

Trade creation and Trade Diversion in the COMESA: Evidence of Kenya's import Flows in Food and Live Animals

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Abstract: *The paper used gravity model to analyze trade creation and trade diversion. All continuous variables exhibited unit root at levels except for population, but all became stationary after first difference. It was found that GDP was significant and positive as expected. Kenya's Population was also positive and significant but the estimate of the exporter population was negative. All were significant at 0.05 level, where $P < 0.05$. From the analysis, there was evidence of trade creation and trade diversion. It was recommended that the government to strongly push for free trade in order to fully realize the benefits therein.*

Keywords: *Trade Creation, Trade Diversion, Robust Random Effect*

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I. Introduction

The economies of countries south of the Sahara are disjointed, and Africa as a whole is marginalized in the world market arena. With a combined Gross Domestic Product (GDP) of USD 343.4 billion in 2000, the SSA's GDP within this period fell below that of the Netherlands (USD 385 billion) while its exports were USD 116 billion approximately equal to that of Switzerland (World Development Indicators, 2012).

Among the oldest regional integration economic communities in Africa includes the South African Customs Union (SACU) established in 1910 and the East African Community (EAC) formed in 1919. Several regional economic communities have ever since been formed mainly since the 1970s. The trends in regional integration increased in the early 1960s following the formation of the European Economic Community (1957) and the European Free Trade Area in 1960 after which it was followed by a bigger number of regional trade agreements by the developing countries (History of European Union, 1957). With more than ten regional economic groupings in Africa, there is hardly any country that is not a member of at least one regional economic bloc in Africa today. The issue of regional trade agreements therefore continues to occupy centre stage in the economic agenda of many Countries.

In Africa, at the initial two post-colonial gatherings in April 1958 and in June 1960, African leaders embraced regionalism as one panacea for the economic constraints forced by the littleness and discontinuity of national markets. All things considered, history has demonstrated that the ISI approaches flopped in singular nations as well as in the provincial coordination groupings. Such courses of action propelled to aftermath of mold in the 1970s, to a limited extent in light of the fact that the main encounters were not fruitful (Aniche & Ukaegbu, 2016).

Apart from regional level agreements, efforts have also been ongoing to create economic cooperation and eventually meaningful continental economic integrations between African countries. These led to the signing of Abuja Treaty (The African Economic Community Treaty) in 1991 and which came into force in 1994. The preliminary objectives of the treaty was to establish a continental-wide economic cooperation through reinforcing the regional economic communities (RECs) already in place and encouraging the formation of new ones across the continent. Teshome, 1998 notes that six RECs within Africa were seen to be the building blocks for such continental-wide integration inventiveness.

On the march of 21st 2018 in Kigali, 44 African countries signed the framework for the establishment of the African Continental Free Trade Area (AFCFTA). This will be one of the world's biggest facilitated commerce zones as far as the quantity of nations, covering in excess of 1.2 billion individuals and over \$4 trillion in consolidated purchaser and business spending if all the 55 countries join. The A.U. and its member countries hope the AFCFTA will accelerate continental integration and address the overlapping membership of the continent's regional economic communities (RECs). Many African countries belong to multiple RECs, which tends to limit the efficiency and effectiveness of these organizations. The goal is to help African countries

in trade liberalization across sub regions and at the continental level. As a part of the AfCFTA, countries have committed to remove tariffs on 90 percent of goods.

