Effects of East African Community Regional Trade Agreement on Member’s Agricultural Exports

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ABSTRACT
Agricultural activities contribute to about 33% of the East African Community’s Gross Domestic Product (World Bank, 2009), 83% of the populace live in rural areas and 80% of the populace depend on agriculture directly and indirectly for food, employment and income, while about 40 million people in EAC suffer from hunger. Agriculture and agricultural trade is therefore a tool that can be used to transform the rural areas and help reduce poverty levels in the region. EAC member states has formulated and implemented a number of initiatives to boost intra-regional trade. However, intra-EAC trade remains very low, that is, at 9% of the total regional trade (compared to other RTA in Africa and beyond, for instance: EU–66%; East Asia–55%; NAFTA–44%; ASEAN–27% and SADC–13%). Agricultural trade accounts to above 40 per cent of the intra-EAC trade. This study investigated effect of EAC-RTA on the regions agricultural trade by analyzing the degree of trade creation and diversion effects. Augmented gravity models were estimated under Random Effects using the Pseudo Poisson Maximum Likelihood approach. The study used Panel data from UNCOMTRADE, International Financial Statistics and World Development Indicators for the period 2000–2012 on the five EAC members and other 77 trade partners. The empirical findings showed Kenya and Tanzania benefited more from the integration in terms of agricultural exports, while Uganda, Rwanda and Burundi had no significant benefit. On average, Kenyan and Tanzanian agricultural exports to EAC increased by 14.3% and 20.5% respectively.

1. INTRODUCTION
1.1 Background of the Study
Regional Integration, in form of Regional Trade Agreements (RTAs), has always been viewed as a major policy tool that a country can use to climb the ladder of industrialization and economic growth and attain better social welfare for its citizens. They provide an alternative platform for agreement on contentious issues that hinder the multilateral trade negotiations of the World Trade Organization (WTO), are also known to advance the cause of trade liberalization and lead to freer markets by reducing or eliminating tariffs and some non-tariff trade barriers among member states, even though at the risk of diverting trade away from non-member states (Vollrath, 1998). RTAs, therefore, do have both positive and negative effects on trade depending on how they are designed and implemented. According to WTO, EAC is one of the 350 RTAs in force today.

Agriculture, which accounts for 33% of the EAC GDP, plays a central role in the lives of the poor and rural populace, both as the main source of their livelihoods and income, and as their main consumption expenditure, given that about 40% and 83% of the EAC populace are poor and live in rural areas, respectively. Since trade and agriculture are inextricably related, trade has implications on poverty and food security. Agricultural growth and agricultural trade are therefore seen as necessary factors for successful economic transformation and industrialization since they ensure food supply, prevent rising food prices, increase real wages and enable utilizations of major natural resources such as land (Byerlee et al., 2005 and CUTS, 2011). International agricultural trade presents opportunity for farmers to export their produce thereby providing incomes and boosting agricultural production. It also affects households’ access to adequate food through its impact on commodity prices, access to markets for producers and labour entitlements (Otieno and Ogalo, 2009).

It is therefore clear that the dynamics and linkages between agricultural trade and rural livelihoods occur in various phases. Firstly, rural households earn higher incomes from production and sale of agricultural goods to non-local markets, and thereby increasing their demand for consumer goods (not necessarily agricultural). Secondly, the higher aggregate demand leads to creation of non-farm jobs and employment diversification, especially in small towns close to agricultural production areas, which in turn (thirdly) absorbs the surplus rural labour, raises demand for agricultural produce and gains boosts agricultural productivity and rural incomes (Evans, 1990).
However, agricultural products are rarely subjected fully to the rules of trade liberalization especially in predominantly agricultural economies. This is because it is believed that full liberalization of trade in agricultural products may aggravate poverty and even lead to food insecurity. Full liberalization of agricultural products may lead to influx of such commodities in the domestic market leading to low returns to local producers and discouraging local production. This may lead to overdependence on imported products, poor food security, increase poverty levels adversely affect the economic growth of agricultural based economies. These factors have made liberalization of agricultural trade to move at a slower pace compared to liberalization in other commodities, Sawkut and Boopen (2009). EAC partner states agreed on commodities that require extra protection over imports from outside the region (EAC, 2008). These commodities include among others sugar, milk, wheat flour, maize, rice, palm oil and textile. Hence whether EAC as a Custom Union has promoted agricultural trade of state members remains an empirical issue.

