

# **Liberalization of Services and its Implications on Cross-Border Agricultural Trade in Eastern Africa**

By  
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## **Abstract**

*This study analyses the effects of services liberalization on cross-border trade in agricultural commodities within the East African Community (EAC). Cross-border trade flows in agricultural goods are examined as the agriculture sector still represents an important share of GDP in the EAC region. Trade supporting services are necessary in enhancing agricultural production as well as in marketing and distribution thereby ensuring food security. On average, the services sector presently accounts for about 48.8% of GDP and 34.5% share of total exports in the EAC region. The gravity model was used to establish the impact of trade in services on cross-border trade in maize, beans and rice in the EAC customs union. The rationale is that over and above removal of tariffs and other trade barriers, trade supporting services are an important component of transaction costs, hence influence patterns and volume of cross-border trade.*

*Overall, the empirical results indicate that trade in services significantly influence cross-border agricultural trade in the EAC region. Specifically, an increase in trade in business, insurance and communications services increases cross-border agricultural trade. However, the impacts are insignificant in the case of financial services implying weaknesses in the entrenchment of financial institutions in rural agricultural activities and regulatory restrictions associated with provision of financial services. The study recommends removal of restrictions on services trade to complement the gains from liberalization of agricultural trade in the EAC region. This requires establishment of a regional framework agreement on services that would guide orderly removal of existing regulatory restrictions in the services sector taking into consideration the need to consolidate the envisaged gains of the EAC Common Market.*

**JEL: F13; Q17**

**Keywords:** liberalisation of services, agriculture cross-border trade, East Africa

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## 1.0 Introduction

Over 80% of the population depend on agriculture for their livelihood within the East Africa Community (EAC) region. Agriculture substantially contributes to foreign exchange earnings and employment. The 2<sup>nd</sup> Development Strategy for the East African Community (2001-2005) recognizes that agriculture will continue to be the base for sustainable economic growth and development in the immediate future. This is attributed to the fact majority of the people of East Africa live in the rural areas and derives their livelihood from agricultural production. In addition, most industries are agro-based and use agricultural raw materials as inputs. The export trade of Partner States is dominated by agro-based commodities which constitute about 70% of total exports (EAC, 2008).

However, agriculture is not the only main source of income in rural areas. Indeed, substantial levels of household incomes come from off-farm activities including the provision of various services for the improvement of agriculture (EAC, 2006). In fact, a third of households receive remittances and therefore a general improvement in the economy benefits agricultural households. One of the sectors with potentials to improve agriculture productivity is the services sector which is equally an important component of the economies of EAC Partner States. For example, services exports accounted for 33% of the total exports in both Kenya and Uganda in 2007. During the same period, services accounted for 55% of the total trade in Rwanda, with wholesale and retail contributing for the largest contribution of 11%. In Burundi contribution of service to export trade was 7% while export of services in Tanzania accounted for about 21% of the total trade (EAC Secretariat, 2008).

The services sector has in particular driven the rapid transformation of the retail food sector in the region over the last decade. The agric-food distribution services sector has seen the emergence of modern retail stores (supermarkets, large stores and hypermarkets) increasingly displacing traditional small shops, public markets and government controlled marketing boards in sale and distribution of food and agricultural products (Weatherspoon et al., 2003). Prior to liberalization, many agricultural products in Kenya including maize, tea and coffee were largely sold through marketing boards, which had exclusive rights over production, purchase, distribution and importation (Onyango, 2007). Besides, investment of firms in marketing and distribution services partly explains the dominant role of agricultural exports within the region (Arkell et al., 2005).

The EAC Treaty provides for co-operation to harmonize policies on key services sectors which include; communication, transport, tourism and wildlife, financial service and others. Further, the Agriculture and Rural Development Strategy for the East African Community 2005-2014 (ARDP-EAC-) provides for liberalization of cross-border trade in agricultural produce and products between partner states among other strategies in the bid to ensure availability and access to food to all households among other interventions. However, there are no clear evidence about linkages between cross-border merchandise trade and services trade. Yet the services sector is crucial for improving agriculture productivity, distribution and marketing infrastructure. The growing demand for services in the region can be beneficial to cross-border trade in East Africa which is apparently dominated by agricultural commodities (EAC Secretariat, 2008). Trade supporting services are important in enhancing agricultural production as well as in the marketing and distribution to final consumers and also in ensuring food security. This study therefore focuses on establishing the impacts of trade in services on the EAC cross-border agricultural trade.

This study assessed the impacts of trade in services on cross-border trade in agricultural commodities within the East Africa Community. Services trade play a critical role in the production and marketing of agricultural products. In particular, business services provide direct inputs into agricultural production; transport, logistics, wholesale and retail trade ease the flow of agricultural products between stages of production and from producers to final consumers, while financial services facilitate agricultural production as well as transactions within and across borders. At the global level, services have massively transformed agriculture and food economy while global supply chains strongly influence agricultural production and marketing decisions. For instance, services are the strongest export interest of WTO members like the EU, India and the USA that are the focal point of efforts to liberalize agricultural trade (Gootiiz and Mattoo, 2009). However, the linkage between agricultural trade and services is quite often overlooked especially amongst established regional trade arrangements. According to the WTO Secretariat, only about 17 per cent of the Free Trade Agreements (FTA) notified to the WTO includes commitments to reduce restrictions on services (WTO, 2008).

The rationale for harmonizing domestic services policies derives from the increasing need to reduce trade costs hindering cross-border trade as tariff barriers are lowered. A previous study by the World Bank shows that poor infrastructure and weak institutions contribute to high costs and inhibit agricultural trade (World Bank, 2008). Small land-holding farmers are especially dependent on the efficient and equitable provision of services that enable them to participate in these supply chains on affordable terms. Increased merchandise trade generated through support services lead to improvements in the incomes of farmers, producers and traders in the supply chain. The services sector is also important for providing employment in various EAC Partner States. In Kenya for example, the sector accounts for about 10% of total wage employment while it is still the same sector (particularly the retail trade sector) which is leading in generation of new jobs. In Tanzania, the sector accounts for about 16% of the total employment in the country.

## **2.0 Economic Integration in the East African Community**

### **2.1 Overview of Economies of EAC Partner States**

The five EAC<sup>1</sup> countries have a total area of 1.85 million square kilometres, a combined population of approximately 132 million people and a combined GDP (at current market prices) of US\$ 74.5 billion (World Bank, 2010). All the five countries are currently pursuing market-oriented economic policies and have implemented structural adjustment reforms. Table 1 below shows some selected indicators of the EAC member states. Kenya is the largest of the five economies with a GDP of US\$ 30.2 billion in 2009, a population of 39 million and a per capita income of US\$ 774.6. It is followed by Tanzania, with a GDP of US\$ 22.2 billion, a population of 41 million and a per capita income of US\$ 540. Uganda takes third place, with a GDP of US\$ 15.7 billion, a population of 32.4 million and a per capita income of US\$ 484. The economies of Rwanda and Burundi are the smallest economies of the EAC.

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<sup>1</sup> Kenya, Uganda, Tanzania, Rwanda and Burundi

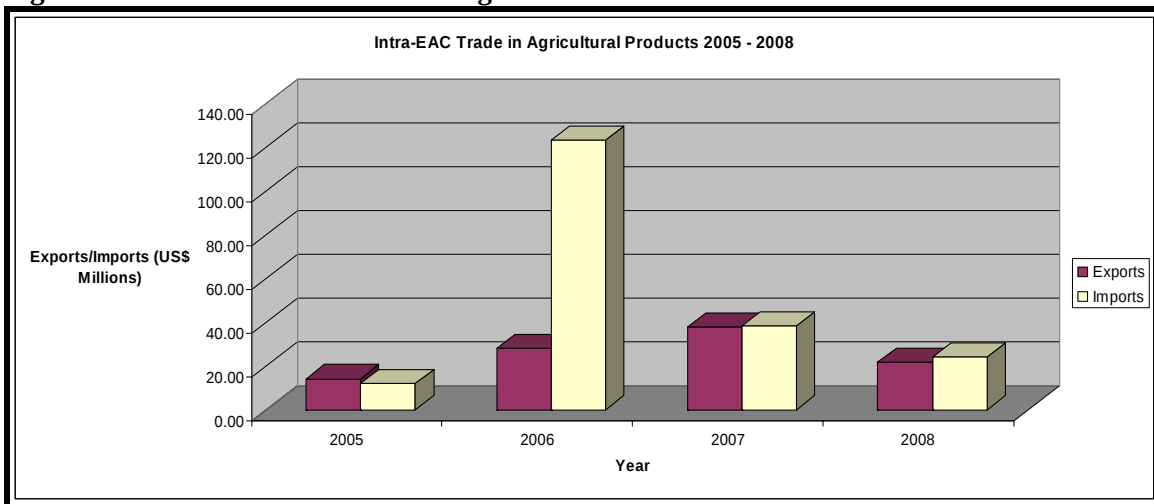
**Table 1: EAC Selected Economic Indicators, 2009**