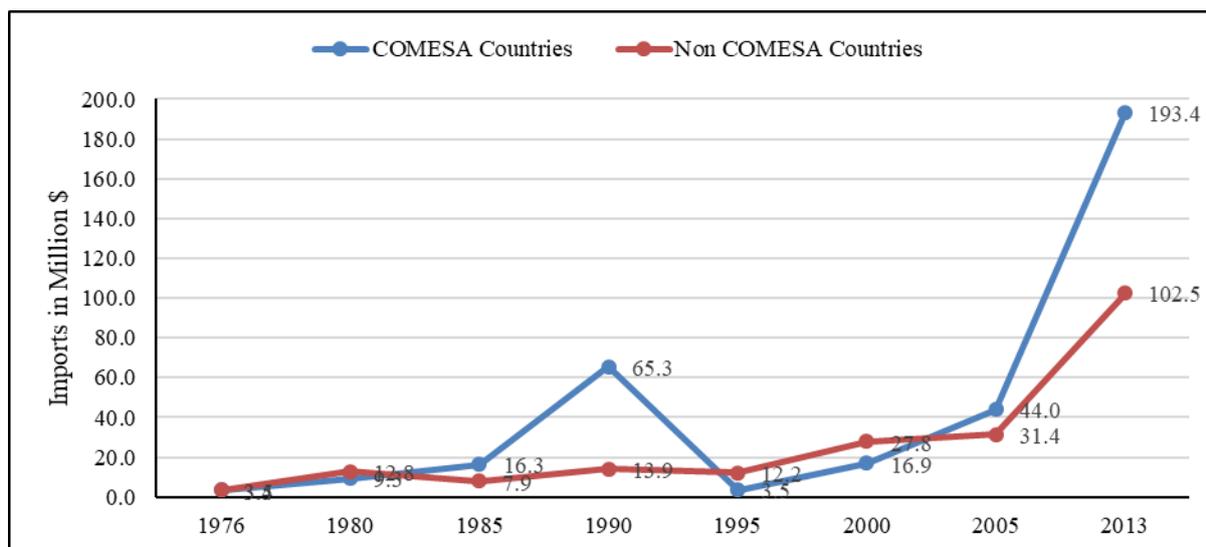


Figure 1: Imports of food and live animals from COMESA and non-COMESA member states (1976-2013)
 Source: Author's computation using data from WITS database

Frankel (1997) points out that the literature on regional trade agreements refers to the preemptive effects of trade agreements. Preemptive effects consist in an unexpected increase in regional trade preceding the implementation of a regional trade agreement as firms seemingly prepare to take full advantage of tariff preferences. Considering comesa was founded in 1981 but ratified in 1994 (the year it was ratified to a common market), the anticipatory effects are evident in Figure 1 between 1985 and 1990-1995. There was a general increase in imports of food and live animals from comesa and non-comesa countries from 1994 upwards to 2013 with more imports from the comesa partners.

The Evolution of the Common Market for Eastern and Southern Africa

The Common Market for Eastern and Southern Africa traces its genesis to the mid-1960s. The initiative of regional economic co-operation received substantial thrust from the buoyant and sanguine mood that characterized the post-independence era in most of Africa. This mood was one of pan-African commonality and collective self-reliance born of a shared destiny and this led to the United Nations Economic Commission of Africa convening a ministerial meeting of Newly Independent States of Eastern and Southern Africa in 1965. The aim of the meeting held in Lusaka Zambia, was to consider suggestions for the establishment of systems to advance sub-regional economic integration. The creation of an Economic Community of Eastern and Central African states was recommended in this meeting.

The creation of a sub-regional economic community was recommended at a meeting held in Lusaka, Zambia in 1978 that adopted the Lusaka declaration of intent and commitment to the creation of a Preferential Trade Area for Eastern and Southern Africa (PTA). The treaty establishing the PTA was signed at a heads of states and Governments meeting in Lusaka in September 1981 and the treaty came into force after ratification by more than seven signatory states.

The PTA's establishment was to take advantage of a greater market size, to share the region's common tradition and destiny and to allow greater social and economic co-operation, with the final objective being to create an economic community. The PTA treaty's visualization into a common market was achieved in later in 1993 when the accord establishing COMESA was signed in Kampala, Uganda and ratified in Lilongwe, Malawi in 1994.

It is vital to emphasize the fact that the establishment of PTA, and its transformation into COMESA, was consistent with the objectives of the Lagos Plan of Action (LPA) and the Final Act of Lagos (FAL) of the Organization of African Unity (OAU). Both the LPA and the FAL envisaged an evolutionary process in the economic integration of the continent in which regional economic communities would constitute building blocks upon which the creation of an African Economic Community (AEC) would ultimately be erected.

