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The Effects of European Union's Trade Barriers on Africa's Exports

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Abstract: Africa's growth sustainability depends in part on the extent to which it can exploit opportunities that are bound in trade. Many of Africa's major exports are confronted with trade barriers in the markets of their trade partners. These barriers make it difficult for the continent to take advantage of the opportunity that abounds in trade. It is to this end that this study evaluates the effects of trade barriers in the European Union (EU) on African exports. The researchers found that tariffs are the major trade barriers to Africa's exports in the EU market, however the non-tariff barriers significantly affect Africa's exports to this market.

Key words: Trade barriers, exports, Africa, panel data, economy, Nigeria

INTRODUCTION

The attainability of sustainable growth and reduction in poverty level in developing countries has been linked to their interaction and integration with the rest of the world. Trade has been recognised to be part of the channels with which countries can interact or relate economically. Global trade has been acknowledged by many theorists; especially the orthodox ones to have been beneficial and countries could gain from their participation. These theorists based their propositions on the premise that there will be trade flows among/between participating countries. However in reality, this is often not the case as there are trade barriers to some key exports, especially those that developing countries and particularly Africa has comparative advantage.

As a result of these trade policies, Africa found it difficult to take full advantage of the opportunities embedded in global trade. In the theory of comparative cost advantage, countries are advised to specialize in the production of commodities in which they have comparative cost advantage over other countries. This will make countries to gain from international trade. African exports prior to this time (during 1950s and 1960s) have performed relatively well in terms of the volume and number of products while the issue of market access barriers to their exports in the markets of their trading partners did not arise.

Though, Africa has its strength in the production of primary products that attract fewer restrictions in the developed nations' markets (especially in the markets of their colonial masters), continent has however gain from trade in which the returns serve as the bulk of their foreign exchange during these periods. However, over the last 3 decades, the developed countries found it appropriate to engage in backward integration (that is to encourage the production of primary products for the use of the industrial sector of their economies) that will reduce the import bills they pay to their trading partners.

It is as a result of this that the developed countries started encouraging the production of primary products especially agricultural products which attracted some supports and subsidies that distort international prices of these commodities. These subsidies and supports made imports from African countries to be less competitive coupled with the fact that these developed countries imposed restrictions on agricultural exports access to their markets.

So far, there has been a divergence of opinions as to what really undermines Africa's exports in global trade. While African governments believe that it is the trade barriers that hindered Africa's exports to developed countries and some developing countries, thereby reducing the income level and employment rate, some scholars opined and even argued that even if Africa's exports are allowed free access to the developed countries' markets, the continent lacks the ability to produce to meet the demand due to Africa's supply constraints.

Some studies have been carried out on the issue of market access conditions, many of which ascertained the extent that Africa has gained from the trade preferences granted to the continent (Mayer and Zignago, 2005; Hammouda *et al*., 2005; Francois and Wooton, 2006; Francois *et al*., 2005; Manchin, 2004; Amjadi *et al*., 1996; Yeats, 1998). The studies that modelled the actual distortions to trade due to market access restrictions focused on trade mostly between developed and developing, i.e., North-South trade and in particular

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for Sub-Saharan Africa (Kee *et al*., 2006; Mayer and Zignago, 2005). It is against this background that this study tends to determine the effects of trade barriers in the European Union (EU) on Africa's exports.

MATERIALS AND METHODS

The model for this study is adapted from the empirical study of Mayer and Zignago (2005) that modelled market access in global and regional trade through a border-effect methodology. The modification that the thesis has done to the study of Mayer and Zignago (2005) is by including regional trade agreements, colonial affiliation and language. The theoretical underpinning the gravity type will occur in almost every trade model with full specialization, as shown by Evenett and Keller (2002).

The theoretical framework for this model is derived from the new trade theory above that made provision for economic of scale and imperfect market. Bergstrand (1990) provides a description of the link between gravity equation and bilateral trade patterns in a monopolistic competition framework of the new trade theory.

Tinbergen (1962), Poyhonen (1963) and Linnemann (1966) were the set of researchers that first applied gravity model to the analysis of global trade flows. The simplest form of international trade gravity model assumes that the volume of trade between any 2 trading partners is an increasing function of their national incomes and populations and a decreasing function of the distance between them.