| Indicators/Country                      | Burundi     | Kenya        | Rwanda      | Tanzania    | Uganda      |
|-----------------------------------------|-------------|--------------|-------------|-------------|-------------|
| Population, total (millions)            | 9.51        | 39.0         | 10.7        | 41.0        | 32.4        |
| Population growth (annual %)            | 3.28        | 2.69         | 2.86        | 2.0         | 2.7         |
| GDP at current prices (US \$ billion)   | 1.41        | 30.2         | 5.01        | 22.2        | 15.7        |
| GDP Growth (annual %)                   | 3.8         | 1.8          | 5.5         | 4.5         | 4.0         |
| Real GDP per capita (US\$)              | 148.2       | 774.6        | 466.2       | 539.8       | 483.8       |
| Inflation rate                          | 14.1        | 20.5         | 14.2        | 11.6        | 12.6        |
| <b>Composition of GDP (%) by sector</b> |             |              |             |             |             |
| Agriculture                             | 33.3        | 21.4         | 42.6        | 26.6        | 22.2        |
| Industry                                | 21.0        | 16.3         | 22.2        | 22.6        | 25.1        |
| <b>Services</b>                         | <b>45.8</b> | <b>62.35</b> | <b>35.2</b> | <b>50.8</b> | <b>52.8</b> |
| <b>Labour force by sector</b>           |             |              |             |             |             |
| Agriculture                             | 93.6        | 75           | 90          | 80          | 82          |
| Industry & Services                     | 6.4         | 25           | 10          | 20          | 18          |
| Services share of total exports         | 20.4        | 35.2         | 41.9        | 43.8        | 31.2        |

Source: CIA, World Fact Book, 2009; World Bank, 2010

The sectoral distribution of GDP indicates that the services and agriculture sectors contribute important shares of GDP and play important roles in the livelihood in all the EAC partner states. According to the EAC Trade Report, 2008, total intra-EAC trade has been increasing over the years since the launch of the customs union. For instance in 2007, total intra-EAC<sup>2</sup> trade increased by 22% reaching US\$ 1.973.2 billion on account of increased exports and imports. This was mainly attributed to increase in exports and imports from Kenya and Uganda where total trade increased by 27.1% and 42%, respectively. Overall, Kenya continued to dominate the EAC regional trade, accounting for 51.6% of total volume of trade.

Furthermore, cross-border trade in agricultural commodities is significant in the EAC region and has been increasing over the years. For instance, total intra-EAC trade in agricultural commodities increased by about 76% from US\$ 26 million to US\$ 46 million between 2005 and 2008 as indicated in the table below.

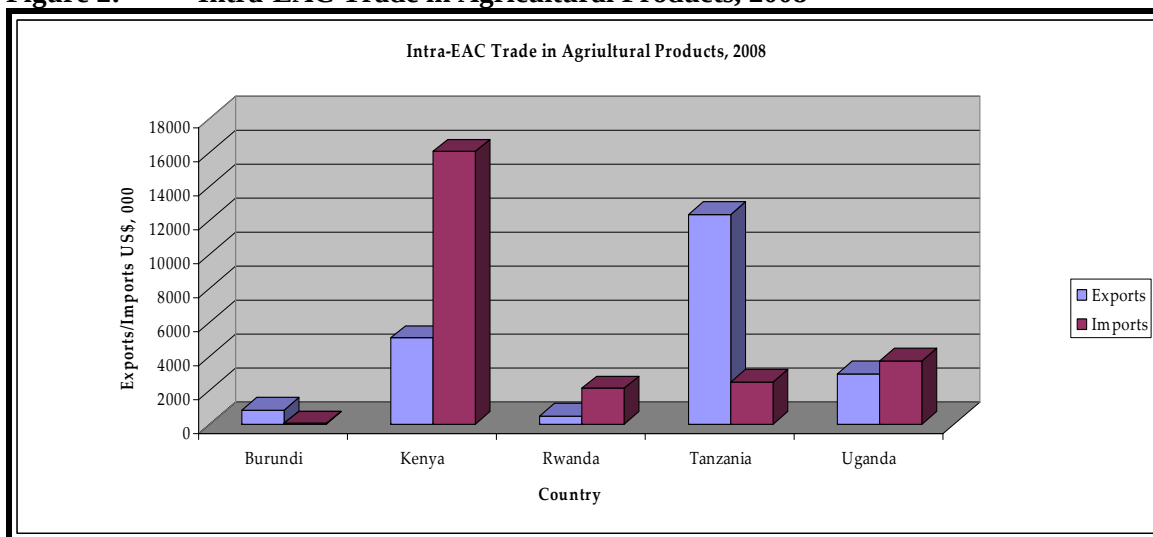
**Figure 1: Intra-EAC Trade in Agricultural Products 2005 - 2008**

Source: COMSTAT Data base

<sup>2</sup> Intra-EAC trade for Kenya, Tanzania and Uganda.

During 2008, most of the exports of agricultural were from Tanzania and Kenya, while agricultural imports were highest in Kenya and Uganda. Besides, it is notable that Kenya imported more agricultural products than all the other EAC Partner States combined.

**Figure 2: Intra-EAC Trade in Agricultural Products, 2008**



Source: COMSTAT Data base

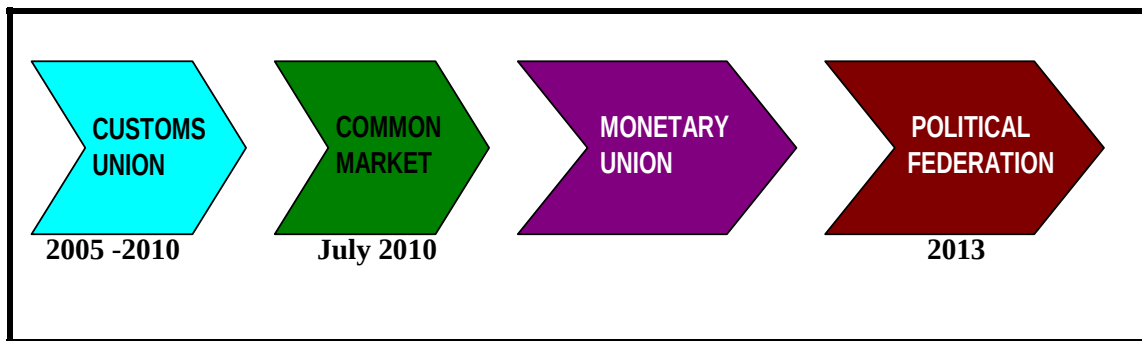
Besides, monitoring surveys indicate that informal agriculture exports constitute a significant share of cross-border trade flows especially for maize, beans, rice, groundnuts, fish and bananas etc. According to the Regional Agricultural Trade Intelligence Network (RATIN), cross-border trade in maize, rice and beans increased by 65% between 2004 and 2006 with maize being the most traded commodity. Informal exports were mainly destined to Kenya and the top five exported products included maize, fish, beans, groundnuts and bananas (ASARECA, 2009).

## 2.2 The EAC Integration Agenda

The treaty establishing the East African Community was signed in 1999 and formally launched in 2001 replacing the East Africa Cooperation of 1993 -1999. The founder members of the Community were Kenya, Uganda and Tanzania. The former co-operation arrangements mainly provided for the delivery of common services such as railways, telecommunications, some research, higher education, harbours, airways and common currency.

The objectives of the community are to develop policies and programmes aimed at widening and deepening co-operation among the partner states in political, economic, social and cultural fields, research and technology, defence, security and legal and judicial affairs, for their mutual benefit. In order to realize their objectives, the EAC partner states developed a roadmap for the integration process with the customs union as the entry point, followed by a common market, monetary union and ultimately a political federation as shown in figure 1.