The implementation of the original goals of COMESA has been delayed. The original plan was for a full trade agreement by all members to be in place by October 2000 but only nine-member states had met the target of free trade by that date.

Trade creation and trade diversion

Trade creation (TC) occurs due to an introduction of a Regional Trade Agreement, which in turn permits the supply of products from a more efficient producer of the same product. On the other hand, trade diversion (TD) occurs when the introduction of an RTA shifts trade away by allowing the supply of products by a less efficient supplier within the RTA *vis a vi* a more efficient supplier outside the RTA. The introduction of an RTA will have both effects and hence while assessing whether an RTA hinders or enhances welfare then net effects need to be assessed.

II. Literature Review

RTAs usually involve a group of countries agreeing to engage in free trade within the economic bloc but maintain tariffs with the rest of the world. When under a free trade area the member countries apply different tariffs on import flows from the rest of the world while in the case of a customs union, the countries apply a common external tariff with the rest of the world. This chapter therefore provides a theoretical and empirical review of literature on the impacts of RTAs on welfare development.

Empirical Literature

Many methodologies have been used in the recent past in assessing the impacts of regional economic integrations on trade flows. Some of the analytical tools mostly utilized include the computable General Equilibrium approach (Simulation), the gravity model approach and descriptive or econometric approaches (partial equilibrium analysis approach). These methodologies have been used with different kinds of data including time series, cross-sectional data and panel data at either an aggregate or sectorial level.

In his analysis to evaluate the outcomes of the North American Free Trade Area (NAFTA), (Hertel, Hummels, Ivanic, & Keeney, 2007) found out that there was an increase in imports in all regions of the world as a result of NAFTA that was robust in trade elasticities. CGE analyses however, have a major setback in that results generated are highly sensitive to the assumptions made, data used in the model and parameter estimates in terms of their interpretations. (Asafu- Adjaye, 2004) also notes that CGE models do not allow for analysis of the explicit designated markets in regional blocs.

In their study of the Effects of regional economic integrations, (Baldwin & Venables, 1995) applied different indicators to allow for the measurement of the concentration of regional trade. Additionally, this approach assumed that there will be no change in the share of trade within the regional bloc as well as with the affiliating countries. Its dependence on the static approach precincts the results to be highly determined by the level of aggregation.

According to (Cernat & Development, 2003) gravity model of trade has been commonly used together with studies that involve ex-post analysis to show the extent of trade under free trade agreement or in cases where the customs union has proved to be challenging to implement. (Timo, 2010) applied the gravity model in analyzing international trade flows in the 1960s. Since their studies, a number of authors have used the gravity model as an empirical tool in the analysis of international trade data sets. Their reasoning was that the model gives a better picture and results to the majority of the regions.

Simultaneous equations models were used by (Meyer et al., 2016) to demonstrate empirically that higher mutual trade flows boosts the likelihood that countries will form free trade agreements. It means therefore that the parameter estimates of the RTA dummy variables are capturing more than just the effects of the agreement but also includes the possibility that high levels of intra bloc trade might not be only resulting from the preferential trade agreements formed, but rather due to historical or political relationships between bloc members.

In African context, there are huge empirical works that analyse the impacts of regional integration. Among these, (Geda & Kibret, 2002) on their study for COMESA, show that bilateral trade flows among the regional groupings could be explained by standard variables as demonstrated by the results of the conventional gravity model, while regional groupings have had insignificant effect on the flow of bilateral trade. Further, they suggest that the performance of regional blocs is mainly constrained by problems of variation in initial condition, compensation issues, real political commitment, overlapping membership, policy harmonization and poor private sector participation.

III. Methodology

Data and Methodology

The data collected to estimate this model are trade values, GDP in current US dollars GDP per capita in current US dollars, distance, common language, land area, and adjacency. Trade values at the one-digit level of disaggregation were retrieved from the UN Comtrade database. The selected commodity classification system was the SITC Rev.1 which has data available for years even before 1970. Import trade values were deflated

using the US CPI. Geographic variables were collected from the CEPII (*Centre d'Etudes Prospectives et d'Informations Internationales*) and GDP related variables were collected from World Development Indicators.

