we employ Tobit specification for our estimations, the resulting coefficients are not true elasticities. However, as the corresponding proportionality coefficient estimates for each product are small relative to the median export levels of each SSA country, we heuristically interpret the coefficients as elasticity estimates following Tadesse and White (2007) and Head and Reis (1998).

We also observe significantly higher U.S. imports of products in each of the HS-09, HS-61, HS-62 categories, and several other products reported in Table-2 from SSA countries where English is commonly used. Intuitively, this implies that common language facilitates transactions. While we observe that U.S. imports from SSA countries that are landlocked are significantly lower than those that have coastal access, we also find a rise in the volume of U.S. imports from the specific SSA country with a rise in the economic openness of each country, indicative of the impact of the natural infrastructure and trade policy.

As hypothesized, the coefficient estimate of the stock of immigrant population is positive and significant for some products (e.g., both for Coffee, Tea and Spices and knit Apparel articles (products with inelastic demand for which immigrants often fail to find desirable substitutes) conforming to the pro-trade effects of immigrants, often reported in the trade-immigration literature. We also observe negative coefficient estimates of the stock of immigrants in few instances. Intuitively, this could result either from the availability of desirable substitutes for the specific goods under consideration, or changes in U.S. economic policies against often unfriendly regimes and politically unstable governments during certain years which may end up sending significantly larger immigrant population to the U.S. as refugees.

Results of two other variables (namely, $YREXPi_{jt}$, years elapsed since exporting of the first product(s) under AGOA from each SSA country took place, and $M^{K}_{ijt-1}$, the lag of the dependent variable) attract attention warranting further discussion. In the three product categories we selected for sample discussion (Coffee, Tea and Spices, and knit and non-knit Apparel Articles) and almost all other products as well, the coefficients of both

variables are significant and positive, their magnitudes exceeding that of most other variables in the model (e.g., for Coffee, Tea and Spices, 1.57 and 0.70; for knit Apparel Articles, 2.06 and 0. 69, and for non-knit Apparel Articles, 2.44 and 0.85). While the significance of the lag of the dependent variable is indicative of the persistence of SSA country's trade inertia with the U.S., that of *YREXP* informs us that an additional year of exporting experience under AGOA enhances exports from the particular country by a magnitude ranging from 1.6 percent for Coffee, Tea and Spices to 2.44 percent for non-knit Apparel Articles. The straightforward implication is that, over time, experience gained from trading eligible product (s) tends to increase each country's utilization of the benefits stipulated by the Act.

While increased population size of an AGOA eligible SSA country positively relate, in some instances, with greater U.S. imports from each country, each of the SSA country's exports of many of the HS-2 products does not appear to be sensitive to changes in the U.S. GDP, or population levels. We can, thus, assert that U.S. income, or population size, or wealth effect does not appear to exert discernable impact on U.S. imports from AGOA eligible SSA countries, although larger (in terms of population as well as GDP) AGOA eligible SSA economies tend to trade more with the United States.

Turning to our variable of interest, AGOA and focusing on its marginal effect, we find that the coefficient is positive and significant across many of the product classifications considered even after controlling for standard factors that are theoretically thought to affect bilateral trade flows, implying that the implementation of the Act has enhanced U.S imports from SSA countries. Again, using the three products we have selected above as an example, we can say that, on average 5.2 percent of each SSA

country's exports of Coffee, Tea and Spices, 43.5 percent and 16.02 percent of the increase in the knit and non-knit Apparel articles, respectively can be attributed to the implementation of AGOA. Our results, specifically for Apparel articles, are comparable with the findings in Frazer and Van Biesebroeck (2007) that use the triple difference-in-difference method for evaluating the impact of AGOA on U.S. imports from SSA countries. [8]

### 4. 3. The Trade Initiation and Intensification Effects of AGOA

Taken collectively, the results from both the aggregate (total non-manufactured and manufactured) U.S. imports, the corresponding SITC-1 digit level product classifications (all not reported here for brevity), and the HS-2 level product dis-aggregation reported in Table 3 indicate that, while AGOA did not bring statistically significant changes in aggregate as well as non-manufactured goods imports from SSA countries, it has resulted in significant increase in U.S. imports of manufactured goods imports from the countries eligible for benefit under the Act.[9] This is also consistent with the fact that under the Act, different products (for example, apparel and non-apparel items) have separate details of implementation.

Our inability to observe a significant coefficient for the AGOA dummy variable for some products, however, doesn't necessarily imply that the implementation of the Act had

[8] To check the sensitivity of our results, we drop South Africa from the data and run our estimations. Despite the significance of South Africa's exports in total SSA exports to the U.S., the results particularly on the effect of AGOA, did not appear to differ from those reported here.

[9] Note that while we do not observe statistically significant increase in the aggregate and non-manufactured goods U.S. imports from SSA countries, we find significant increase in the initiation of some level of imports for aggregate as well as non-manufactured goods. Regression results indicating these findings are available from the authors.

no effect on U.S. imports of the particular product(s) under consideration. Differences in the details of implementation of the Act across products, for example, may force some countries to substitute exports of certain goods that are subject to restrictions with exports of products or goods originating from other sectors covered by the concession. Given the disparities in the economic sizes of the AGOA eligible SSA countries, the variation in the basis of each country's comparative advantage for trade with the U.S. and the composition of the products that each of the SSA country might export to the U.S. under the Act, substitution effect among products is particularly likely and possible. One or more of the following questions may thus arise. Which countries and which products in each country have benefited most from AGOA? Has the implementation of the Act contributed to the initiation of exports in goods that were not previously exported? Did the implementation of the initiative result in increased level of goods that were being traded? While answering such important questions require substantial information for each product as defined in the Act on country by country basis, thus prohibiting us from making an inference on the first question, below we address the remaining two questions as our empirical model permits to disentangle the trade initiation and intensification effects of the implementation of the Act for each of the 99 different HS-2 digit level product classification.

*<Insert Table 3 here>*

A product specific summary of the effects of AGOA on U.S. imports, estimated by decomposing the marginal effects of AGOA into trade-initiation and intensification effects, reported in Tables 2a-b are presented in Table-3 together with the pre-and post-AGOA

average annual U.S. imports of each HS-2 product. A comparison of the pre-and post-AGOA average annual values based on the results presented in Table 3 reveals a significant rise in the volume of U.S. imports in 23 of the 99 products sub-categories and a fall in the volume of a few product categories. Apparel articles (both knit and not knit) account for a dominant proportion of SSA countries' exports where we observe significant post-AGOA increase in the volume of U.S. imports.

The last two columns of Table 3 present the trade initiation and intensification effects that could be attributed to the implementation of AGOA. The computed effects in both columns essentially correspond to the coefficients reported in Tables 2. The difference between those in Tables 2 and 3 is that the values in the former table are unconditional marginal effects while those in the latter table are computed by decomposing the marginal effect into changes from 0 to positive value, and subject to positive trade values, the changes in the volume of U.S. imports that could be attributed to the implementation of AGOA. Accordingly, the estimates presented in Table 3 indicate that AGOA has had significant trade initiation effects across 24 product sub-categories, while it has resulted in both trade initiation and intensification effects only in limited number of products.