**Figure 3: Stages of the EAC integration process**



Source: EAC Secretariat (2008)

The framework for development of agriculture in the EAC is contained in the Agriculture and Rural Development Strategy for the East Africa Community (ARD-EAC) whose overall objective is the achievement of food security and rational agricultural production. The Partner States have therefore undertaken to adopt a scheme for the rationalization, improvement and commercialization of agricultural production and rural development with a view to promoting complementarity and sustainability of rural life. The strategy seeks to improve both farm and off-farm activities in order to facilitate the process of sustainable rural development. While recognizing the importance of trade between Partner States for economic growth and development, it puts emphasis on liberalization of cross-border trade in agricultural produce and products between partner states among other strategies in the bid to ensure availability and access to food to all households among other interventions (EAC, 2006).

The EAC customs union came into force in 2005<sup>3</sup> having initially been signed by the three partner states and later joined by Burundi and Rwanda in 2007. The EAC adopted a three-band tariff structure i.e. 0% for meritorious goods, raw materials and capital goods; 10% for intermediate goods and 25% for consumer goods. Besides, they agreed on asymmetric, 5-year transitional period in implementing the customs union in order to address economic imbalances that existed amongst the partner states. Indeed, there has been a general increase in cross-border merchandise since the launch of the customs union. For instance, total intra-EAC<sup>4</sup> trade increased by 30% from US\$ 1,977.9 millions to US\$ 2,559.4 millions between 2005 and 2007, respectively (EAC, Secretariat, 2008).

### **2.3 Services Trade in the EAC Partner States**

The services sector has been considered as a crucial sector in the attainment of economic development goals and targets in the EAC region. Apart from seeking co-operation in harmonization of policies, joint development, standardization and testing, the EAC treaty also seeks harmonization of policies in services sectors like: communication, transport, tourism, financial related education, health, culture and sports, environmental management. The services

<sup>3</sup> The EAC Heads of State signed the EAC Common Market Protocol on 20<sup>th</sup> November, 2009. The Protocol which shall enter into force on 1<sup>st</sup> July 2010 entails free movement of goods, labour, services, capital and the right of establishment.

<sup>4</sup> EAC customs union initial members were Kenya, Uganda and Tanzania. Burundi and Rwanda later joined in 2007 but not yet fully implementing.

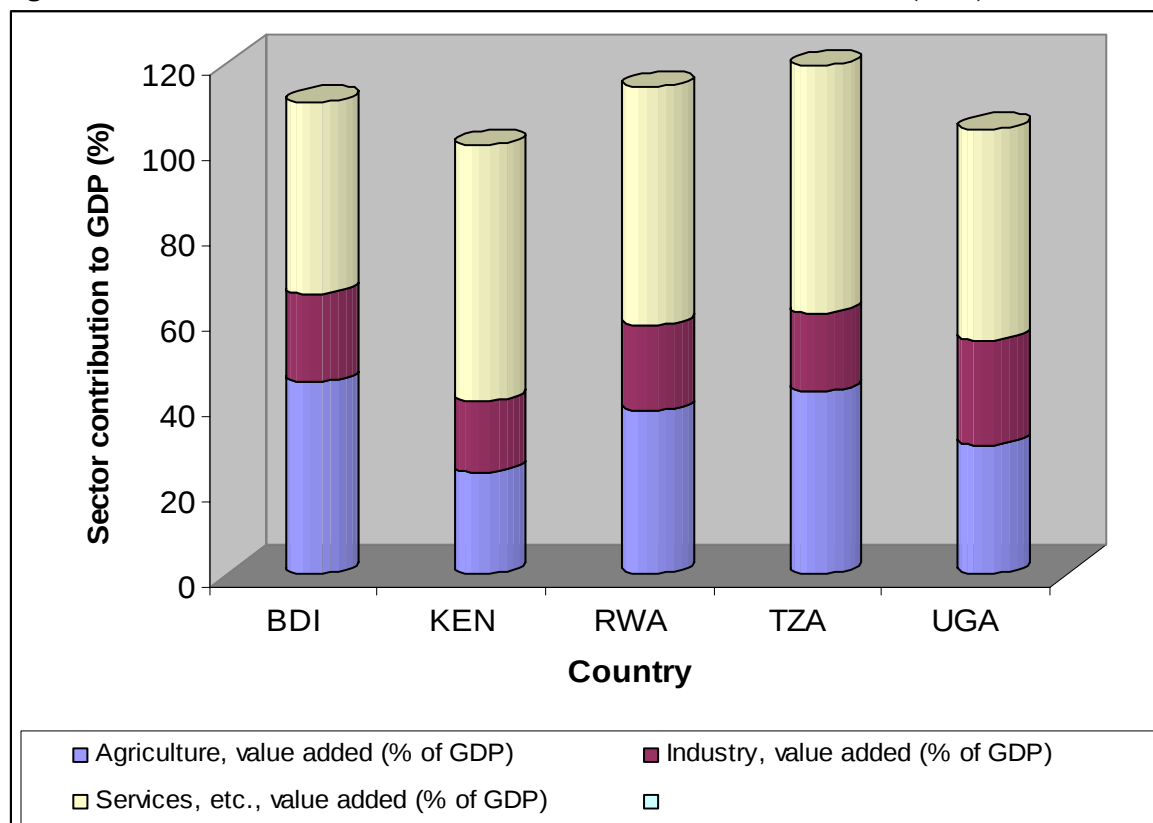
sector also play an important role in fostering cross-border trade of staple food commodities which have direct impact on regional food security.

For instance, the financial and communication services in Burundi have been recognized as key drivers of the economy. In Kenya, out of the six priority sectors identified as crucial in the attainment of the vision 2030 objectives, four of them are service sectors including tourism, wholesale and retail trade, business process outsourcing and financial services. In addition, Kenya aspires to be interconnected through a network of roads, railways, ports, water and sanitation facilities and telecommunications (Kenya Vision 2030).

In Rwanda, service sector has been identified as a crucial sector in attaining the country's development goals. Likewise in Tanzania education services, health and social services, transport and communications, services incidental to utilities (water and energy), environmental services, and infrastructure development have been prioritized in various development policies as important sectors in attainment of Tanzania development policy. In Uganda, communication and transport have been identified as key drivers to economic development.

Globally the services have been the fastest growing sector. This has also been the case in the EAC region. The service sectors share to GDP in Kenya Rwanda Tanzania and Uganda is over 50% while in Burundi is 45% as indicated on the Figure 2.1.

**Figure 4: EAC Partner States Service Sector Contribution to GDP (2007)**

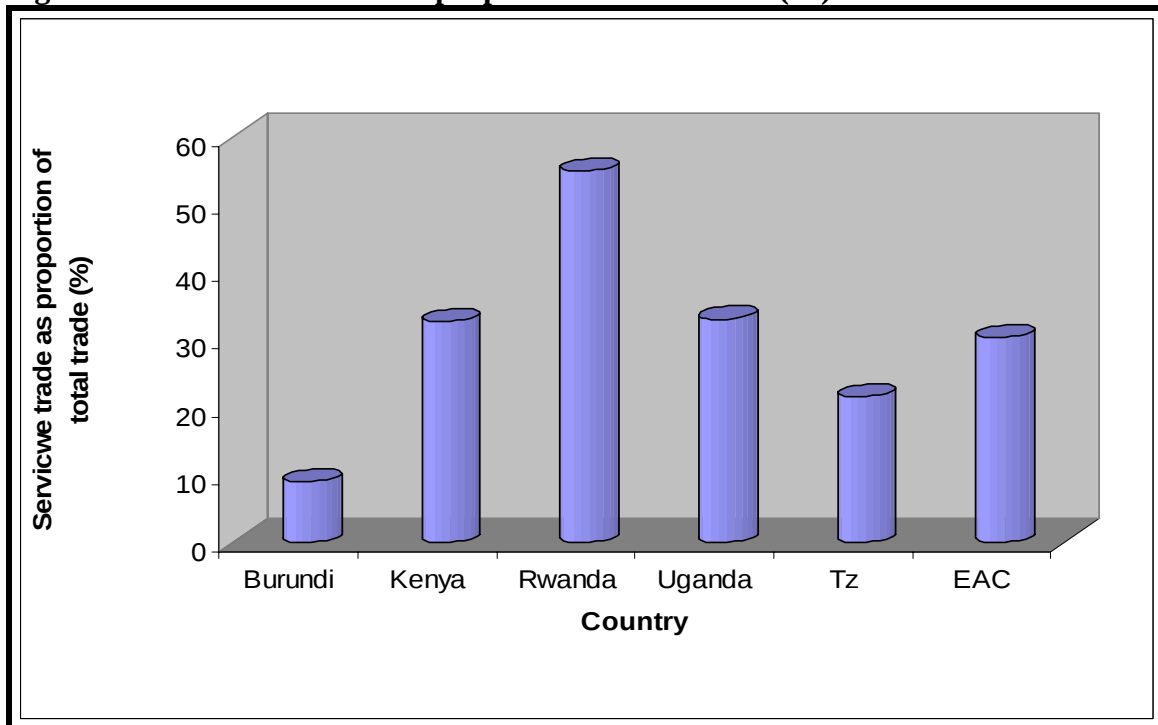


Source: World Fact Book, 2008 and Partner States Statistics' Bureau.