Table 1: Definition of variables

Variable	Description	Data Source	A priori Assumption
y	Imports of Food and Live animals	World Integrated Trade Solutions (WITS)	
x1	Combined GDP in Current \$ US	World Development Indicators (WDI) of the World Bank	+
x2	Kenya's population	World Development Indicators (WDI) of the World Bank	+
x3	Population of the exporting Country	World Development Indicators (WDI) of the World Bank	+
x4	distance	CEPII (Centre d'Etudes Prospectives et d'Informations Internationales)	-
x5	Common official language	CEPII (Centre d'Etudes Prospectives et d'Informations Internationales)	-/+
x6	Adjacency	CEPII (Centre d'Etudes Prospectives et d'Informations Internationales)	+
x7	Land lock	World Trade Organisation Database	+/-
x8	Dummy variable for both members are COMESA	World Trade Organisation Database	+/-
x9	Dummy variable for a non COMESA exporter	World Trade Organisation Database	+/-

Theoretical formulation of the Gravity equation

The first formulations of the gravity equation and its extensions are found in (Oguledo & Macphee, 1994) and (Gleijser & Dramais, 1969). According to (Frankel, 1998) the empirical success of the gravity equation is due to the fact that it can explain some real phenomenon that the conventional factor endowment theory of international trade cannot; the trade between industrialized countries, the intra-industry trade and the lack of dramatic reallocations of resources when trade liberalization processes have taken place.

According to the generalized gravity model of trade, the volume of exports between a pair of countries, X_{ij} , is a function of their incomes (GDPs), their populations, their geographical distance and a set of dummies. Various exact examinations demonstrated that exchange streams take after the physical standards of gravity: two inverse powers decide the volume of two-sided exchange between nations - the level of their monetary action and wage, and the degree of inhibitions to trade. National borders are among these inhibitions, even for industrialized countries (Bhagwati, Bhagwati, Krishna, & Panagariya, 1999)

Hypothetical help of the examination in this field was at first exceptionally poor, yet since the second 50% of the 1970s a few hypothetical advancements have showed up in help of the gravity demonstrate. (Anderson, 1979) made the principal formal endeavor to get the gravity condition from a model that expected item separation. All the more as of late (Deardorff, 1995) has demonstrated that the gravity condition describes numerous models and can be advocated from standard exchange speculations. The differences in these theories help to explain the various specifications and some diversity in the results of the empirical applications.

When it comes to estimating and analyzing trade creation and trade diversion effects in the trade among countries, and between member countries and non-members, the hypothetical literature showed that the formation of free trade areas, customs unions, or other preferential trading blocs had indeterminate effects on economic welfare. Territorial exchange assertions could be helpful or unsafe to the partaking nations on the grounds that the special idea of these exchange bargains stimulates both trade creation and trade diversion (Bhagwati et al., 1999). The empirical work on the subject has proven to be challenging that it cannot answer "even the most basic issue regarding preferential trading agreements: whether trade creation outweighs trade diversion" (Haveman & Hummels, 2001).

The most basic form of the gravity model defines trade between two countries as a function of their GDPs, populations (or GDPs per capita), and the distance between them. Other variables that are also sometimes included control for cultural affinity and land area. Land area supplements economic size variables since it incorporates information about natural resources to the model (Frankel, 1997). The dependent variable varies across studies. Some studies use the sum of import and export flows as the dependent variable while others focus on a single trade flow, usually import flows, when the objective is to analyse trade diversion and trade (Datta & Kouliavtsev, 2005); (Magee, 2008). This paper makes use of the import flows as the dependent variable and following (Frankel & Romer, 1999), the basic specification, for cross-sectional data, takes the following form:

$$\text{Log}F_{kt} = \gamma_0 + \gamma_1 \text{Log} (GDP_k * GDP_j) + \gamma_2 \text{Log}Pop_k + \gamma_3 \text{Log}Pop_j - \gamma_4 \text{Log}dist_{ij} + \gamma_5 \text{Lang}_{ij} + \gamma_6 \text{Adjac}_{ij} + \gamma_7 \text{Landlock}_{ij} + \epsilon_{ij} \dots \dots \dots (2)$$

In this model F_{it} represents the value in current US dollars of country i 's imports from country j , the product of GDPs captures the size of the economies while the product of GDPs per capita gathers information on income and population. Distance is theorized to be inversely proportional to trade volumes and cultural affinity in the dummy variable for language, Common colony and Adjacency enters the equation positively.