Among other interesting observations that could be made from the results in the table, we find that the implementation of the AGOA has generated new exports in several product categories even among those products that account for economically a small proportion of SSA countries' exports to the U.S. For some product categories, we also find an outcome where the significant increase in the U.S. imports from SSA countries can not be attributed to the implementation of the Act. Yet in other products categories, while we observe a significant trade-initiation effect, the changes are not large enough to intensify

the level of SSA exports, implying that further enhancing SSA exports into the U.S. markets requires, not only building upon the trade-initiation momentum generated by the unilateral policy change, but also solving other impediments to SSA export industries. These may include building networked communications and efficient transportation hubs that enable SSA countries to overcome the negative of effect of geographic distance and lack of access to a seaport, training and capacity building (as could be inferred from the positive coefficients of income and experience under AGOA), and promoting their openness both in their product and foreign exchange markets.

## IV. Conclusions

Policy changes due to trade agreement may not only help raise the volume trade in goods that are already being traded, but also in the start-up of commerce in goods that were not previously traded between parties to such agreements. In this paper, we investigate whether there are changes in the volume of U.S. imports of several goods from SSA countries, and if the changes can be attributed to the implementation of AGOA, a unilateral trade policy initiative designed to eliminate trade barriers on exports of several, but selected products from eligible SSA countries. The results from our study show that the Act has enhanced the propensity of U.S. imports from eligible SSA countries by initiating imports in several sectors and product categories. Compared to the trade initiation effects it has had, the impact of the initiative in raising the volume of U.S. imports from eligible SSA countries has, however, remained minimal. Our findings imply that the success of AGOA in further increasing SSA exports to the U.S. markets depends on the ability of

African policy makers to build on the trade-initiation momentum generated by the Act. These may include building networked communications and efficient transportation hubs that enable SSA countries to overcome the negative of effect of geographic distance and lack of access to a seaport, training and capacity building (as could be inferred from the positive coefficients of income and experience under AGOA), and promoting their openness both in their product and foreign exchange markets.

While we explicitly bring to light the contribution of the implementation of the Act on aggregate and HS-2 digit level U.S. imports of different products from eligible SSA countries in general, the inadequacy of extensive product by country trade data limits our analysis from differentiating which products in which countries have benefited the most from the implementation of the Act. With the passage of time and the availability of sufficient cross-section and time series data for each product, future research using the same approach may focus on the identification of the same effects on product by country basis.

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Table-1: Pre- and Post AGOA Average Annual US Imports from Eligible SSA Countries

| Country | Pre-AGOA | | | Post-AGOA | | |
|---|---|---|---|---|---|---|
| | N | Mean(St.Dev) | %(Total) | N | Mean(St.Dev) | %(Total) |
| Angola | 13 | 8,708.51 (2,315.14) | 0.02 | 3 | 45,206.51 (16,691.56)*** | 0.11 |
| Benin | 10 | 3,608.82 (4,977.85) | 0.15 | 6 | 827 (404.39) | 0.01 |
| Botswana | 10 | 17,938.57 (6,456.25) | 0.30 | 6 | 87,608.24 (85,338.39)*** | 0.35 |
| Burkina Faso | 14 | 1,739.53 (1,614.42) | 0.04 | 2 | 1,161.94 (644.55) | 0.01 |
| Burundi | 15 | 6,728.5 (5,244.43) | 0.28 | 1 | 1,310.23 (785.72)*** | 0.03 |
| Cameroon | 10 | 21,654.99 (8,357.95) | 0.90 | 6 | 41,352.71 (14,813.98)*** | 0.86 |
| Cape Verde | 10 | 204.99 (161.79) | 0.01 | 6 | 2,367.92 (1,585.27)*** | 0.05 |
| Chad | 10 | 3,758.61 (3,028.15) | 0.15 | 6 | 10,389.67 (8,688.93) | 0.18 |
| Republic of Congo | 10 | 2,574.64 (2,865.73) | 0.08 | 6 | 1,243.67(0) | 0.01 |
| Democratic Repubic of Congo | 12 | 18,430.52 (8,380.26) | 0.32 | 4 | 18,277.64 (6,863.97) | 0.16 |
| Djibouti | 10 | 96.57 (178.96) | 0.00 | 6 | 1,465.83 (993.76)*** | 0.01 |
| Equatoria Guinea | 10 | 110,000 (11,934.24) | 4.34 | 6 | 72,858.38 (19,250.28)*** | 1.38 |
| Ethiopia | 10 | 32,923.53 (21,905.01) | 1.41 | 6 | 42,034.41 (1,973.15) | 0.85 |
| Gabon | 10 | 6,543.87(1,234.98) | 0.27 | 6 | 7,458.34(1,546.78) | 0.30 |
| Gambia | 12 | 3,629.64 (2,076.06) | 0.13 | 4 | 3,512.53 (2,049.74) | 0.05 |
| Ghana | 10 | 160,000 (38,059.37) | 2.51 | 6 | 99,859.87 (38,934.3)** | 1.99 |
| Guinea-Bissau | 10 | 77.45 (75.06) | 0.00 | 6 | 204.94 (214.84) | 0.00 |
| Kenya | 10 | 98,092.29 (14,471.88) | 3.98 | 6 | 230,000 (110,000)*** | 5.14 |
| Lesotho | 10 | 74,573.98 (21,714.02) | 3.28 | 6 | 320,000 (120,000)*** | 7.10 |
| Madagascar | 10 | 69,804.44 (35,007.35) | 3.03 | 6 | 300,000 (110,000)*** | 6.77 |
| Malawi | 10 | 62,884.25 (12,807.26) | 2.77 | 6 | 68,858.5 (23,389.33) | 1.56 |
| Mali | 10 | 4,174.88 (2,499.7) | 0.11 | 6 | 4,799.66 (2,871.46) | 0.05 |
| Mauritius | 10 | 220,000 (41,844.62) | 9.39 | 6 | 240,000 (68,073.81) | 5.20 |
| Mozambique | 10 | 6,453.21(2,341) | 0.31 | 6 | 7,689.40(2,345.00) | 0.30 |
| Namibia | 10 | 30,637.21 (16,242.5) | 1.24 | 6 | 110,000 (64,563.86) | 2.36 |
| Niger | 10 | 5,863.78 (9,746.05) | 0.23 | 6 | 4,871.68 (3,793.31) | 0.05 |
| Nigeria | 10 | 49,218.39 (19,510.24) | 1.90 | 6 | 48,858.19 (27,240.12) | 0.73 |
| Rwanda | 10 | 4,110.58 (2,186.09) | 0.18 | 6 | 5,499.85 (2,044.57) | 0.12 |
| Sao Tome and Principe | 10 | 224.74 (484.12) | 0.01 | 6 | 2.87 (7) | 0.00 |
| Senegal | 10 | 6,628.47 (1,725.96) | 0.20 | 6 | 19,176.92 (34,683.01) | 0.16 |
| Seychelles | 10 | 2,904.97 (1,300.72) | 0.06 | 6 | 11,548.68 (8,514.66)*** | 0.23 |
| Sierra Leone | 12 | 17,882.91 (14,773.58) | 0.57 | 4 | 72,386.42 (31,552.91)*** | 1.63 |
| South Africa | 10 | 2,300,000 (530,000) | 56.37 | 6 | 5,100,000 (1,200,000)*** | 57.66 |
| Swaziland | 10 | 31,372.27 (7,956.99) | 1.35 | 6 | 130,000 (60,138.42)*** | 2.88 |
| Tanzania | 10 | 21,488.72 (9,159.89) | 0.66 | 6 | 28,113.04 (4,686.95) | 0.38 |
| Uganda | 10 | 19,867.62 (10,627.1) | 0.86 | 6 | 22,980.11 (7,284.31) | 0.50 |
| Zambia | 10 | 51,561.02 (13,856.9) | 2.18 | 6 | 20,987.9 (9,160.72)*** | 0.43 |
| ALL AGOA Eligibel Countries | 388 | 92,938.73 (380,000) | 100 | 204 | 220,000 (900,000) | 100 |