For the EAC region on average, services trade accounted for about 30% of the total regions exports in 2007. The value of services exports accounted for over 62% of the total exports of the region in 2007, while the value of services imports accounted for over 16% of the total imports.

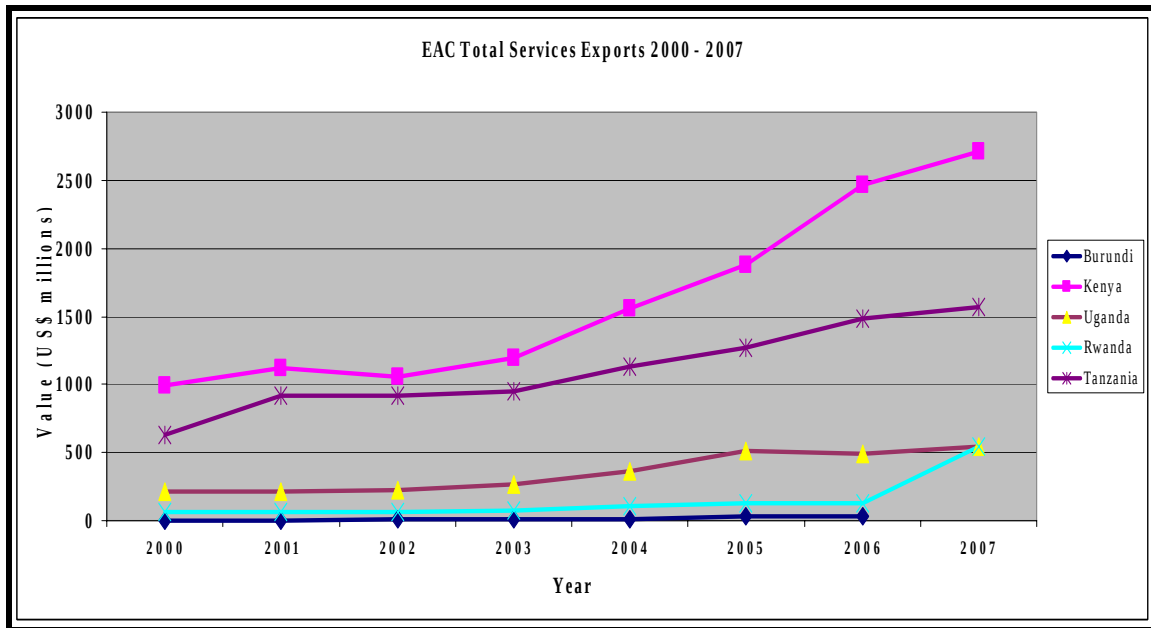
Trade in services is an important component of the EAC Partner States economies. In 2007, services exports accounted for 33% of the total exports in both Kenya and Uganda, while they accounted for 55% of the total trade in Rwanda, with wholesale and retail contributing accounting for the largest contribution of 11%. In Burundi contribution of services to export trade was 7%. For Tanzania, export of services alone accounted for about 21% of the total trade (Figure 2.2).

**Figure 5: Services trade as proportion of total trade (%)**



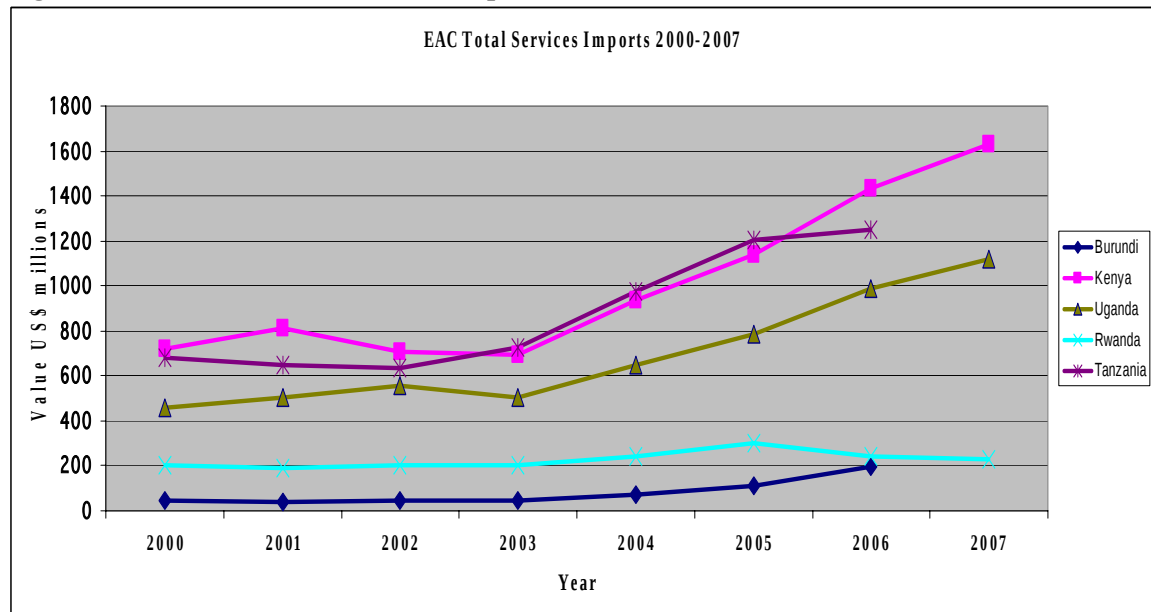
Source: *World Fact Book, 2008 and Partner States Statistics' Bureau*

**Figure 6: EAC Total Services Exports 2000 -2007**



Source: UNCTAD, 2009

**Figure 7: EAC Total Services Imports 2000 -2007**



Source: Author's computation, 2009

The services sector is also important for providing employment in various EAC Partner States. In Kenya for example, the sector accounts for about 10% of total wage employment while it is still the same sector (particularly the retail trade sector) which is leading in generation of new jobs. In Tanzania, the sector accounts for about 16% of the total employment in the country.

### **3.0: Analytical Background**

#### **3.1 Theoretical Literature**

International trade is explained by a number of standard theories. In particular, the gravity model laid the theoretical foundation for estimation of the impacts bilateral trade (Tinbergen, 1962; Anderson, 1979; Bergstrand, 1985; Baldwin and Taglioni, 2006). The model has also been used to establish the link between services trade and trade in goods. In this case, reductions in the cost of traded or trade support services has similar effects as a reduction in tariff protection i.e. it leads to an increase in the quantity of goods traded.

In the context of international trade flows, the gravity model states that the size of trade flows between two countries is determined by supply conditions at the origin, the demand conditions at the destination and stimulating or restraining forces related to the trade flows between the two countries (Serlenga, 2004). In this model, the core explanatory variables used to explain the volume of trade across a pair of countries are measures of economic size of trading partners and the distance between them and other augmented variables. The scope and application of gravity models have also been expanded from goods to cover trade in services as well.

This study draws largely from Deardorff (2001) which uses a partial equilibrium trade model to illustrate the connection between trade in services and trade in goods. In this model, reduction in the cost of transportation services has similar effects as a reduction in tariff protection i.e. it leads to an increase in the quantity of goods traded. This follows the assumption that trade is not costless and that traders purchase certain trade services such as transport, financial, communication services which add to domestic cost of imported goods.