In this model, it is common to use the dummy variables to capture geographical effects (such as signalling whether the 2 countries share a border or if a country has access to the sea), cultural and historical similarities (such as if two countries share a language or were linked by past colonial ties), regional integration (such as belonging to a free trade agreement or sharing a common currency), as well as other macroeconomic policy variables (such as biliateral exchange rate volatility). Bergstrand (1985) and Helpman and Krugman (1985) have derived gravity equations from trade models based on product differentiation and increasing returns to scale.

Linnemann and Verbruggen (1991) have explicitly studied the impact of tariffs on bilateral trade patterns using a gravity model framework. However, it was Estevadeordal and Robertson (2002) that explicitly studied the incorporation of preferential tariff rates in a gravity model.

The monopolistic competition model of new trade theory provides the theoretical foundations to the gravity model (Helpman, 1987; Bergstrand, 1989). Here, the product differentiation by country of origin approach is replaced by product differentiation among producing firms while the empirical success of the gravity model is considered to be supportive of the monopolistic competition explanation of intra-industry trade.

Assume that the consumers in country i have a two-level utility function where the upper level is a Cobb-Douglas with expenditure parameter u_i which gives rise to a fixed expenditure share out of the income y_i. The lower level utility function on the other hand is a Constant Elasticity of Substitution (CES) aggregate of differentiated varieties produced in the considered industry, with ó representing an inverse index of product differentiation:

$$U_i = \left(\sum_{j=1}^{N} \sum_{h=1}^{N_j} \left(a_{ij} c_{ij}\right)^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} \quad (1)$$

The CES structure usually indicates the love for variety, based on the fact that the consumers are willing to consume all the available varieties. The study shall deal with a situation where the consumers have different preferences over varieties depending on bias. The consumers' preference parameter in country i for varieties produced in j is denoted a_{ij}.

Thus, the solution to Eq. 1 gave an estimable equation with respect to Africa's trade relations with her trade partner from the monopolistic competitive equation of Krugman (1980) and Kareem (2010):

$$\begin{aligned} \ln\left(\frac{m_{ij}}{m_{ii}}\right) &= -(\sigma-1)[\beta+\eta] + \ln\left(\frac{\upsilon_j}{\upsilon_i}\right) - \sigma \ln\left(\frac{P_j}{P_i}\right) - \\ &(\sigma-1)\ln\left(1+t_{ij}\right) - (\sigma-1)\ln\left(1+ntb_{ij}\right) - (\sigma-1)\delta \\ &\ln\left(\frac{d_{ij}}{d_{ii}}\right) - (\sigma-1)[\theta_1 - \eta_1]RTA_{ij} + \in_{ij} \end{aligned} \quad (2)$$

$$\in_{ij} - (\sigma\text{-}1)\,(e_{ij} - e_{ij})$$

where $(-(\sigma - 1)[\beta + \eta])$ is the constant of Eq. 2 and it gives the border effect of the international trade for countries that belong to the same group, the south for instance. This includes both the level of protection of the importing country (β) and the domestic bias of consumer (η). The coefficient RTA measures the effects that the regional trade agreements have on African exports.

Theoretically, we expect an inverse relationship between relative price and Africa's exports due to the problem of imported inflation that might arise in the economies of Africa's trading partners. Relative output is expected to have a direct relationship with Africa's exports that is as output increases; there will be more to

export. Tariffs and non-tariffs are expected to have inverse relationship with Africa's exports. This means that as more market conditions are imposed on Africa's exports there will be restriction in the access of Africa's exports and if eventually the exports get into the trading partners market, it cannot compete favourably with similar products.

Same colonial affiliation is expected to enhance trade theoretically that is countries of the same colonial affiliation tend to trade more with themselves. Language is a barrier to trade if the trading partners did not speak similar language. Distance is another inhibiting factor to trade that is the higher the distance, the lower the trade. Involvement in trade agreements is expected to boost trade among trading partners.