1.2 Economic Integration in East African Community

The three East African Countries (Kenya, Uganda and Tanzania) have enjoyed a long history of economic integration: custom union between Kenya and Uganda in 1917, which was joined by the main land Tanzania in 1927. EAC collapsed in 1977 owing to perceived trade and industrial benefits imbalances. However, it was re-established in 1999 following successful negotiations and the signing of the treaty by the Heads of States of the three countries. Under the EAC treaty implemented officially in 2001, the first entry point to the community was the establishment of a customs union, then a common market, subsequently a monetary union and ultimately a political federation of the East African States. Rwanda and Burundi were officially admitted into EAC in July 2007.

Progress has been made in liberalizing trade among the member states by establishing a custom union. The East Africa Custom Union (EACU) commenced operations in 2005 following the signing of the protocol establishing it in 2004. As a way of addressing former trade imbalances that resulted to the collapse of the old EAC, member countries resolved to apply the principle of asymmetry in the elimination of internal tariff, whereas the goods from Uganda and Tanzania were to enter Kenya duty-free, whereas the two countries were to impose a tariff at reducing rates on selected imports from Kenya for five years. The protocol establishing the East African Common Market was signed in 2009 and came into force on July 1, 2010. The establishment of the customs union and the common market has continued to pave way for free movement of goods and services, and labour within the region.

The intra-EAC trade remains low, at 9% (compared to EU-66%, EAST ASIA-55%, NAFTA-44%, ASEAN-27% and SADC-13%, World Bank, 2009; Keane et. al., 2010 and Sally 2010) despite the fact that EAC member countries have over the years since the revival of the custom union in 1999 have put more efforts in coming up with policies and strategies to increase transaction and exchange among the member states. The main goal for transforming the EAC into an integrated economic and political entity is underpinned by the desire for the EAC partner states to attain sustainable and equitable growth and development leading to improved standards of living of the people through increased competitiveness, value-added production, trade and investment, (EAC, 2010).

The EAC partner countries ratified the Common Market Protocol, with the aim of increasing trade among member states. Other steps taken by EAC countries to promote trade among the members include; immediate elimination and gradual reduction of tariffs (asymmetrical reduction tariffs which was to reach 0 per cent in January 2010), removal tariff equivalent charges on internal trade, exemption of selected products, establishing and maintaining a Common External Tariff (CET) and elimination of all non-tariff barriers (NTBs) including which was successfully implemented through establishment and operationalization of the National Monitoring Committees (NMCs) on NTBs in all partner states. The NTBs to be eliminated or reduced were categorized into the following eight clusters: custom documentation procedures, immigration procedures, cumbersome inspection requirements, police road blocks, varying trade regulations among the EAC countries, varying cumbersome and costly transiting procedures in the EAC countries, duplication of functions within agencies involved in custom activities and business registration and licensing, (EAC, 2010). EAC main trading partners include industrialized countries (European Union and United States of America), African countries (SADC and COMESA), Asia and Middle East.
2. LITERATURE REVIEW

2.1 Regional Trade Agreements and Intra-Regional Trade Volumes

RTA would be beneficial if on balance it is "trade creating" and harmful if it is "trade diverting" (Viner, 1950). Trade creation occurs if the increased territorial trade as a result of the RTA leads to the shifting of production from less efficient, high-cost producers to more efficient, low-cost producers within the union. But if the effect of increased trade shifts production from low-cost producers outside the trading bloc to high-cost producers within the bloc, this is known as "trade diversion." In general, trade creation means that a regional trade agreement generates trade that would not have existed otherwise. As a result, supply occurs from a more efficient producer of the product. In all cases, trade creation would raise a country's national welfare, while trade diversion would reduce national welfare.