Deardorff (2001) uses the trucking example in developing the cross-border services trade model. Assuming that prior to liberalization of transportation services, truckers from adjacent countries are not allowed to operate across the border. If a good needs to be shipped by truck between the two countries, first, it has to be carried to the border in one country's trucks, unloaded, reloaded onto the other country's trucks and shipped from the border to its final destination. According to Deardorff (2001), allowing cross-border provision of transportation will bring down the costs of this arrangement for a number of reasons, including comparative advantage associated with replacement of service providers in both countries with lower-cost providers from either of the two countries or a different country; elimination of fixed costs following the switching from two services providers to one; reductions in regulatory costs, economies of scale and distance; and reductions in time etc.

The closest antecedent to this paper is Blyde & Sinyavskaya (2007) who explored whether liberalization of trade in services is beneficial for in international trade in goods. Using a dataset of 62 countries for the period 1980- 1999, they found out that trade in transportation and communication services generate the largest impacts on trade in goods. They also investigated the impact of trade in services on the trade of different types of goods and found that trade in services is important to facilitate trade in goods in all the categories.

### 3.2 Empirical Model

The purpose of this study is to estimate the effects of international trade in services on agricultural trade in East Africa. In that respect, the conventional gravity model for bilateral trade flows was employed. In this model, bilateral trade flows is given as

$$X_{ij} = G \frac{Y_i^\alpha Y_j^\beta}{D_{ij}^\delta} \dots\dots\dots(1)$$

where  $X_{ij}$  represent bilateral trade flows between I and j;  
 $Y_i$  and  $Y_j$  represent countries' masses, usually represent in GDPs  
 $D_{ij}$  represent distance between I and j, and  
 $G$  represents the gravitational constant.

The basic OLS log-linear gravity model is specified as

$$L_n(X_{ij}) = C + \alpha L_n(Y_i) + \beta L_n(Y_j) + \delta L_n(D_{ij}) + \varepsilon_{ij} \dots\dots\dots(2)$$

The empirical works are often augmented by extra conditioning variables including monetary and bilateral or multilateral trade costs to account for as many factors as possible (Rose, 2000; Anderson and Van Wincoop, 2003). Thus in addition to the standard gravity models<sup>5</sup>, augmented models take the following general forms:-

$$L_n(X_{ij}) = C + \alpha L_n(Y_i) + \beta L_n(Y_j) + \delta L_n(l\tau_{ij} + lMR_i + MR_j) \dots\dots\dots(3)$$

where  $\tau$  represents trade costs and MR or multilateral resistance of various forms of trade costs, including natural barriers (distance, adjacency, land border etc), man-made barriers trade costs (trade agreements, common currency etc) and cultural barriers (common language, religion etc) . Gravity model estimations give consistent results with respect to income and distance as far as trade flows between countries are concerned i.e. the elasticities are positive and negative for the two standard variables respectively but mixed for the other variables.

Likewise, additional variables including those seeking to measure the impacts of economic integration and trade in services are added into the study model as follows:-

$$\begin{aligned} Ln(X_{ij})_t = & \beta_o + \beta_1 \ln(GDP_i GDP_j)_t + \beta_2 \ln(GDP_i GDP_j / Pop_i Pop_j)_t \\ & + \beta_3 \ln(Dist_{ij}) + \beta_4 \ln(Lang_{ij}) + \beta_5 \ln(landlocked_{ij}) \\ & + \beta_6 \ln(Border_{ij}) + \beta_7 \ln(s_i s_j)_t + \beta_8 \ln(EACU_{ij})_t + \varepsilon_{ij} \dots\dots\dots .(4) \end{aligned}$$

where i and j denote countries, t denotes time and the variables are defined as follows:

- $X_{ij}$  is the real bilateral total agricultural trade between countries i and j;
- GDP is real Gross Domestic Product;

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<sup>5</sup> Standard gravity models only include income and distance variables.

- Pop is the population;
- $Dist_{ij}$  is the distance between countries  $i$  and  $j$ ;
- $Lang_{ij}$  is a dummy variable which is equal to 1 if  $i$  and  $j$  have common languages;  $Landlocked_{ij}$  is a binary variable which is 1 a country is landlocked 0 0 if not;
- $Border_{ij}$  is a dummy variable which is equal to 1 if  $i$  and  $j$  share a common border;
- $S_{ij}$  is total value services trade; and
- $EACU_{ij}$  is a binary variable denoting 1 if  $i$  and  $j$  are members of the EAC customs union; 0 if not at time  $t$ ; and
- $\varepsilon_{ij}$  represents other influences bilateral trade assumed as well behaved.

The coefficients of interest in this study are  $\beta_7$  and  $\beta_8$ . These coefficients depict the effects of trade in services and customs union membership on agricultural trade flows, respectively and have not been previously estimated for the EAC region. Otherwise, the coefficient  $\beta_1$  is expected to be positive. A higher level of income in the importing country should indicate a higher level of demand for goods either produced domestically or imported, while a higher income level in the exporting country should be positively related to that country's ability to produce more services for export. Nicoletti et. al (2003) show that the supply of services to foreign markets is strongly linked to the availability of inputs in both the domestic and foreign markets. The coefficient  $\beta_2$  may take a positive or negative sign. Population size may have a negative effect on exports if countries export less as they become larger or a positive effect if they export more as they become larger as they are able to achieve economies of scale. A similar effect may occur in imports. Although distance ( $\beta_3$ ) between the importer and exporter is typically expected to have a negative impact on trade in goods, this may not necessarily be the case for services. This is because of variations in the nature of the services and their modes of supply i.e. the significance of distance for those that can be transacted electronically may be very low or insignificant. The coefficients  $\beta_4$ ,  $\beta_5$ , and  $\beta_6$  are for dummies for commonality in language, land-locked and common borders, respectively. All the three are expected to be positively related to the level of trade in agricultural commodities.

Impediments to trade in services take the form of regulations or other measures that effectively limit access of foreign services suppliers to the domestic market, rather than tariffs. This measure is however difficult to estimate particularly with prevailing data constraints. In that regard, restrictions to trade in services will be proxied by total levels of trade in services. The coefficient  $\beta_7$  is expected to be positively related to cross-border agricultural trade i.e. as barriers to trade in services fall, services trade will increase and in turn agricultural trade is expected to rise. Finally, the adoption of a common external tariff and elimination of trade restrictions within the EAC aimed at increasing intra-EAC agriculture trade flows hence  $\beta_8$  is expected to be positive.

### 3.3 Specification Testing

A number of estimation techniques including ordinary least squares (OLS), fixed effects model (FEM), random effects model (REM) and Hausman and Taylor Model (HTM) are applied to the gravity model. First, observations are pooled over five years i.e. 2004 to

2008 in the data set and the model estimated using OLS. Bilateral trade between any pair of countries is however likely to suffer from heterogeneity or influenced by certain unobserved individual effects, which if correlated with explanatory variables result in biased estimates.

In order to control for the unobserved effects that may be correlated with regressors, the FEM and REM are employed. The latter are used to capture the relationships between variables over the period of the sample and control for the possibility that un-observed effects and have been described as the most robust econometric specification of the gravity model of international trade (Laura and Shin, 2004; Cheng and Wall, 2005; Walsh, 2006). Thus, both REM and FEM are estimated and their efficiency compared using the hausman test. The test statistic of 3.08 is greater than the chi-squared critical value of 0.38 hence, the null hypothesis that REM is consistent or there is no correlation among variables is rejected and the FEM considered a better estimator. Further, in order to deal with the problem of multi-collinearity of explanatory variables i.e. the possible influence of bilateral trade on incomes and trade in services, the two stage least squares (2sls) method is used whereby total trade in services is instrumented by GDP per capita and population and the time invariant variable distance. The Sargan and Basman over-identification tests are applied to the instrumental variable regression and both test statistics (Sargan 3.36 and Basman – 2.77) are higher than the critical p-values thus the null hypothesis that the instrumental variables are uncorrelated to residuals is accepted.

### **3.4 Data**

The equation is estimated using a data set of 180 observations on bilateral agricultural trade and trade in services in the five EAC partner states. This involved trade in three commodities, namely beans, maize and rice for which data was available. The statistics on services trade comprised total aggregated as well as specific services trade i.e. business services, insurance services, financial services and communication services for which data was available. The data used spans five years (2004, 2005, 2006, 2007 and 2008). The bilateral trade data for 4 EAC partner states for which the Regional Agricultural Trade Intelligence Network (RATIN) compiled cross-border information has been used. On the other hand, the trade in services data was obtained from the UN Services Trade Statistics Database while the data on common border, language and distance were obtained from the CEPII data bank. The remaining statistics were obtained from the National Bureaus of Statistics and the EAC Secretariat data base.