***, *** and * denote significant differences between the Pre- and Post-AGOA average annual exports of the specific country at $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively; trade values reported here exclude exports of Commodities in HS-27 (petroleum products) and HS-71 (pearls and natural stone) ; The mean (St. Dev.) of the variables for all countries included in the analysis are as follows: RGDP(in billions): 8.5(220.66); Population (in millions): 14.03( 22,000); Distance from NY (in KM):6,892.69(2,316); GDP Deflator: 92.9 (21.6); Stock of Immigrants (per country in 000s): 77.754(1,669.7); Usage of English as Common language: 0.26(0.44); Landlocked: 0.37(0.48); Index of openness: 31.38(21.35); Average number of Years since exporting first product under AGOA: 3.09 (1.37)

Table 2a: Determinants of Selected US Imports from AGOA Eligible SSA Countries by HS-2 Product Classification, Tobit Estimates (Undecomposed Marginal Effects)

| Dep. Var. ==> | HS-03 | HS-04 | HS-05 | HS-07 | HS-09 | HS-10 | HS-11 | HS-15 | HS-19 | HS-21 | HS-22 | HS-30 | HS-31 | HS-33 | HS-37 | HS-38 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ln $DIST_{ijt}$ | -0.500 | 0.063 | -0.829 | -0.322 | -0.427 | -0.036 | -0.443 | 0.954 | -0.489 | -0.591 | -1.058 | -0.540 | -0.231 | 0.735 | -0.236 | 0.352 |
| | (2.74)*** | (0.32) | (2.25)** | (2.56)*** | (4.42)*** | (0.28) | (1.56) | (1.48) | (2.67)*** | (2.08)** | (1.96)* | (2.67)*** | (1.55) | (1.17) | (1.08) | (0.87) |
| $AGOA_{it}$ | 0.495 | -0.170 | -0.111 | 0.524 | 1.622 | 0.054 | 0.296 | 1.504 | 0.275 | 2.105 | 1.202 | 0.019 | -2.120 | 0.546 | 3.263 | 2.783 |
| | (0.52) | (1.87)* | (2.28)** | (1.88)* | (3.66)*** | (0.49) | (1.04) | (2.72)*** | (1.46) | (2.40)** | (1.99)** | (0.11) | (0.98) | (1.76)* | (1.11) | (1.57) |
| ln $GDP_{it}$ | 0.027 | 0.101 | 0.603 | 0.058 | 1.067 | 0.087 | -0.195 | -0.584 | 0.227 | 0.194 | 0.666 | 0.211 | 0.125 | 0.097 | 0.214 | 0.318 |
| | (2.89)*** | (1.48) | (4.26)*** | (0.28) | (1.20) | (2.22)** | (2.14)** | (2.56)** | (3.65)*** | (2.00)** | (3.29)*** | (3.26)*** | (2.50)** | (0.43) | (2.75)*** | (2.15)** |
| ln $POP_{it}$ | -0.353 | -0.050 | -0.055 | 0.325 | 1.574 | -0.034 | 0.251 | 0.584 | -0.108 | 0.231 | -0.455 | 0.016 | -0.064 | 0.421 | -0.018 | -0.078 |
| | (1.18) | (0.73) | (0.48) | (1.62) | (4.52)*** | (0.87) | (2.81)*** | (2.58)*** | (2.01)** | (2.44)** | (2.57)** | (0.30) | (1.55) | (1.93)* | (0.29) | (0.63) |
| ln $GDEF_{jt}$ | -1.297 | -0.171 | -1.187 | 0.038 | -0.583 | -0.178 | -0.394 | -1.347 | -0.125 | -0.162 | -0.193 | 0.067 | 0.027 | 0.938 | -0.065 | -0.373 |
| | (1.16) | (0.86) | (2.81)*** | (0.06) | (0.54) | (1.47) | (2.46)** | (1.95)* | (0.78) | (0.59) | (2.32)** | (0.39) | (0.16) | (1.31) | (0.26) | (0.81) |
| $EXRT_{ijt}$ | 0.343 | 0.021 | -0.020 | 0.012 | 0.293 | 0.012 | 0.016 | 0.097 | 0.006 | 0.003 | 0.087 | 0.026 | -0.030 | 0.137 | -0.060 | -0.017 |
| | (3.13)*** | (0.94) | (0.49) | (0.18) | (2.65)*** | (0.89) | (0.57) | (1.35) | (0.32) | (0.11) | (1.34) | (1.38) | (1.81)* | (1.85)* | (2.39)** | (0.37) |
| ln $GDP_{jt}$ | 0.511 | -0.011 | -0.986 | 1.760 | -0.732 | -0.489 | 0.845 | -0.391 | -0.885 | -0.536 | -1.368 | -0.182 | 0.103 | -0.987 | 1.335 | -1.267 |
| | (0.10) | (0.90) | (0.87) | (2.36)** | (0.87) | (0.93) | (0.67) | (0.53) | (1.75)* | (0.75) | (0.87) | (0.63) | (1.19) | (1.59) | (0.25) | (2.94)*** |
| ln $POP_{jt}$ | -1.067 | 2.058 | 0.153 | 1.114 | 1.852 | 7.771 | -1.817 | 1.602 | 3.712 | 2.935 | 2.541 | 0.317 | -0.610 | 1.846 | -0.623 | 1.272 |