2.2 Agricultural Trade, Gravity Model and RTAs

Paas (2000) used gravity model approach to analyze trade between Estonia and its main trading partners. The gravity equation estimated included variables such as exports and imports (dependent variables), GDP, distance between the capitals and several dummies for various regions/groups or trading areas. Estimating export and import equations separately, Paas found that the independent variables explain more than 70% of the variation in the dependent variables in both gravity equations. The GDP coefficients are positive and the distance coefficients negative, as expected. The coefficients signs of some of some dummies did not correspond to expectations, but all are found to be statistically significant. His gravity model (GM) results seem to support the notion that the existing trade relations between Estonia and Baltic Sea region (one of the trade areas) countries are most favorable for developing Estonian foreign trade. That is, it tends to trade more with partners with high GDP, closer geographically, and belonging to the trade area.

In Africa, the available evidence on the effectiveness of RTAs in promoting intra-African trade is equally mixed. Elbadawi (1997) used gravity model on 1980-84 data and found that the presence of African RTAs increased intra-regional imports by about 31 per cent, on average, without causing trade diversion. However, these arrangements performed worse in the second half of the 1980s, with most of them leading to substantial trade diversion and even reductions in intra-bloc and external overall trade.

Yang and Gupta (2005) analyzed the performance of RTAs in Africa. Using time-series data for the period between 1970 and 2003, they showed that the impact of RTAs on intra-African trade seemed to have been small or insignificant. As a share of the continent's global trade, intra-African trade declined over much of the 1970s before it recovered in the 1980s and the first half of the 1990s. It was not until the early 1990s that intra-African trade recovered to its early 1970 levels. Since the mid-1990s, intra-RTA trade in the major RTAs (SADC, COMESA, ECOWAS, WAEMU, and CEMAC) has also grown erratically relative to their trade with the rest of the world, often showing no obvious trend over time, except WAEMU, whose intra-regional trade has increased in recent years due to the improved performance of the Custom Union (CU). For many RTAs, intra-bloc trade as share of their total external trade remains below intra-African trade as share of total African external trade. However, the researchers also found that econometric evidence that effectiveness of RTAs in promoting intra-African trade was ambiguous, with some RTAs showing positive effects, some negative and others no effect at all. But the study did not isolate the RTAs effects from other factors that affect intra-regional trade. Such isolation requires the use of gravity model technique.

Vollrath (1998) assessed agricultural trade in six RTAs, including AFTA, APEC, ANZCER, CUSTA, MERCOSUR and the EU, using data for 1953-1959 and 1959-1970. The study showed that both APEC and AFTA had neither positive nor negative effect on agricultural trade flows. On the other hand, ANZCER, CUSTA and MERCOSUR were found to be more trade creating than diverting, welfare improving and helped in opening up the member-countries to the world agricultural economy. And EU was found to be more agricultural trade diverting than creating, hence welfare reducing. However, Vollrath's work fell short of describing the estimation technique employed in the study to arrive at the econometric results discussed.
Grant and Lambert (2005) adopted the augmented gravity framework to analyze the effect of regionalism on the volume of agricultural trade. Using a sample of nine (9) agricultural goods in eight (8) RTAs across the world involving 87 countries, they estimated pooled, cross section and time series regressions on the augmented gravity equation for the period between 1985 and 2002. A total of 11 regressions were run, 9 for each individual agricultural product, 1 for all agricultural products and 1 for all non-agricultural products. Out of the 8 RTAs, 3 were in sub-Saharan Africa (that is, SACU, SADC and COMESA) and referred to as ‘Africa’ in the study. They found that in ‘Africa’, 4 of the 9 commodities experienced trade diversion from non-member sources. However, the effects were found to be generally small and in all cases trade diversion did not outweigh trade creation. On the other hand, NAFTA and EU showed significant trade creation effects in 8 and 6 individual agricultural products, respectively.