## 4.0: Results

### 4.1 Descriptive Statistics

The descriptive statistics for the study variables are presented in tables 2 and 3 below as well as the annex tables. In terms of services trade, Kenya recorded highest means of trade in all categories services except in business services, while Tanzania recorded the highest mean for total trade in business services during the period.

**Table 2: Means for services trade by categories(2004-2008)**

| Variable               | Kenya | Rwanda | Tanzania | Uganda |
|------------------------|-------|--------|----------|--------|
| Business services      | 36.61 | 36.14  | 37.09    | 36.52  |
| Insurance services     | 34.94 | 33.24  | 35.11    | 34.99  |
| Financial services     | 34.24 | 33.37  | 33.48    | 32.46  |
| Communication services | 36.21 | 33.29  | 35.04    | 34.82  |

Source: Own estimations

On agricultural trade, maize was the most commonly traded commodity across EAC boundaries reflecting its importance as a staple food followed by beans and rice. In addition, Uganda accounted for the highest value of cross-border trade in agricultural products within East Africa. This is closely followed by Tanzania while Rwanda and Kenya accounted for the least cross-border trade. Uganda and Tanzania have better agricultural productivity potentials compared to the other EAC partner states.

**Table 3: Means for product categories by country (2004 – 2008)**

| Product/Country | Kenya                        | Rwanda                       | Tanzania                      | Uganda                        | Total                        |
|-----------------|------------------------------|------------------------------|-------------------------------|-------------------------------|------------------------------|
| <b>Beans</b>    | 6.91<br>(0)                  | 7.31<br>(1.57)               | 10.98<br>(3.64)               | 12.45<br>(4.63)               | <b>9.41</b><br><b>(3.81)</b> |
| <b>Maize</b>    | 8.34<br>(3.09)               | 6.91<br>(0)                  | 10.25<br>(3.64)               | 13.94<br>(3.82)               | <b>9.87</b><br><b>(4.3)</b>  |
| <b>Rice</b>     | 6.91<br>(0)                  | 6.91<br>(0)                  | 11.91<br>(3.97)               | 6.91<br>(0)                   | <b>8.16</b><br><b>(2.91)</b> |
| <b>Total</b>    | <b>7.40</b><br><b>(1.89)</b> | <b>7.04</b><br><b>(0.91)</b> | <b>11.05</b><br><b>(4.17)</b> | <b>11.09</b><br><b>(4.56)</b> | <b>9.15</b><br><b>(3.77)</b> |

Source: Own estimations

Standard deviations are in parenthesis

## 4.2 Pooled Panel Estimates

The econometric results for estimating the basic gravity model are contained in table 4. The model explains 22% of the variations in bilateral agricultural trade flows within the EAC countries. The correlation test indicates high positive correlation between trade in services and GDP, GDP per capita, distance and landlocked variables (see annex Table 10). In the pooled regression, all coefficients have the expected signs i.e. GDP per capita, total services trade, language, common border and membership to customs union, positively influence bilateral trade in agricultural commodities while distance is negatively related to it.

**Table 4: Pooled Panel Estimates 2004 - 2008**

|                                 |                  |
|---------------------------------|------------------|
|                                 |                  |
| GDP per capita                  | 3.52<br>(1.52)   |
| Population                      | 3.07<br>(1.94)   |
| Total services trade            | 1.98<br>(1.63)   |
| EACU                            | 1.71<br>(2.12)   |
| Dist                            | -1.04<br>(-1.01) |
| Language                        | 2.43<br>(3.42)   |
| Landlocked                      | 1.14<br>(1.86)   |
| Common Border                   | 1.03<br>(0.82)   |
| Cons                            | 37.14<br>(0.49)  |
| $R^2 = 0.264$ $Adj R^2 = 0.222$ |                  |

Source: Own estimations

t-statistics in parentheses

From the table, improvements in GDP per capita result in increased bilateral agricultural trade among EAC partner states. This implies that with higher incomes, the purchasing power of consumers' increases thereby enhancing the level of bilateral trade.

The results also indicate that there is more likelihood of bilateral trade facilitated by trade in services. For instance, a 1% increase in total trade in services results into a 2% increase in cross-border trade in the identified agricultural products. This holds true assuming removal of services restrictions reduces transaction costs thereby leading to increased

trade in services. This also signifies the importance of services liberalization in facilitating agriculture cross-border trade beyond the traditional trade facilitation instruments.

The coefficient on membership to the EAC customs union is also positive as expected. Intuitively, this confirms the argument that removal of non-tariff barriers and harmonization of trade policies and regulations enhances regional trade (in this case trade in agricultural products). In addition, this may also be attributed to simplification of customs clearance procedures including the rules of origin requirements.

The results also indicate that language is a critical factor in facilitating intra-EAC cross-border trade. Apart from common understanding of the EAC official languages i.e. English and Kiswahili<sup>6</sup>, communities along border points share common languages, culture and traditions that make it much easier to transact cross-border businesses. On the other hand, population is apparently positively related to cross-border agricultural trade. This implies that as population grows among trading partners demand increases thereby enhancing cross-border trade to meet the demand.

Finally, the intensity of cross-border trade depends on physical distance between trading partners. In other words, there is likely to be more trade between countries which border each other as opposed to those far away from each other. This result also corroborate earlier findings which reported high levels of informal cross-border trade particularly on agricultural products where small quantities of merchandise are carried across border points using bicycles or simply persons implying short distances between suppliers and buyers.

### **4.3 Two Stage Least Square Estimates**

#### **(a) Results from aggregated services**

In this case, the potential influence of income on the measure of services trade are controlled through application of the 2 stage least square estimation method by instrumenting the trade in services variable using GDP, GDP per capita, population and existence of common borders. This allows for elimination of differences in trade in services due to differences in each of these variables across countries. The results for the 2sls are presented in table 5 below. The table also presents sensitivity analysis performed to confirm that the results do not necessarily depend on the exact way the equation is specified and the instruments used. Tests for over-identification and endogeneity are carried out on various specifications and the results presented in column 5 of Table 5 pass the tests. In both cases the null hypotheses are accepted i.e. the instrumental variables are uncorrelated to residuals and all the variables used are exogenous as well.

The results in table 5 are robust and indicate a positive relationship between total trade in services and cross-border trade in agricultural products in the EAC countries. All the

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<sup>6</sup> Burundi and Rwanda also use French as an official language

results are significant at 5 per cent. This is consistent with previous findings and confirms the fact that services facilitate trade in goods within the EAC trading block.

**Table 5: Instrumental Variable Regressions 2004 - 2008**

|                       | 1                            | 2                            | 3                            | 4                            | 5                            |
|-----------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| <b>Total Services</b> | <b>1.42</b><br><b>(3.80)</b> | <b>1.45</b><br><b>(3.90)</b> | <b>1.58</b><br><b>(3.97)</b> | <b>1.38</b><br><b>(4.21)</b> | <b>1.02</b><br><b>(3.18)</b> |
| <b>EACCU</b>          | <b>0.59</b><br><b>(0.84)</b> | <b>0.56</b><br><b>(0.80)</b> | <b>0.44</b><br><b>(0.62)</b> | <b>0.81</b><br><b>(1.24)</b> | <b>0.29</b><br><b>(0.42)</b> |
| Distance              | - 0.78<br>(-0.90)            | -0.81<br>(-0.94)             | -0.95<br>(-1.08)             | -                            | -                            |
| Language              | 1.77<br>(2.65)               | 1.76<br>(2.64)               | 1.74<br>(2.60)               | 2.21<br>(3.76)               | 1.73<br>(2.63)               |
| Landlocked            | 1.07<br>(1.60)               | 1.07<br>(1.61)               | 1.11<br>(1.65)               | 1.39<br>(2.23)               | -                            |
| Border                | 2.12<br>(1.36)               | 2.16<br>(1.38)               | 2.33<br>(1.48)               | -                            | 1.26<br>(1.62)               |
| Cons                  | -48.88<br>(-3.48)            | -49.95<br>(-3.57)            | -54.65<br>(-3.67)            | -51.03<br>(-3.70)            | -35.69<br>(-2.68)            |
| R <sup>2</sup>        | 0.219                        | 0.219                        | 0.215                        | 0.208                        | 0.203                        |
| Adj R-squared         | 0.187                        | 0.186                        | 0.182                        | 0.186                        | 0.181                        |

*t*-statistics in parentheses

Sargan (score) = 5.17338 (p = 0.0753)

Basman chi2 = 5.10813 (p = 0.0778)

Durban (score) chi2 = 2.37657 (p = 0.1232)

Wu-Hausman F(1,144) = 2.31823 (P = 0.1301)

Referring to results presented in column 5, the coefficient of the variable on total trade in services is positive as expected. Thus, a 1% increase in total trade in services leads to 1.02% change in EAC cross-border agricultural trade. In this case, all the services under consideration i.e. business, insurance, financial and communication services facilitate business transactions thereby reducing costs or making it easier and cheaper for traders to transact businesses.