To analyse the effects of regional trade agreements, the specification above is usually augmented to include a set of dummy variables representing intra bloc and extra bloc trade. A positive and significant coefficient on the parameter representing membership is interpreted as trade in excess of what is predicted by the gravity model and is considered evidence of trade creation. A negative and significant coefficient on the dummy variable for extra bloc trade is evidence of less trade than predicted by the basic specification, and interpreted as evidence of trade diversion. The study estimated a benchmark model of the following form:

$$\text{Log}F_{kt} = \gamma_0 + \gamma_1 \text{Log}(GDP_k * GDP_j) + \gamma_2 \text{Log}Pop_k + \gamma_3 \text{Log}Pop_j - \gamma_4 \text{Log}dist_{ij} + \gamma_5 \text{Lang}_{ij} + \gamma_6 \text{Adj}_{ij} + \gamma_7 \text{Landlock}_{ij} + \gamma_8 \text{BothCOM}_j + \gamma_9 \text{OneinCOM}_{jt} + \epsilon_{kj} \dots \dots \dots (3)$$

Remember the data are at the one-digit level of commodity disaggregation. Hence, the additional subscript k is introduced to index commodities. Considering only imports into Kenya are analyzed, the subscript j indexes exporting countries and k reflects Kenyan values. As Woolridge (2002) suggested, the study model was estimated with robust random effects errors in order to correct for serial correlation and heteroskedasticity in the error terms.

IV. Empirical Results And Discussions

The summary statistics of the variables in the model are shown in table 2 below. The summary includes both the dependent variable and the independent variable.

Table 2: Summary Statistics

Variable	Observations	Mean	Std. Deviation	Minimum	Maximum
Y	1520	5.2640	0.438	4.4980	6.048
x1	1520	20.723	1.211	17.234	23.964
x2	1520	7.417	0.148	7.146	7.652
x3	1520	7.182	0.834	7.782	9.133
x4	1520	3.601	0.336	2.704	4.129

The four independent variables in table 2 were included to determine their distribution on the basis of mean and standard deviation. The rest of the explanatory variables are dummy.

Test for Stationarity of the Variables

This study used a balanced data set in the regression analysis with 26 number of panels and 23 periods. As common in panel data, the study first checks out for unit root tests in the model variables by applying some panel unit root tests to determine a hypothetically cointegrated relationship. The standard unit root tests provided by Im, Pesaran and Shin (2003) was used in the present study. IPS (2003) developed a set of tests that relaxes the assumption of a universal autoregressive parameter. The continuous variables were tested for stationarity both at levels and first difference. All of the variables exhibited unit root at levels except for population. After first difference, all of the variables became stationary as shown in table 3 below.

Table 3: Stationary Tests Regression Results

Variable	Stationarity in Levels			Stationarity after first difference		
	Statistic	p-value	Decision	Statistic	p-value	Decision
Y	0.0720	0.5287	Unit root	-29.33	0.000	Stationary
x1	12.016	1.000	Unit root	-16.099	0.000	Stationary
x2	11.015	1.000	Unit root	-16.031	0.000	Stationary
x3	-33.74	0.000	Stationary			
x4	-0.197	0.422	Unit root	-7.3043	0.000	Stationary

The continuous variables included in the model experienced constant variance over time after first difference.

Robust Random Effect Regression Results

Table 4 below shows the results from regression analysis. The table shows the coefficients, standard errors and the P values at the 0.05 level of significance.