Vinaye (2009) examined the intra-SADC’s agricultural trade using panel dataset of 68 exporting and 222 importing countries (both SADC members and non-member trading partners) for the period 2000–2007. Vinaye computed several trade indices and estimated the gravity equation using Pseudo Poisson Maximum Likelihood (PPML) technique. The study revealed limited trade complementarily among SADC economies, which implied low potential for intra-regional agricultural trade. This methodology was a significant deviation from the norm where researchers would transform the gravity equation into logarithm form and apply the usual estimation techniques such as OLS or Tobit.

Silva and Tenreyro (2006) argued that the use of OLS or Tobit in estimating gravity model would constitute a misuse of Jensen’s inequality, that is, log-linearizing economic relationships in the presence of heteroskedasticity in the data could lead to biased and inconsistent estimates. They suggested the use of PPML technique as an alternative estimation procedure, which would maintain the gravity equation in its multiplicative form and still yield consistent estimates.

Moghaddasi (2012) studied the relationship between regionalism and Iran’s export of processed agricultural products. Iran is a member of Economic Cooperation Organization (ECO) together with other nine (9) countries. Using generalized gravity model, the study employed panel and pooled data techniques, that is, OLS estimator, one-way Fixed Effects Model (FEM) and one-way Random Effects Model (REM). The results revealed a positive and significant impact of the regionalism on the Iran’s agricultural exports. However, the methodology adopted in this study has been criticized in its ability to give consistent and efficient results in cases where zero trade is reported between the trading partners.

3. METHODOLOGY, EMPIRICAL FINDINGS, CONCLUSION AND RECOMMENDATIONS

3.1 Theoretical Framework, Model Specification and Estimation

Based on the theory of the consumer behaviour, the study used the gravity model developed by Tinbergen (1962) and later augmented by Anderson (1979) and Anderson and Wincoop (2003). Anderson (1979) presented a theoretical foundation for the gravity model based on the constant elasticity of substitution (CES) preferences and goods differentiated by place (country or region) of origin. Two key assumptions in the theoretical derivation of the gravity model include; goods are differentiated by place of origin, and identical and homothetic preferences approximated by a CES utility function. This standard gravity equation tends to ignore many other variables that could have either positive or negative impact on trade volumes between the trading partners, which results to misspecification bias (Vinaye, 2009). To address this problem, the standard approach has been to specify an augmented gravity model by addition of relevant variables to the traditional model, most of which are inspired by theory and motivated by various testable hypotheses (Vinaye 2009). This study specified augmented GM with several variables based on theory and literature reviewed, as in equation below;

\[ \text{EXP}_{ij} = \alpha_0 \text{GDP}_i \text{GDP}_j \text{POP}_i \text{POP}_j \text{EXRT}_{ij} \text{DIS}_{ij} \text{CL}_{ij} \text{AD}_{ij} + \varepsilon_{ij} \]

Transforming the equation above into log-linearized form and take into account the time series;

\[ \log \text{EXP}_{ij} = \alpha_0 + \alpha_1 \log \text{GDP}_i + \alpha_2 \log \text{GDP}_j + \alpha_3 \log \text{POP}_i + \alpha_4 \log \text{POP}_j + \alpha_5 \log \text{EXRT}_{ij} + \alpha_6 \log \text{DIS}_{ij} + \alpha_7 \log \text{CL}_{ij} + \alpha_8 \log \text{AD}_{ij} + \varepsilon_{ij} \]
where: \( i \) represents the exporter country; \( j \) represents the importer country; \( t \) indexes the year; \( EXP_{ijt} \) represents the value of bilateral agricultural export between country \( i \) and country \( j \) in year \( t \); \( GDP_i \) is the GDP level of the exporter country in year \( t \); \( GDP_j \) is the GDP level of the importer country in year \( t \); \( POP_i \) is the population level of the exporter country in year \( t \); \( POP_j \) is the population level of the importer country in year \( t \); \( DIS_{ij} \) is the distance between the exporter and importer; \( CL_{ij} \) is the dummy for common language (taking value of 1 for common language, and 0 otherwise); \( AD_{ij} \) is a dummy representing adjacency between any pair of trading partners (taking value of 1 for adjacency, and 0 otherwise); and \( \varepsilon_{ijt} \) is an error term.