The results however show that customs union variable, though positive is insignificant and does not influence cross-border trade in agricultural commodities. This could be attributed to several factors. First, it could be a pointer to the fact tariff reduction does not affect cross-border trade for the three commodities. By and large, these statistics are not captured or recorded by customs authorities. Previous surveys have established lack or poor recording of cross-border transactions particularly for the three commodities in various border points. This is because many traders under-declare their cargo to avoid having to comply with customs procedures, including completion of rules of origin

certificates. In addition, it could be as a result of traders resorting to informal transactions due to high transaction costs associated with customs clearance and other necessary documents.

Further, the existence of common languages strongly supports cross-border trade in maize, beans and rice. This is explained by the fact that cross-border trade is often conducted among people of the same clan or ethnic group. The communities spread along territorial boundaries share cultural and social norms which provide an incentive to engage in trade in the bid to exploit available opportunities. This is similarly the case in the EAC region where communities share local languages including, speaking the swahili language. The remaining variables also exhibit expected results.

#### **(b) Results by Services Sectors**

I now explore whether the general result that trade in services facilitates bilateral trade in agricultural products applies to any type of services. I differentiate the types of services and use four types of services separately. Table 6 indicates the empirical results for selected services sectors namely communication services, financial services, insurance services and other business services. The results in columns 1, 2, 3 and 4 show the effects of each of the four services introduced separately into the model. Overall, all the coefficients are positive and significant with the exception of the financial services coefficient which is not significant.

From the results, other business services and insurance services have the greatest impacts on cross-border bilateral trade in East Africa. The former includes merchanting, professional and other trade related services all of which are pertinent in business transactions. In this case, a 1 % increase in business services provision would result in 2.93% increases in cross-border agricultural trade in East Africa. Business services are important determinants of trade transaction costs and can determine the extent of productivity, efficiency of clearance procedures and capacities to internalize costs are concerned. Professional services especially with regard to agriculture extensions bear of agriculture productivity and trade. Besides, many small scale traders do not have track records with customs authorities neither do they have capacities to comply with standards and other related requirements.

Similarly, insurance services have significant influence on cross-border agricultural trade. The implication is that insurance increases confidence of traders to get compensations should they incur losses in the course of conducting their businesses. The bulk of selected agricultural products are produced on small scale and on a seasonal basis hence, subject to a number of risks including the vagaries of weather.

**Table 6: Regressions for Specific Services Sectors 2004 - 2008**

|                               | 1                            | 2                            | 3                            | 4                            |
|-------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| <b>Business Services</b>      | <b>2.93</b><br><b>(2.94)</b> | -                            | -                            | -                            |
| <b>Insurance services</b>     | -                            | <b>1.26</b><br><b>(4.10)</b> | -                            | -                            |
| <b>Financial services</b>     | -                            | -                            | <b>0.88</b><br><b>(1.83)</b> | -                            |
| <b>Communication services</b> | -                            | -                            | -                            | <b>0.69</b><br><b>(3.95)</b> |
| <b>EACCU</b>                  | 0.43<br>(0.39)               | 1.19<br>(1.82)               | 1.49<br>(1.31)               | 1.14<br>(1.74)               |
| Distance                      | - 1.52<br>(-1.62)            | -0.16<br>(-0.31)             | -0.95<br>(-1.16)             | -0.58<br>(-1.24)             |
| Language                      | 1.31<br>(1.59)               | 2.22<br>(3.27)               | 1.31<br>(1.11)               | 1.67<br>(2.55)               |
| Landlocked                    | 1.07<br>(1.41)               | 1.34<br>(2.19)               | 2.66<br>(2.06)               | 1.76<br>(2.78)               |
| Border                        | 2.49<br>(2.45)               | 0.33<br>(0.34)               | 0.06<br>(0.03)               | 0.93<br>(1.07)               |
| Cons                          | -90.85<br>(-2.85)            | 35.09<br>(-3.67)             | -36.92<br>(-1.67)            | -21.35<br>(-3.22)            |
| R <sup>2</sup>                | 0.197                        | 0.263                        | 0.194                        | 0.276                        |
| Adj R-squared                 | 0.168                        | 0.231                        | 0.170                        | 0.244                        |

**Source: Own estimations**

There is a positive coefficient for communication services implying communication services like mobile telephones and the internet make it easier for both traders and consumers to exchange market information including demand, supply, prices and other market requirements. Recent developments in the communications sectors, particularly in the mobile telephony in East Africa should therefore be expected to open up greater opportunities for cross-border.

The coefficient for financial services though positive is not significant. This may be attributed to the fact that rural finance institutions are not deeply entrenched in providing rural credit to farmers. The latter especially small scale farmers are often considered unattractive to as clients to commercial banks due to low volumes of loans and high transaction costs. Apart from high risks associated with agriculture productivity, farmers tend to borrow at the same time i.e. during pre-harvest season and lack sufficient collaterals. Thus, in there could be a weak link between the financial and agricultural sector within the EAC region and the constraints in access to credit by farmers and traders in agricultural products.

Another interesting feature of the results is that the variable on membership to the EAC customs Union, though positive, does not significantly affect cross-border trade in agricultural commodities when specific services variables are separately introduced into the model.

## **6.0: Summary and Policy Implications**

Empirical evidence from this and other previous studies support the argument that trade in services can be beneficial to cross-border regional trade. Although the extent and level of cross-border agricultural trade in East Africa is strongly influenced by the income level and population, the impacts from services sectors, including communication, insurance services and other business services is equally strong. Restrictions on cross-border supply of these services may create costs that limit production and cross-border flow of agricultural commodities.

From the regression results, harmonization of services regulations can boost benefits of increased trade in services as well as those from increased cross-border flow of agricultural commodities. An expanded services industry is likely to support, promote and facilitate the development, production and marketing of agricultural produce and products to ensure food security poverty eradication and sustainable economic development. The harmonization of services regulations however requires development of a regional framework agreement on trade in services to facilitate orderly removal of existing restrictions on various services sectors. In addition, the mechanisms for collection or reporting data on services and services-related activities need to be strengthened in the region as a basis for informing appropriate institutional and regulatory reforms.

Apparently, liberalisation of services in individual EAC partner states has been done unilaterally within the broad framework of structural adjustment programmes and also through the WTO commitments under the GATS framework. As the EAC integration process deepens, the establishment of a clear framework for liberalization of trade in services over and above the process of policy harmonization in selected sectors in conformity with the GATS is necessary.