| | (0.22) | (1.62) | (1.00) | (1.57) | (1.25) | (0.51) | (0.53) | (0.18) | (2.10)** | (0.94) | (0.39) | (1.01) | (0.99) | (1.40) | (1.67)* | (2.91)*** |
| ln $GDEF_{jt}$ | 7.987 | -1.851 | -1.045 | -3.130 | -4.049 | -0.696 | 1.808 | 1.552 | -1.355 | -9.950 | -3.024 | -7.084 | 4.293 | -1.340 | 6.934 | -3.334 |
| | (0.19) | (2.12)** | (1.19) | (1.56) | (1.58) | (0.16) | (0.18) | (0.06) | (2.20)** | (0.95) | (0.14) | (1.17) | (0.73) | (1.19) | (0.79) | (2.69)*** |
| ln $IMM_{ijt}$ | 0.056 | 0.065 | 0.029 | 0.316 | 0.615 | 0.034 | 0.127 | 0.557 | 0.049 | -0.026 | 0.220 | 0.073 | 0.015 | 0.260 | -0.048 | -0.020 |
| | (0.31) | (1.66)* | (0.36) | (2.56)** | (3.01)*** | (1.65)* | (2.45)** | (3.85)*** | (1.57) | (0.45) | (2.12)** | (1.85)* | (0.61) | (1.94)* | (1.17) | (0.24) |
| $ENG_i$ | 1.806 | 0.132 | 0.563 | -0.178 | 1.052 | 0.095 | 0.268 | 0.491 | 0.089 | 0.239 | 0.406 | 0.104 | 0.090 | -0.312 | 0.043 | 0.031 |
| | (2.69)*** | (1.04) | (2.21)** | (0.48) | (1.67)* | (1.54) | (1.80)* | (1.23) | (0.83) | (1.19) | (1.19) | (0.83) | (0.94) | (2.80)*** | (0.33) | (0.12) |
| $LLOCKED_i$ | -2.699 | 0.180 | -0.447 | -0.098 | -0.205 | -0.021 | -0.303 | -1.114 | -0.086 | -0.434 | -0.013 | -0.095 | -0.093 | -0.375 | -0.089 | -0.295 |
| | (4.67)*** | (1.44) | (2.25)** | (0.27) | (0.35) | (0.29) | (2.01)** | (2.88)*** | (0.92) | (2.85)*** | (0.04) | (1.02) | (1.15) | (1.02) | (0.76) | (1.31) |
| ln $OPEN_{it}$ | -0.020 | 0.001 | -0.006 | 0.015 | 0.020 | 0.000 | 0.015 | 0.028 | 0.003 | 0.011 | 0.004 | 0.003 | -0.002 | 0.029 | -0.001 | 0.000 |
| | (1.46) | (0.17) | (1.16) | (1.52) | (1.64)* | (0.13) | (3.30)*** | (2.62)*** | (1.37) | (2.47)** | (0.61) | (1.22) | (0.91) | (3.01)*** | (0.22) | (0.05) |
| $YREXP_{it}$ | -1.245 | 0.419 | 0.307 | 0.899 | 1.577 | -0.036 | 1.041 | 1.682 | 0.395 | 1.345 | 1.382 | 0.719 | 0.101 | 2.504 | 0.523 | 1.315 |
| | (1.35) | (1.60) | (0.75) | (1.43) | (2.55)** | (0.32) | (2.82)*** | (2.27)** | (1.84)* | (3.73)*** | (2.00)** | (2.86)*** | (0.67) | (3.14)*** | (1.82)* | (2.44)** |
| $LAGDEP_{it}$ | 0.650 | 0.047 | 0.080 | 0.267 | 0.703 | 0.019 | 0.092 | 0.349 | 0.032 | 0.063 | 0.195 | 0.027 | 0.028 | 0.233 | 0.040 | 0.099 |
| | (13.71)*** | (4.57)*** | (3.92)*** | (8.98)*** | (16.25)*** | (2.85)*** | (6.68)*** | (10.88)*** | (3.56)*** | (4.33)*** | (7.26)*** | (3.27)*** | (4.19)*** | (7.52)*** | (3.21)*** | (4.76)*** |
| Constant | 512.59 | -698.35 | -873.44 | -2179.14 | -2928.08 | -119.06 | 293.24 | -254.6 | -643.35 | -543.9 | -423.71 | -334.92 | 336.37 | -2044.45 | 353.41 | -2703.19 |
| | (0.22) | (1.64) | (1.00) | (1.58) | (1.28) | (0.48) | (0.53) | (0.17) | (2.09)** | (0.94) | (0.34) | (1.02) | (0.98) | (1.39) | (0.70) | (2.88)*** |
| Observations | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 |
| McFadden $R^2$ | 0.17 | 0.19 | 0.22 | 0.17 | 0.23 | 0.23 | 0.23 | 0.20 | 0.27 | 0.26 | 0.18 | 0.21 | 0.25 | 0.16 | 0.19 | 0.15 |
| Chi-square | 1,166*** | 1,179*** | 1,182*** | 979*** | 979*** | 981*** | 400*** | 439*** | 462*** | 228*** | 237*** | 242*** | 282*** | 284*** | 297*** | 1,320*** |
| Log-likelihood ratio | -2,254.1 | -2,247.5 | -2,245.9 | -2,265.6 | -2,265.6 | -2,264.8 | -2,400.8 | -2,381.3 | -2,370.0 | -2,716.2 | -2,711.8 | -2,709.0 | -2,576.3 | -2,575.4 | -2,569.0 | -2,170.5 |
| Country Fixed Effects | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included |
| Time Fixed Effects | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included |