PPML methodology involves writing the conditional expectations of exports in the stochastic equation above, get the equation below.

\[
E[EXP_{ij} | \Omega_{ij}] = \exp\left[ \log \alpha_{0} + \alpha_{1} \log GDP_{i} + \alpha_{2} \log GDP_{j} + \alpha_{3} \log POP_{i} + \alpha_{4} \log POP_{j} + \alpha_{5} \log EXRT_{ij} + \alpha_{6} \log DIS_{ij} + \alpha_{7} \log CL_{ij} + \alpha_{9} \log AD_{ij} \right] + \varepsilon_{ijt}
\]

Where it is assumed that \( E[\varepsilon_{ij} | \Omega_{ij}] = 1 \) and \( \Omega_{ij} \) is the vector of explanatory variables. Assuming that each observation in the above equation is associated with an error term \( \eta_{ij} = EXP_{ij} - E[EXP_{ij} | \Omega_{ij}] \), the augmented gravity equation becomes;

\[
EXP_{ij} = \exp\left[ \log \alpha_{0} + \alpha_{1} \log GDP_{i} + \alpha_{2} \log GDP_{j} + \alpha_{3} \log POP_{i} + \alpha_{4} \log POP_{j} + \alpha_{5} \log EXRT_{ij} + \alpha_{6} \log DIS_{ij} + \alpha_{7} \log CL_{ij} + \alpha_{9} \log AD_{ij} \right] + \eta_{ij}
\]

Where \( EXP_{ij} > 0 \) and \( E[\eta_{ij} | EXP_{ij}] = 0 \).

To evaluate trade creation and/or trade diversion effects of the EAC-RTA, a variable for membership to the EAC was added to the above equation to get the equation below:

\[
EXP_{ij} = \exp\left[ \log \alpha_{0} + \alpha_{1} \log GDP_{i} + \alpha_{2} \log GDP_{j} + \alpha_{3} \log POP_{i} + \alpha_{4} \log POP_{j} + \alpha_{5} \log EXRT_{ij} + \alpha_{6} \log DIS_{ij} + \alpha_{7} \log CL_{ij} + \alpha_{9} \log AD_{ij} + \alpha_{9} EAC_{ij} \right] + \eta_{ij}
\]

Where \( EAC_{ij} \) is a dummy variable indicating the existence of EAC-RTA between countries \( i \) and \( j \). \( EAC_{ij} \) is a binary variable which is unity if both \( i \) and \( j \) belong to the EAC-TRA and zero otherwise - degree of trade creation effects (Sawkut and Boopen, 2009). The final equation above was estimated using the PPML technique. Whether to employ PPML technique under fixed effects or random effects, the Hausman test was performed and random effects model (REM) was found to be most appropriate.

### 3.2 Empirical Findings

Gravity equations involving exports of each member state to other selected 77 trading partners across the globe, the GDP of the exporter and importers, population of the exporter and importers, exchange rates, distance between capital cities, common language dummy, adjacency dummy and a dummy for EAC membership were specified and estimated. The population of the importer was dropped from the estimated equation due to the problems of collinearity and non-stationarity. Regression results are presented in Table 1.