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## ANNEX

### Intra-EAC Trade Flows

**Annex Table 7: Kenya's Trade Performance (US\$ Millions)**

|                                              |                  | Before the Customs Union |                 |                 | After the Customs Union |                 |                 |
|----------------------------------------------|------------------|--------------------------|-----------------|-----------------|-------------------------|-----------------|-----------------|
|                                              |                  | 2002                     | 2003            | 2004            | 2005                    | 2006            | 2007            |
| <b>Exports<br/>(Domestic and re-exports)</b> | Burundi          | 22.83                    | 36.24           | 37.54           | 30.95                   | 32.23           | 39.9            |
|                                              | Rwanda           | 54.77                    | 79.17           | 78.18           | 89.34                   | 110.4           | 137.01          |
|                                              | Tanzania         | 180.079                  | 192.11          | 226.35          | 258.62                  | 319.64          | 396.67          |
|                                              | Uganda           | 397.21                   | 403.87          | 468.08          | 534.82                  | 661.00          | 820.3           |
|                                              | <b>Total EAC</b> | <b>654.89</b>            | <b>711.39</b>   | <b>810.15</b>   | <b>913.73</b>           | <b>1,123.27</b> | <b>1,393.88</b> |
|                                              | <b>ROW</b>       | <b>2,143.97</b>          | <b>2,403.73</b> | <b>2,702.77</b> | <b>3,544.7</b>          | <b>4,102.77</b> | <b>4,845.58</b> |
| <b>Imports</b>                               | Burundi          | 0.008                    | 0.032           | 0.036           | 0.410                   | 1.304           | 1.619           |
|                                              | Rwanda           | 0.073                    | 0.062           | 0.206           | 0.236                   | 0.291           | 0.362           |
|                                              | Tanzania         | 10.19                    | 18.01           | 25.39           | 29.00                   | 35.84           | 44.49           |
|                                              | Uganda           | 8.437                    | 13.66           | 12.77           | 14.59                   | 18.03           | 22.37           |
|                                              | <b>Total EAC</b> | <b>18.71</b>             | <b>31.76</b>    | <b>38.41</b>    | <b>44.24</b>            | <b>55.47</b>    | <b>68.84</b>    |
|                                              | <b>ROW</b>       | <b>3,770.23</b>          | <b>3,709.68</b> | <b>4,591.2</b>  | <b>6,826.62</b>         | <b>8,227.45</b> | <b>10,324.6</b> |
| <b>Trade Balance</b>                         | <b>Total EAC</b> | <b>636.18</b>            | <b>679.63</b>   | <b>771.74</b>   | <b>869.49</b>           | <b>1,067.8</b>  | <b>1,320.04</b> |

Source: IMF Statistics

**Annex Table 8: Uganda's Trade Performance (US\$ Million)**

|                                              |                               | Before Customs Union |                |                | After Customs Union |                |                |
|----------------------------------------------|-------------------------------|----------------------|----------------|----------------|---------------------|----------------|----------------|
|                                              |                               | 2002                 | 2003           | 2004           | 2005                | 2006           | 2007           |
| <b>Exports<br/>(Domestic and re-exports)</b> | <b>Country of Destination</b> |                      |                |                |                     |                |                |
|                                              | Burundi                       | 6.3                  | 10.1           | 18.1           | 20.8                | 20.6           | 42.8           |
|                                              | Kenya                         | 61.5                 | 78.4           | 76.9           | 72.4                | 88.0           | 118.2          |
|                                              | Rwanda                        | 12.9                 | 20.8           | 24.7           | 36.1                | 30.5           | 83.3           |
|                                              | Tanzania                      | 5.8                  | 5.8            | 12.2           | 15.5                | 13.8           | 30.6           |
|                                              | <b>Total</b>                  | <b>86.4</b>          | <b>115.1</b>   | <b>131.9</b>   | <b>144.8</b>        | <b>152.8</b>   | <b>274.8</b>   |
|                                              | <b>ROW</b>                    | <b>381.2</b>         | <b>419.0</b>   | <b>553.2</b>   | <b>668.1</b>        | <b>809.4</b>   | <b>1,061.9</b> |
| <b>Imports</b>                               | Burundi                       | 0.01                 | 0.03           | 0.07           | 0.2                 | 0.2            | 0.7            |
|                                              | Kenya                         | 312.9                | 357.3          | 400.0          | 521.0               | 400.6          | 494.9          |
|                                              | Rwanda                        | 1.4                  | 0.5            | 0.6            | 0.5                 | 0.5            | 3.8            |
|                                              | Tanzania                      | 7.5                  | 10.8           | 15.8           | 30.1                | 28.7           | 30.8           |
|                                              | <b>Total</b>                  | <b>321.8</b>         | <b>368.6</b>   | <b>416.4</b>   | <b>551.8</b>        | <b>430.0</b>   | <b>530.2</b>   |
|                                              | <b>ROW</b>                    | <b>751.5</b>         | <b>1,006.5</b> | <b>1,309.8</b> | <b>1,502.3</b>      | <b>2,127.3</b> | <b>2,965.2</b> |
| <b>Trade Balance</b>                         |                               | <b>-235.4</b>        | <b>-253.5</b>  | <b>-271.6</b>  | <b>-407.0</b>       | <b>-277.2</b>  | <b>-255.4</b>  |

Source: Uganda Bureau of Statistics

**Annex Table 9: Tanzania's Trade Performance (US \$ million)**

|                      |        | Before Customs Union |      | After Customs Union |       |       |       |
|----------------------|--------|----------------------|------|---------------------|-------|-------|-------|
|                      |        | 2003                 | 2004 | 2005                | 2006  | 2007  | 2008  |
| <b>Total exports</b> | Kenya  | 84.5                 | 90.1 | 93.3                | 103.9 | 126.5 | 231.5 |
|                      | Uganda | 48.7                 | 55.7 | 48.9                | 44.0  | 46.1  | 53.8  |

|                      |        |         |         |         |         |         |         |
|----------------------|--------|---------|---------|---------|---------|---------|---------|
|                      | EAC    | 133.2   | 145.8   | 142.2   | 147.9   | 172.6   | 285.3   |
|                      | ROW    | 1,025.7 | 1,196.0 | 1,444.8 | 1,593.7 | 1,859.4 | 2,416.9 |
| <b>Imports</b>       | Kenya  | 117.8   | 131.5   | 174.7   | 156.9   | 113.6   | 197.9   |
|                      | Uganda | 8.3     | 7.7     | 6.5     | 5.4     | 6.5     | 6.4     |
|                      | EAC    | 126.1   | 139.2   | 181.2   | 162.3   | 120.1   | 204.3   |
|                      | ROW    | 1,808.3 | 2,240.0 | 2,856.0 | 3,801.0 | 5,140.2 | 6,048.9 |
| <b>Trade Balance</b> |        | 7.1     | 6.6     | -39.0   | -14.4   | 52.5    | 81.0    |

*Source:* National Bureau of Statistics

**Annex Table 10: Correlation Matrix**

|                   | <b>Ltrade</b> | <b>Ltt</b> | <b>Lgdp</b> | <b>Lpop</b> | <b>Ldist</b> | <b>Lry</b> | <b>border</b> | <b>language</b> | <b>landlocked</b> |
|-------------------|---------------|------------|-------------|-------------|--------------|------------|---------------|-----------------|-------------------|
| <b>Ltrade</b>     | 1.000         |            |             |             |              |            |               |                 |                   |
| <b>Ltt</b>        | 0.3263        | 1.000      |             |             |              |            |               |                 |                   |
| <b>Lgdp</b>       | 0.3186        | 0.7967     | 1.000       |             |              |            |               |                 |                   |
| <b>Lpop</b>       | 0.3670        | 0.9229     | 0.7108      | 1.000       |              |            |               |                 |                   |
| <b>Ldist</b>      | 0.2037        | 0.4679     | -0.0379     | 0.5942      | 1.000        |            |               |                 |                   |
| <b>Lry</b>        | 0.3754        | 0.9422     | 0.8778      | 0.9609      | 0.3898       | 1.000      |               |                 |                   |
| <b>Border</b>     | 0.2608        | 0.2085     | -0.0335     | 0.3949      | 0.7915       | 0.2558     | 1.000         |                 |                   |
| <b>language</b>   | 0.2627        | -0.0307    | -0.0100     | -0.0344     | 0.0496       | -0.0238    | 0.2994        | 1.000           |                   |
| <b>landlocked</b> | -0.0306       | -0.4457    | -0.2878     | -0.4037     | -0.2628      | -0.3882    | -0.000        | 0.000           | 1.000             |

No. of observations = 180

**Annex Table 11: Summary Statistics**

| <b>Variable</b>         | <b>Obs</b> | <b>Mean</b> | <b>Std. Dev.</b> | <b>Min</b> | <b>Max</b> |
|-------------------------|------------|-------------|------------------|------------|------------|
| Trade                   | 180        | 9.14        | 3.76             | 6.91       | 19.45      |
| GDP per capita          | 180        | 16.25       | 0.40             | 16.92      | 15.51      |
| Population              | 180        | 34.03       | 0.67             | 33.09      | 35.01      |
| Total trade in services | 150        | 42.12       | 1.08             | 39.85      | 44.03      |
| EACCU                   | 180        | 0.6         | 0.49             | 0          | 1          |
| Distance                | 180        | 6.43        | 0.69             | 5.19       | 7.06       |
| Language                | 180        | 0.33        | 0.47             | 0          | 1          |
| Landlocked              | 180        | 0.5         | 0.5              | 0          | 1          |
| Common border           | 180        | 0.75        | 0.43             | 0          | 1          |

*Source:* Own estimations