Estimation issues: The main reason for preferring panel data analysis is that the cross-section specification is very likely to suffer from omitted bias because of the unobserved county specific effects, outlines, model uncertainty and it completely neglects the temporal aspects (and dynamics) of foreign trade.

The generalized method of movements is adopted as the estimation technique in this thesis because it has the potential to correct for endogeneity and heteroscedascity problems that may arise from the use of other panel data estimation techniques. According to Greene (2003), GMM provides an estimation framework that possesses a method of formulating models and implied estimators without making strong distribution assumptions.

Endogeneity of the right-hand regressors is a serious problem to the Ordinary Least Square (OLS) estimators because it will lead to omission of variables, measurement error, self-selection and sample selectivity. Thus, these problems cause inconsistency in the OLS estimates and thus could be corrected by the use of any instrumental variables estimators (Baltagi, 2001). The GMM estimator is asymptotically efficient with an increasing set of instruments as the sample size grows attains the semi-parametric efficiency band of the model (Conley, 1999).

Estimation techniques: This study makes use of generalized method of moment panel data analytical method. This method allows us to estimate the regression equations for the whole of Africa. The reason for the use of panel data technique in the gravity model is based on the several benefits of the technique as identified by Hsiao (1985, 1986), Klevmarken (1989) and Solon (1989). It could be used to control for individual heterogeneity, it provides more informative data, more variability, less collinearity among the chosen variables, more degree of freedom and more efficiency. Also, panel data technique is a better option when one intends to study the dynamics of adjustment and duration of economic states like poverty and employment and if these panels are long enough they can shed light on the speed of adjustments to economic policy changes. Panels are necessary for the estimation of inter-temporal relations, life-cycle and intergenerational model and they can easily relate individual's experiences and behaviour at another point in time. They are better able to identify and measure effects that are simply not detectable in cross-section or time-series data such as in Ordinary Least Square (OLS) method. The basic class of specification of these models is given as:

$$Y_{it} = f(X_{it}, \beta) + \delta_i + \gamma_t + \epsilon_{it} \quad (3)$$

This leading case involves a linear conditional mean specification, so that we have:

$$Y_{it} = \alpha + X_{it}\beta_{it} + \delta_i + \gamma_t + \epsilon_{it} \quad (4)$$

Where:

Y_{it} = The dependent variable
X_{it} = K-vector of regressors
ϵ_{ij} = The error terms for i = 1, 2, …, M cross-sectional units observed for dated periods t = 1, 2, …, T.
α = The constant of the model
δ_i and γ_i = The fixed and random effects, respectively

Identification obviously requires that the β coefficients have restrictions placed upon them. They may be divided into sets of common (cross-section and periods), cross-section specific and period specific regressor parameters. This panel estimation technique will enable us to estimate panel equations using linear or non-linear squares or instrumental variables (system of equations) with correction for the fixed or random effects in both the cross-section and period dimensions and in addition, the Generalized Method of Moment (GMM) will be used to estimate the specification with various system weighting matrices. It should be noted that apart from the above basis for panel data analysis, panel equations allow us to specify equations in general form and also permits specification of non-linear coefficients mean equations with additive effects. Panel equations do not automatically allow for β coefficients that vary across-sections or period but one may create interaction variables that permit such variation.

RESULTS AND DISCUSSION

The results of the panel-gravity models used in this study are shown in the Table 1. The estimates of the panel-gravity models are done through Generalized Method of Moments (GMM). Using the GMM to estimate

Table 1: Panel gmm result

Variables	No effects	Random effects
Routput	0.1321 (8.70)[c]	0.1537 (2.09)[b]
Rprices	-0.0006 (-0.58)	-0.0015 (-1.87)[a]
Tariffs	-0.0016 (-1.08)	-0.0010 (-2.06)[b]
NTB	-0.0162 (-1.32)	-0.0217 (-7.15)[c]
Distance	-0.00068 (-6.09)[c]	-0.0001 (-6.91)[c]
Language	-0.0004 (-9.90)[c]	-0.0003 (-8.73)[c]
RTA	-0.0069 (-1.53)	-0.0037 (-17.32)[c]
Colonial	0.0025 (0.97)	-0.0047 (-5.54)[c]
Constant	0.0048 (1.64)	0.0203 (2.35)[b]
Adj. R^2	0.57	0.53
Std. error	0.0053	0.0013
D. watson	1.58	1.78
J.statistic	63.09	53.41