Absolute value of z statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

See Table-3 for the description of each of the HS-2 product categories used as dependent varibale.

Table 2b: Determinants of Selected US Imports from AGOA Eligible SSA Countries by HS-2 Product Classification, Tobit Estimates (Undecomposed Marginal Effects)

| Dep. Var. ==> | HS-39 | HS-40 | HS-44 | HS-52 | HS-57 | HS-60 | HS-61 | HS-62 | HS-76 | HS-83 | HS-85 | HS-86 | HS-87 | HS-95 | HS-97 | HS-98 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ln $DIST_{ijt}$ | 0.417 | -2.289 | -0.490 | -3.243 | -0.437 | -0.621 | -0.435 | -0.948 | -0.270 | -1.617 | -2.733 | -0.009 | -1.199 | -0.015 | -2.011 | -1.352 |
| | (0.54) | (3.07)*** | (0.61) | (4.14)*** | (0.99) | (2.20)** | (1.83)* | (1.65)* | (0.70) | (2.65)*** | (2.91)*** | (0.23) | (2.09)** | (0.02) | (2.52)** | (2.04)** |
| $AGOA_{it}$ | 2.035 | 1.659 | 0.435 | 2.570 | -0.155 | 3.457 | 2.774 | 0.342 | 2.519 | -0.491 | 1.916 | 0.168 | 2.241 | 0.164 | -0.131 | 0.533 |
| | (2.21)** | (1.96)** | (2.48)** | (0.70) | (3.34)*** | (1.83)* | (3.78)*** | (2.38)** | (1.21) | (0.82) | (1.90)* | (2.20)** | (0.39) | (0.20) | (0.15) | (0.73) |
| ln $GDP_{it}$ | 0.470 | 0.219 | 0.192 | 0.387 | 0.484 | 0.174 | 0.564 | 0.266 | 0.172 | 0.476 | 1.686 | 0.052 | 0.459 | 0.842 | 0.644 | 1.275 |
| | (1.54) | (0.83) | (0.63) | (1.34) | (2.87)*** | (1.83)* | (1.65)* | (1.84)* | (1.29) | (2.18)** | (4.57)*** | (3.56)*** | (2.16)** | (2.90)*** | (2.13)** | (4.71)*** |
| ln $POP_{it}$ | 0.091 | 0.334 | 0.796 | 0.675 | 0.046 | 0.074 | -0.139 | 0.080 | -0.016 | -0.103 | -0.570 | -0.008 | -0.165 | -0.029 | 0.811 | -0.065 |
| | (0.35) | (1.35) | (2.89)*** | (2.55)** | (0.30) | (0.85) | (0.43) | (0.28) | (0.13) | (0.52) | (1.77)* | (0.64) | (0.95) | (0.12) | (2.93)*** | (0.28) |
| ln $GDEF_{jt}$ | 0.741 | -0.541 | 0.318 | 0.563 | -0.776 | -0.656 | -0.937 | -0.063 | -0.601 | -0.405 | -0.712 | 0.035 | 0.207 | -0.251 | -2.019 | 0.237 |
| | (0.79) | (1.63)* | (0.32) | (0.63) | (1.52) | (2.16)** | (1.83)* | (0.06) | (1.38) | (0.64) | (0.61) | (0.88) | (0.34) | (0.28) | (2.03)** | (0.28) |
| $EXRT_{ijt}$ | -0.144 | -0.139 | 0.029 | -0.018 | -0.101 | -0.045 | -0.104 | 0.110 | -0.061 | -0.042 | -0.267 | -0.002 | -0.043 | 0.089 | -0.124 | -0.168 |
| | (1.50) | (1.61) | (0.30) | (2.20)** | (1.86)* | (1.56) | (0.88) | (1.93)** | (1.42) | (0.60) | (2.26)** | (0.46) | (0.67) | (0.99) | (1.26) | (1.97)** |
| ln $GDP_{jt}$ | -1.826 | -3.916 | 0.494 | 0.876 | 0.276 | 0.214 | 1.291 | 0.377 | -0.738 | 0.398 | -1.386 | -1.952 | 0.307 | 1.341 | 1.844 | 0.006 |
| | (0.63) | (2.11)** | (0.44) | (1.19) | (0.21) | (0.67) | (1.02) | (0.24) | (0.49) | (1.59) | (0.70) | (2.26)** | (0.02) | (0.59) | (0.55) | (0.38) |
| ln $POP_{jt}$ | -4.511 | 1.368 | -1.384 | 1.515 | -1.241 | 1.366 | -1.308 | -0.785 | 0.304 | 1.518 | -2.721 | 9.075 | 6.711 | 4.832 | -0.923 | 0.342 |
| | (0.41) | (1.33) | (0.56) | (2.48)** | (0.18) | (0.40) | (1.13) | (1.72)* | (2.01)** | (1.83)* | (0.19) | (1.98)** | (0.09) | (2.57)** | (1.70)* | (0.00) |
| ln $GDEF_{jt}$ | 4.560 | -1.422 | 1.340 | -1.639 | 1.965 | -2.091 | 0.008 | 24.833 | 3.029 | -2.294 | 4.282 | -2.243 | -3.514 | -1.861 | 0.104 | -0.836 |
| | (1.29) | (0.68) | (0.47) | (1.83)* | (0.11) | (0.19) | (1.86)* | (0.64) | (0.19) | (1.76)* | (1.04) | (1.77)* | (0.16) | (0.57) | (0.81) | (2.31)** |
| ln $IMM_{ijt}$ | 0.192 | 0.057 | -0.106 | -0.184 | 0.223 | 0.006 | 0.355 | 0.141 | 0.061 | 0.205 | -0.171 | -0.004 | 0.035 | 0.160 | -0.308 | 0.042 |
| | (1.16) | (0.39) | (0.63) | (1.19) | (2.54)** | (0.11) | (1.76)* | (0.81) | (0.82) | (1.72)* | (0.89) | (0.45) | (0.32) | (1.00) | (1.85)* | (0.30) |
| $ENG_i$ | -0.768 | 0.121 | 1.086 | -0.091 | 0.555 | 0.163 | 1.034 | 0.109 | 0.209 | -0.071 | 0.519 | -0.007 | -0.215 | -0.294 | 1.411 | 0.824 |
| | (1.47) | (2.25)** | (1.91)* | (0.17) | (1.83)* | (0.86) | (2.59)*** | (2.18)** | (0.83) | (0.18) | (0.77) | (0.33) | (0.62) | (0.59) | (2.47)** | (1.67)* |
| $LLOCKED_i$ | 0.094 | -0.721 | -1.505 | -1.304 | 0.064 | -0.182 | 0.563 | -0.557 | -0.174 | 0.416 | -1.346 | -0.019 | -0.288 | -0.307 | -2.035 | -0.814 |
| | (0.19) | (1.66)* | (2.93)*** | (2.87)*** | (0.26) | (1.19) | (0.94) | (1.85)* | (0.79) | (1.13) | (2.28)** | (0.86) | (0.90) | (0.68) | (4.01)*** | (1.88)* |
| ln $OPEN_{it}$ | 0.007 | 0.036 | -0.002 | 0.014 | 0.006 | 0.002 | 0.028 | 0.016 | 0.004 | 0.015 | 0.024 | 0.000 | 0.003 | -0.007 | 0.006 | 0.035 |
| | (0.61) | (3.14)*** | (0.20) | (1.18) | (0.95) | (0.50) | (1.95)* | (2.23)** | (0.63) | (1.63) | (1.66)* | (0.42) | (0.41) | (0.63) | (0.49) | (3.23)*** |
| $YREXP_{it}$ | 4.497 | 2.477 | 4.855 | 3.075 | 1.084 | 0.388 | 2.063 | 2.440 | 0.938 | 2.626 | 0.191 | 0.068 | 2.356 | 3.899 | 4.402 | 1.185 |
| | (4.32)*** | (2.82)*** | (4.91)*** | (3.66)*** | (2.12)** | (1.35) | (2.00)** | (2.66)*** | (2.06)** | (3.46)*** | (0.19) | (1.31) | (3.23)*** | (4.25)*** | (4.84)*** | (1.63) |
| $LAGDEP_{it}$ | 0.401 | 0.414 | 0.692 | 0.424 | 0.229 | 0.068 | 0.687 | 0.853 | 0.115 | 0.206 | 0.406 | 0.002 | 0.186 | 0.449 | 0.509 | 0.318 |
| | (9.42)*** | (11.94)*** | (14.66)*** | (10.30)*** | (8.58)*** | (3.99)*** | (16.25)*** | (20.93)*** | (6.21)*** | (6.49)*** | (7.97)*** | (1.24) | (7.07)*** | (10.31)*** | (10.32)*** | (6.90)*** |
| Constant | 864.11 | -2249.4 | 1181.12 | -2765.83 | 186.09 | -223.24 | 2625.68 | 1179.06 | 33.66 | -2465.59 | 550.37 | -144.33 | -112.8 | -1053.38 | 1442.42 | 37.05 |
| | (0.44) | (1.27) | (0.57) | (1.46) | (0.18) | (0.38) | (1.11) | (0.54) | (0.04) | (1.83)* | (0.23) | (1.94)* | (0.09) | (0.57) | (0.70) | (0.02) |
| Observations | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 560 | 524 | 524 | 524 |
| McFadden $R^2$ | 0.14 | 0.18 | 0.19 | 0.17 | 0.17 | 0.18 | 0.16 | 0.17 | 0.19 | 0.14 | 0.09 | 0.31 | 0.15 | 0.16 | 0.15 | 0.11 |
| Chi-square | 1,323*** | 1,325*** | 601*** | 611*** | 642*** | 534*** | 539*** | 564*** | 387*** | 387*** | 389*** | 273*** | 274*** | 288*** | 929*** | 654*** |
| Log-likelihood ratio | -2,168.8 | -2,167.8 | -2,280.6 | -2,275.7 | -2,260.3 | -2,169.5 | -2,167.0 | -2,154.8 | -2,539.5 | -2,539.5 | -2,538.6 | -2,793.2 | -2,793.0 | -2,786.0 | -1,197.0 | -1,017.0 |
| Country Fixed Effects | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included |
| Time Fixed Effects | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included | Included |

Absolute value of z statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

See Table-3 for the description of each of the HS-2 product categories used as dependent varibale.