Table 4: Panel Regression Results

Variable	coefficient	std. error	z	p > z
x1	0.567806*	0.0085241	6.66	0.000
x2	2.526996*	0.031073	81.32	0.000
x3	-0.304054*	0.0064805	-4.69	0.000
x4	-0.692272*	0.0225773	-3.07	0.002
x5	-0.0032403	0.00982	-0.33	0.741

x6	-0.336988*	0.0149934	-2.25	0.025
x7	-0.0060509	0.0092184	-0.66	0.512
x8	0.0316246*	0.0128788	2.46	0.014
x9	-0.0043806	0.0083931	-0.52	0.602
constant	-14.19022	0.1152905	-123.08	0.000

Source: Author's computation from STATA, 2018

Significance level of 0.05, *statistical significance: *<0.05

The standard variables of the gravity model are expressed in logarithms; therefore their coefficients are interpreted as elasticities. The estimated importer's GDP (x1) coefficients generally have the expected positive sign is significant at the 0.005 level of significance. For instance, a unit percent increase in Kenya's GDP will result in an increase of food and live animals import trade by 0.57%. The results therefore shows that regional trade in food and live animals has a positive relationship with income. This also in consistent with findings from the existing literature that the higher the GDP of the importer country the higher the demand for imports resulting to a higher import volume.

The parameter estimate for importer population (x2) for the model is positive and statistically significant. A one percent increase in Kenya's population therefore leads to a 2.5% increase in the imports of food and live animals. Larger importer population size encourage more trade with the partners (larger population leads to increased consumption hence increase imports. Conversely, the parameter estimate for the exporter population (x3) is negative, that is 1% increase in the exporters population will lead to a 0.3 % decrease in its exports. This is explained by the fact that an increase in population will lead to increased local demand of the products and hence the exporter country has to meet its domestic demand before exporting the surplus.

The distance (x4) variable has a negative and significant coefficient. Kenya's imports of food and live animals decrease by 6.9% when distance between trading countries increases by 10% indicating that distance is still a major hindrance to trade.

The above results also conform to the classical theory of trade by Helpman-Krugman¹. Generally, this results are consistent with findings from other studies such as Yego and Siah (2018) and Jekemei (2014).

Trade creation and trade diversion

The variables x8 (member) and x9 (non-member) were used to explicitly investigate the evidence of trade creation and trade diversion in the COMESA region using Kenyan import flows of food and live animals. There was evidence of trade creation with the parameter estimate of x8 being significant and positive at the 0.005 level of significance (0.032). This empirical findings thus supports a finding of trade creation in Kenya as a result of COMESA. Regional trade has increased and the increase in import flows of food and live animals have not been realized at the expense of imports from the rest of the world since the parameter estimate of the variable x9 (representing non-member) has to be negative and statistically significant to support an argument of trade diversion in Kenya. There is an inconclusive evidence of trade diversion in Kenya since the parameter estimate of the non-comesa variable was positive but statistically insignificant. Generally developing economies tend to trade more with themselves since most of the developing counties are not able to penetrate into markets of developed economies due to trade protection and stringent sanitary and phytosanitary standards in place.

V. Conclusion

The exertion of this research paper was to investigate trade creation and trade diversion in Kenya's imports of food and live animals after the creation of COMESA. The article used the gravity model of international trade. The model was estimated using the robust standard error model to correct for serial correlation and heteroskedasticity. All the standard gravity equation variables were in conformity with the expected gravity equation theory i.e. Trade increases with income and decreases with distance.

The study found evidence of trade creation in Kenya regarding the imports of food and live animals, however there was an inconclusive evidence of trade diversion. The original goal of the COMESA was for free trade by the year 2000. Trade diversion may have therefore taken place but considering that Kenya has a high production capacity in food and live animals, meaning that the observed increase in imports from COMESA far offsets the negligible loss brought about by trade diversion. The Kenyan government therefore ought to continue pushing for free trade and no-tariff barriers trade of food and live animals as is beneficial to the economy.

¹ In a theoretical foundation of the gravity model, trade is expected to increase in GDP and decrease with distance.

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