<table>
<thead>
<tr>
<th>Country</th>
<th>Coefficients</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>1.543***</td>
<td>0.002</td>
</tr>
<tr>
<td>Tanzania</td>
<td>3.107</td>
<td>0.176</td>
</tr>
<tr>
<td>Uganda</td>
<td>0.004</td>
<td>0.996</td>
</tr>
<tr>
<td>Rwanda</td>
<td>-4.413***</td>
<td>0.002</td>
</tr>
<tr>
<td>Burundi</td>
<td>-0.626</td>
<td>0.649</td>
</tr>
</tbody>
</table>

**Table 1 (Contd.)**
Table 1 (Contd)

<table>
<thead>
<tr>
<th></th>
<th>GDP importer</th>
<th>POP Exporter</th>
<th>Exchange Rate</th>
<th>Distance</th>
<th>Common Language</th>
<th>Adjacency</th>
<th>EAC</th>
<th>Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log</td>
<td>-0.085</td>
<td>-57.891</td>
<td>0.025</td>
<td>0.018</td>
<td>-0.063*</td>
<td>0.221***</td>
<td>0.143***</td>
<td>3.423***</td>
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<tr>
<td></td>
<td>0.393</td>
<td>0.347</td>
<td>0.074</td>
<td>0.229</td>
<td>0.055</td>
<td>0.000</td>
<td>0.000</td>
<td>700</td>
</tr>
<tr>
<td>11.19***</td>
<td>31.706***</td>
<td>0.021</td>
<td>0.169***</td>
<td>0.000</td>
<td>Dropped</td>
<td>Dropped</td>
<td>Dropped</td>
<td>732</td>
</tr>
<tr>
<td>0.003</td>
<td>0.000</td>
<td>0.720</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td>444</td>
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<tr>
<td>-1.812***</td>
<td>47.203</td>
<td>0.059</td>
<td>-0.001</td>
<td>-0.063*</td>
<td></td>
<td></td>
<td></td>
<td>143</td>
</tr>
<tr>
<td>0.000</td>
<td>0.274</td>
<td>0.273</td>
<td>0.988</td>
<td>0.014</td>
<td></td>
<td></td>
<td></td>
<td>168</td>
</tr>
<tr>
<td>3.827***</td>
<td>20.753***</td>
<td>-0.055</td>
<td>-1.160***</td>
<td>0.014</td>
<td></td>
<td></td>
<td></td>
<td>-1564.938</td>
</tr>
<tr>
<td>0.002</td>
<td>0.007</td>
<td>0.877</td>
<td>0.000</td>
<td>0.000</td>
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</tr>
<tr>
<td>-0.174</td>
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<td>0.001</td>
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</tr>
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<td>0.898</td>
<td>0.244</td>
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<td>0.004</td>
<td></td>
<td></td>
<td></td>
<td>-329.288</td>
</tr>
</tbody>
</table>

***, ** and * denote statistical significance at 1, 5 and 10 percent levels, respectively.

Source: Study Data (2014)

The regression results in Table 1 show that EAC regional trade agreement has different effects on the region’s agricultural exports across the member states. The integration trade diversion effects were evident in case of Rwanda exports. However, the effects were found to be statistically insignificant at all levels. Results from all the other countries show effects of trade creation, with that of Uganda and Burundi being statistically insignificant, while the coefficients of EAC (trade creation dummy) are found to be highly significant at 1% level of significance and with the right positive sign for both Kenya and Tanzania. This implies that Kenya and Tanzania on average tend to export more agricultural products to the EAC region as a result of the regional trade agreement. More specifically, the results show that there is 14.3% increase in Kenyan agricultural exports to EAC as a result of being a member of the RTA, while Tanzania realized 20.5% increase in the agricultural exports to EAC as a result of being a member of the RTA.

4. CONCLUSION AND RECOMMENDATIONS

EAC has marginal effect on the member’s exports of agricultural commodities, the main commodities of trade in EAC. To achieve rural transformation and better livelihoods for rural households in EAC countries through agricultural trade, the EAC Secretariat and the governments of EAC members (especially Burundi and Uganda) need to put more effort liberalizing the intra-EAC agricultural trade, probably formulating and implementing policies that will encourage cross border agricultural trade, accelerate full trade liberalization and strengthen regional trade ties. These may include streamlining tariffs and NTBs.

REFERENCES

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