Table-3: The Import Initiation and Inensification Effects of AGOA on U.S. imports from Eligible SSA Countries by HS-2 Commodity Classication

| HS-2 Commodity Classification | Pre-AGOA US Imports from SSA Countries (N=304) | | Post-AGOAUS Imports from SSA Countries (N=256) | | | |
|---|---|---|---|---|---|---|
| | Mean(St.Dev) | % (Total) | Mean(St.Dev) | %(Total) | Import Initiation Effect | Import Intensification Effect |
| 01 Live Animals | 147.41 (367.36) | 0.24 | 335.52 (1,545.67) | 0.24 | 0.08455 (1.85)* | 0.514(1.85)* |
| 02 Meat and Edible Meat Offal | 1.72 (20.25) | 0.00 | 0 (0) | 0.00 | -0.03565 (0.52) | -0.351 (0.52) |
| 03 Fish, Crustaceans & Aquatic Invertebrates | 1,656.29 (6,076.83) | 2.69 | 1,855.66 (6,116.93) | 1.35 | -0.02904 (0.87) | -0.627(0.87) |
| 04 Dairy Products; Birds Eggs; Honey; Ed Animal Pr Nesoi | 71.68 (478.08) | 0.11 | 0.55 (2.61)*** | 0.00 | 0.02137 (1.08) | -0.144(2.28)** |
| 05 Products of Animal Origin, Nesoi | 66.1 (359.43) | 0.10 | 60.18 (307.53)** | 0.04 | -0.10555 (2.45)** | -0.730 (2.45)** |
| 06 Live Trees, Plants, Bulbs Etc.; Cut Flowers Etc. | 102.62 (491.21) | 0.16 | 192.29 (733.79) | 0.13 | -0.07621 (0.88) | -0.500(0.78) |
| 07 Edible Vegetables & Certain Roots & Tubers | 41.63 (189.21) | 0.07 | 110.97 (417.55)** | 0.08 | 1.06394 (2.33)** | 2.426(2.33)** |
| 08 Edible Fruit & Nuts; Citrus Fruit or Melon Peel | 735.54 (4,175.93) | 1.17 | 1,993.98 (10,132.04) | 1.42 | 0.04791 (0.56) | 1.440(2.66)*** |
| 09 Coffee, Tea, Mate & Spices | 3,477.16 (8,779.38) | 5.53 | 4,735.03 (7,472.15)** | 3.33 | 0.011(0.49) | 1.309(3.49)*** |
| 10 Cereals | 0.89 (6.74) | 0.00 | 4.71 (26.81)** | 0.00 | 0.059 (1.84)* | 0.563(1.04) |
| 11 Milling Products; Malt; Starch; Inulin; Wht Gluten | 9.31 (43.92) | 0.01 | 32.6 (116.4)*** | 0.02 | 0.262(2.84)*** | 1.525(2.74)*** |
| 12 Oil Seeds Etc.; Misc Grain, Seed, Fruit, Plant Etc | 251.36 (1069.36) | 0.39 | 548.25 (2,168.15) | 0.39 | 0.055(0.54) | -0.373 (0.64) |
| 13 Lac; Gums, Resins & Other Vegetable Sap & Extract | 599.24 (2652.87) | 0.95 | 555.23 (2,075.62) | 0.40 | 0.008(0.49) | 0.200 (0.49) |
| 14 Vegetable Plaiting Materials & Products Nesoi | 32.73 (176.18) | 0.05 | 20.72 (81.47) | 0.01 | -0.071(0.70) | 0.419 (0.72) |
| 15 Animal or Vegetable Fats, Oils Etc. & Waxes | 47.23 (165.5) | 0.07 | 163.23 (999.89)* | 0.11 | 0.026 (0.72) | 0.475 (0.72) |
| 16 Edible Preparations of Meat, Fish, Crustaceans Etc | 55.92 (446.12) | 0.09 | 195.21 (2,267.7) | 0.14 | 0.001 (0.05) | 0.025(0.05) |
| 17 Sugars and Sugar Confectionary | 1,163.18 (4,059.75) | 1.90 | 1007.6 (3,361.38) | 0.71 | -0.093(1.92)* | -0.836(1.92)* |
| 18 Cocoa and Cocoa Preparations | 1,148.5 (5,921.19) | 1.74 | 1,887.57 (8,555.82) | 1.35 | 0.066(1.46) | 0.723 (1.46) |
| 19 Prep Cereal, Flour, Starch or Milk; Bakers Wares | 2.69 (12.22) | 0.00 | 14.06 (49.55)*** | 0.01 | 0.210(2.74)*** | 1.401 (2.74)*** |
| 20 Prep Vegetables, Fruit, Nuts or Other Plant Parts | 546.13 (3311.4) | 0.87 | 746.61 (4,199.88) | 0.53 | -0.027 (0.40) | -0.182(0.40) |
| 21 Miscellaneous Edible Preparations | 58.99 (358.43) | 0.09 | 220.6 (957.11)** | 0.16 | 0.176 (1.99)** | 1.219 (1.99)** |
| 22 Beverages, Spirits and Vinegar | 153.91 (981.49) | 0.24 | 1,340.36 (8,113.67)** | 0.92 | 0.035(0.58) | 2.306(2.58)*** |
| 23 Food Industry Residues & Waste; Prep Animal Feed | 108.3 (469.13) | 0.17 | 212.1 (865.13) | 0.15 | -0.088 (1.31) | -0.866(1.41) |
| 24 Tobacco and Manufactured Tobacco Substitutes | 1,379.4 (7,928.49) | 2.21 | 1,408.74 (7,428.15) | 0.99 | 0.002 (1.23) | -0.022(0.03) |
| 25 Salt; Sulfur; Earth & Stone; Lime & Cement Plaster | 730.19 (3,939.34) | 1.15 | 698.67 (3,910.94) | 0.50 | 0.040 (0.56) | 0.370 (0.75) |
| 26 Ores, Slag and Ash | 9,338.19 (4,3477.32) | 14.69 | 10,527.11 (4,7576.95) | 7.79 | 0.002 (0.05) | 0.0386(0.55) |
| 28 Inorganic Chemical; Prec & Rare-earth Met & Radioact Compound | 1,942.8 (11,684.38) | 3.00 | 4,546.77 (2,2467.4) | 3.19 | 0.042 (0.42) | 0.426(0.62) |
| 29 Organic Chemicals | 1,394.8 (8,772.78) | 2.21 | 4,677.76 (2,6083.06) | 3.33 | 0.003(0.11) | 0.067(0.41) |
| 30 Pharmaceutical Products | 108.02 (1,410.82) | 0.17 | 127.28 (881.85) | 0.09 | 0.021(0.98) | 1.683(1.98)** |
| 31 Fertilizers | 190.3 (1,145.63) | 0.30 | 26.17 (164.16)** | 0.02 | 0.002(0.12) | -0.056 (0.12) |
| 32 Tanning & Dye Ext Etc; Dye, Paint, Putty Etc; Inks | 370.52 (2,145.78) | 0.58 | 596.04 (3,278.89) | 0.43 | 0.074(0.96) | 0.492 (0.76) |