The Figures in parentheses are the t-statistic. The superscript c, b, a indicate 1, 5 and 10% level of significant, respectively

the models, the researchers present two different estimates of the GMM, vis-à-vis, no effect and random effect. The researchers have decided to estimate the random effect due to the fact that the models for this study are gravity models that have dummy variables of which fixed effect estimator will be inappropriate.

According to Baltagi (2001) and Greene(2003), fixed effect also known as Least Squares Dummy Variables (LSDV) suffers from a large loss of degree of freedom, in which when it involves estimating (N-1) extra parameters and too many dummy variables, this will aggravate the problem of multicollinearity among the regressors. Also, the fixed effect estimator cannot estimate the effect of any time-invariant variable like sex, race, language, religious, colonial links, schooling etc. because they will be wiped out by the Q transformation, the deviations from means transformation. Thus, they concluded that any regression attempting to use this estimator will fail. It is on this basis that in this study the researchers have used the random effect estimator.

Estimating the no effects regression indicates that relative output between EU and Africa is an important variable to consider when modelling their trade relations. The result shows relative output has a significant positive slope in the model and it indicates that the absorptive capacity of the EU to exports from Africa is about 13%. The relative price conform with the apriori expectation, indicating that an increase in the relative prices will reduce the access of African exports to the EU, though statistically insignificant (Table 1).

Tariffs have the required slope which means that they are in conformity with the apriori expectation. The result shows that as less preferential tariffs (increase in tariffs) is granted to Africa's products there will be reduction in the access of the continent's exports to the EU such that for every 100% preferential tariffs reduction there will about 0.2% fall in Africa's exports access to the EU market.

However, the non-tariff barriers indicate that for every 100% increase in NTB on products (imports) relevant to African countries there will be about 2% drop in Africa's exports. Distance here is significant to the model and shows that it could discourage trade if the trading partners are far away from each other. Language also shows that if the trading partners do not speak same language, this might cause a barrier that will affect trade.

Though, the magnitude of the reduction in trade is small 0.05% but it is statistically significant. Colonial affiliation between Africa and the EU will propel trade among them. This is means that the EU often trade more with those countries in Africa that they have same colonial affiliation or that they colonized. This could be seen in the relationship between francophone African countries and France.

The researchers discovered from the coefficient of the constant that there has been a considerable level of integration among African countries in this model, though it is insignificant but the magnitude is about 0.5%. However, the regional trade agreements between the continent and EU have not yielded any genuine trade to the continent. This essentially might be due to Africa's supply constraints.

In the random effects, the estimate confirms the results of the no effect estimator but here the random effect was able to establish significance to those hitherto insignificant. For instance, tariffs and NTB were not significant in the non-effect model but are now significant. Also, RTA and level of integration (constant) were not significant until now. Lastly, a major difference is that the colonial affiliation that is before now positively sloped is now having statistically significant negative relationship with trade. This result conform with Mayer and Zignago (2005) and Hammouda *et al.* (2005).

CONCLUSION

This study has evaluated the effects of trade barriers in the EU on Africa's exports. The researchers discovered that African exports have not been gaining access to the EU market not only because of inadequate implementation of the trade agreements which had led to the trade barriers imposed on their export products but due to the fact that Africa has low and inadequate production capacity that will enable her to meet up with the market access allowed to her products despite the potentiality of her output gaining access to these trading partners markets. The researchers also conclude that products of relevance to African countries are mostly hindered by non-tariff barriers imposed by the EU through product and process standard. However, the magnitude of the effects of tariff

barriers is very minimal to have any meaningful impact on Africa's exports access to the EU since the continent still enjoy preferential tariff rates. Thus, the major trade barriers to Africa's exports are the non tariff barriers. Efforts must be made by African governments to ensure that the EU reduces the imposition of non-tariff barriers to products that are important to Africa.

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