| 33 Essential Oils Etc; Perfumery, Cosmetic Etc Preps | 69.43 (261.16) | 0.11 | 426.03 (2,057.7)*** | 0.30 | 1.056(1.93)** | -0.470(0.94) |
| 34 Soap Etc; Waxes, Polish Etc; Candles; Dental Preps | 25.54 (124.97) | 0.04 | 79.39 (378.96) | 0.06 | 0.069 (0.65) | 0.879(1.36) |
| 35 Albuminoidal Subst; Modified Starch; Glue; Enzymes | 54.66 (324.7) | 0.09 | 37.07 (203.15) | 0.03 | 0.001 (0.72) | 0.166 (0.72) |
| 36 Explosives; Pyrotechnics; Matches; Pyro Alloys Etc | 1.45 (13.2) | 0.00 | 38.18 (212.81)*** | 0.03 | 0.046 (1.11) | 0.722 (1.11) |
| 37 Photographic or Cinematographic Goods | 2.97 (15.09) | 0.00 | 73.7 (575.16)** | 0.05 | 0.108 (1.57) | 1.237 (1.57) |
| 38 Miscellaneous Chemical Products | 150.47 (1,066.41) | 0.24 | 872.48 (5,826.3) | 0.62 | 1.195 (2.21)** | 1.434(2.21)** |
| 39 Plastics and Articles Thereof | 184.07 (1,050.84) | 0.28 | 789.4 (4,125.41)** | 0.56 | 2.199(1.96)** | 0.248(1.96)** |
| 40 Rubber and Articles Thereof | 1,203.02 (4,693.44) | 1.90 | 2,809.98 (1,2987.58) | 1.98 | 0.163(1.61) | 0.975(0.48) |
| 41 Raw Hides and Skins (no Furskins) and Leather | 619.39 (33,22.25) | 0.98 | 605.67 (3,241.05) | 0.43 | 0.117 (1.51) | 0.840(1.51) |
| 42 Leather Art; Saddlery Etc; Handbags Etc; Gut Art | 60.91 (281.05) | 0.10 | 120.47 (600.07) | 0.09 | 0.088(1.41) | 0.654 (1.41) |
| 43 Furskins and Artificial Fur; Manufactures Thereof | 17.74 (64.94) | 0.03 | 26.21 (129.99) | 0.02 | 0.016(0.48) | 0.349 (0.48) |
| 44 Wood and Articles of Wood; Wood Charcoal | 721.75 (2474.04) | 1.14 | 2,394.86 (7,617.57)*** | 1.70 | 0.003(1.83)* | 0.180(0.23) |
| 45 Cork and Articles of Cork | 0.07 (0.78) | 0.00 | 0.51 (4.97) | 0.00 | -0.0506(0.53) | -0.260(0.53) |
| 46 Mfr of Straw, Esparto Etc.; Basketware & Wickerwrk | 33.52 (138.78) | 0.05 | 55.87 (162.5) | 0.04 | 0.004 (1.09) | 0.490(1.09) |
| 47 Wood Pulp Etc; Recovd (waste & Scrap) ppr & pprbd | 1,202.83 (7,097.64) | 1.90 | 964.42 (5,721.18) | 0.68 | 0.010(0.13) | 0.076 (0.13) |
| 48 Paper & Paperboard & Articles (inc Papr Pulp Artl) | 143.54 (1,026.26) | 0.22 | 126.44 (770.54) | 0.09 | 0.053(0.58) | 0.3796(0.58) |
| 49 Printed Books, Newspapers Etc; Manuscripts Etc | 36.09 (217.04) | 0.06 | 88.56 (450.06) | 0.06 | -0.029(0.97) | -0.482 (0.97) |
| 50 Silk, Including Yarns and Woven Fabric Thereof | 1.93 (13.22) | 0.00 | 1.14 (5.13) | 0.00 | -0.046 (1.45) | -0.895(1.45) |
| 51 Wool & Animal Hair, Including Yarn & Woven Fabric | 105.49 (660.11) | 0.17 | 141.86 (817.62) | 0.10 | 0.064(0.70) | 0.408 (0.70) |
| 52 Cotton, Including Yarn and Woven Fabric Thereof | 157.86 (734.88) | 0.41 | 176.23 (74.54)*** | 0.05 | 1.072(2.33)** | 2.749(2.33)** |
| 53 Veg Text Fib Nesoi; Veg Fib & Paper Yns & Wov Fab | 1.66 (9.65) | 0.00 | 3 (13.08) | 0.00 | -0.021(0.45) | -0.240(0.45) |
| 54 Manmade Filaments, Including Yarns & Woven Fabrics | 322.95 (1,961.96) | 0.51 | 267.14 (1,522.99) | 0.19 | -0.011(0.46) | -0.204 (0.46) |
| 55 Manmade Staple Fibers, Incl Yarns & Woven Fabrics | 37.31 (217.76) | 0.06 | 29.23 (171.25) | 0.02 | 0.026(0.64) | 0.417(0.64) |
| 56 Wadding, Felt Etc; Sp Yarn; Twine, Ropes Etc. | 64.58 (344.75) | 0.10 | 75.32 (432.76) | 0.05 | 0.027(0.34) | 0.163(0.34) |
| 57 Carpets and Other Textile Floor Coverings | 24.51 (171.69) | 0.04 | 106.13 (617.16)* | 0.08 | 0.127(1.80)* | 0.7833(1.60) |
| 58 Special Woven Fabrics; Tufted Fab; Lace; Tapestries Etc | 131.95 (820.21) | 0.21 | 200.21 (1,149.61) | 0.14 | 0.037(1.26) | 0.6581(1.26) |
| 59 Impregnated Etc Text Fabrics; Tex Art For Industry | 6.38 (45.32) | 0.01 | 65.19 (450.25) | 0.05 | 0.085 (1.43) | 0.849(1.43) |
| 60 Knitted or Crocheted Fabrics | 9.52 (81.85) | 0.02 | 53.07 (291.98) | 0.04 | 0.048 (3.78)*** | 0.556(3.78)*** |
| 61 Apparel Articles and Accessories, Knit or Crochet | 3,570.07 (11,313.76) | 5.69 | 17,891.46 (44,168.91)*** | 12.75 | 0.008(2.38)** | 3.289(2.38)** |
| 62 Apparel Articles and Accessories, Not Knit Etc. | 6,797.3 (23,709.77) | 10.74 | 18,260.96 (45,173.87)*** | 12.75 | 1.002 (1.84)* | 2.019(0.04) |
| 63 Textile Art Nesoi; Needlecraft Sets; Worn Text Art | 61.12 (274.24) | 0.10 | 129.2 (647.31) | 0.09 | 0.094 (1.03) | 0.523(1.03) |
| 64 Footwear, Gaiters Etc. and Parts Thereof | 41.37 (200.84) | 0.07 | 55.59 (267.18) | 0.04 | -0.103 (1.21) | -0.470 (1.14) |
| 65 Headgear and Parts Thereof | 44.18 (192.31) | 0.07 | 53.4 (261.69) | 0.04 | 0.009(0.89) | -0.306(0.99) |
| 66 Umbrellas, Walking-sticks, Riding-crops Etc, Parts | 8.69 (81.94) | 0.01 | 40.3 (238.89) | 0.03 | 0.019 (0.28) | 0.118 (0.28) |
| 67 Prep Feathers, Down Etc; Artif Flowers; H Hair Art | 44.21 (184.23) | 0.07 | 39 (149.34) | 0.03 | -0.040 (0.55) | 0.342(0.55) |
| 68 Art of Stone, Plaster, Cement, Asbestos, Mica Etc. | 86.21 (424.71) | 0.14 | 235.71 (1264.7) | 0.17 | -0.074(0.87) | -0.5020(0.87) |
| 69 Ceramic Products | 29.48 (137.48) | 0.05 | 92.57 (610.29) | 0.07 | -0.082 (1.12) | -0.552(1.12) |
| 70 Glass and Glassware | 384.92 (2,357.55) | 0.60 | 322.19 (1,904.25) | 0.23 | -0.053(1.36) | -1.131(1.36) |
| 72 Iron and Steel | 8,637.13 (53,866.9) | 13.59 | 14,446.69 (8,5141.98)** | 9.92 | 0.001 (0.06) | 0.046(0.06) |
| 73 Articles of Iron or Steel | 669.25 (4118.86) | 1.06 | 1,517.85 (8,940.59) | 1.06 | 0.034(0.38) | 0.256(0.38) |
| 74 Copper and Articles Thereof | 305.26 (1478.49) | 0.49 | 579.46 (3,102.82) | 0.41 | -0.117 (1.47) | -0.847 (1.67) |
| 75 Nickel and Articles Thereof | 478.89 (3365.94) | 0.76 | 405.94 (2,681.67) | 0.29 | 0.001 (0.13) | 0.046 (0.15) |
| 76 Aluminum and Articles Thereof | 637.37 (3819.21) | 1.01 | 5,721.51 (35,898.78)*** | 4.04 | 0.077 (1.21) | 0.858 (1.21) |
| 78 Lead and Articles Thereof | 11.55 (123.09) | 0.02 | 1.57 (10.12) | 0.00 | 0.003 (0.81) | 0.157(0.81) |
| 79 Zinc and Articles Thereof | 87.38 (655.55) | 0.14 | 463.06 (5,419.28) | 0.33 | -0.098 (0.54) | -0.232 (0.54) |
| 80 Tin and Articles Thereof | 0.72 (6.54) | 0.00 | 2.92 (14.15) | 0.00 | 1.0047(2.35)** | 2.543 (2.35)** |
| 81 Base Metals Nesoi; Cermets; Articles Thereof | 1,898.65 (8,751.61) | 3.00 | 1,321.4 (5,262.38) | 0.92 | 0.016 (0.72) | 0.355 (0.72) |
| 82 Tools, Cutlery Etc. Of Base Metal & Parts Thereof | 94.1 (640.73) | 0.15 | 231.14 (1361.35) | 0.16 | -0.086(1.30) | -0.792(1.30) |
| 83 Miscellaneous Articles of Base Metal | 84.79 (167.68) | 0.05 | 39.92 (126.45)** | 0.07 | 1.070 (1.82)** | -0.471(0.82) |
| 84 Nuclear Reactors, Boilers, Machinery Etc.; Parts | 20,15.97 (11,622.76) | 3.16 | 7,723.59 (43,002.29) | 5.45 | -0.022 (0.66) | -0.502(0.66) |
| 85 Electric Machinery Etc; Sound Equip; Tv Equip; Pts | 502.8 (2,720.33) | 0.79 | 1,547.44 (7,271.34) | 1.06 | 0.092(1.90)* | 1.431(1.90)* |
| 86 Railway or Tramway Stock Etc; Traffic Signal Equip | 130.38 (849.15) | 0.21 | 473.48 (2,840.97) | 0.33 | 0.041(2.20)** | 1.312(2.20)** |
| 87 Vehicles, Except Railway or Tramway, and Parts Etc | 1,261.54 (9,383.17) | 2.05 | 11,971.36 (71,249.15) | 8.50 | 0.033 (0.39) | 0.270(0.39) |
| 88 Aircraft, Spacecraft, and Parts Thereof | 65.24 (491.7) | 0.10 | 113 (609.75) | 0.08 | 0.066(1.17) | 0.683 (1.17) |
| 89 Ships, Boats and Floating Structures | 60.09 (473.57) | 0.09 | 298.46 (1,746.13)* | 0.21 | 0.009(0.60) | 0.393 (0.60) |
| 90 Optic, Photo Etc, Medic or Surgical Instrments Etc | 279.1 (1,098.01) | 0.44 | 708.15 (2,653.4) | 0.50 | 0.015(0.19) | 0.126 (0.19) |
| 91 Clocks and Watches and Parts Thereof | 9.53 (61.58) | 0.02 | 11.89 (43.42) | 0.01 | 0.000(0.01) | 0.003(0.01) |
| 92 Musical Instruments; Parts and Accessories Thereof | 13.34 (51.98) | 0.02 | 34.25 (99.53) | 0.02 | -0.036(0.36) | -0.163 (0.36) |
| 93 Arms and Ammunition; Parts and Accessories Thereof | 48.95 (640.8) | 0.08 | 126.37 (774.46) | 0.09 | 0.018(1.34) | 0.773(1.34) |
| 94 Furniture; Bedding Etc; Lamps Nesoi Etc; Prefab Bd | 277.69 (1519.43) | 0.44 | 621.78 (2988.06) | 0.44 | 0.1046(1.42) | 0.754 (1.30) |
| 95 Toys, Games & Sport Equipment; Parts & Accessories | 85.21 (266.56) | 0.13 | 224.47 (709.96)*** | 0.16 | 0.017 (0.20) | 2.115 (2.20)** |
| 96 Miscellaneous Manufactured Articles | 37.72 (139.62) | 0.06 | 48.02 (202.57) | 0.03 | -0.116 (1.29) | 0.743(1.29) |
| 97 Works of Art, Collectors' Pieces and Antiques | 242.05 (643.75) | 0.38 | 497.94 (1,216.38)*** | 0.35 | 1.004 (2.15)** | 0.107 (0.15) |
| 98 Special Classification Provisions, Nesoi | 2,705.1 (12,978.06) | 4.27 | 4,913.02 (18,878.71) | 3.47 | 0.001 (0.73) | 0.522 (0.73) |
| 99 Special Import Provisions, Nesoi | 208.96 (595.56) | 0.33 | 850.63 (2,257.58)*** | 0.60 | 0.000 (0.07) | 3.030 (2.07)** |
| All Commodities | 92,938.73 (381,832.56) | 100.00 | 221,128.23 (9,023,32.37)* | 100.00 | 2.000(2.91)*** | 0.010(1.07) |

Trade Values are in 000s of constant 1999 US prices. The import initiation and intensification effects of AGOA on each of the HS-2 level product classification is derived by decomposing the marginal effects of the variable AGOA in regression of imports of each of the products on the variables included in equation-(2). For results on some selected products, see Table-3.