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Comparing the Performance of Uganda's Intra-East African Community Trade and Other Trading Blocs: A Gravity Model Analysis

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ABSTRACT

This paper examines factors that determine Uganda's trade flows and specifically compares the impact and performance of the different trade blocs on Uganda's trade patterns and flows. The empirical question is whether Uganda's trade is getting more integrated in the East African Community (EAC) region or is still dominated by other trading blocs, namely European Union (EU), Asia and Common Market for Eastern and Southern Africa (COMESA)? Two analytical approaches are used, namely: trade indicators and estimation of the gravity models using data extracted from COMTRADE for the period 2001 – 2009 (panel). We estimate determinants of export and import trade flows separately using static random, dynamic random and IV GMM models. The results suggest a strong relationship between belonging to a trading bloc and trade flows. Likewise, Uganda's import and export trade flows have conspicuously adjusted to the gravitational forces of the EAC during the progress of the integration. Whereas exports are being integrated more in the EAC and COMESA regions, imports are more integrated in the Asian and EU trading blocs. Therefore, strong links with trading blocs outside the EAC (i.e. EU and Asia) with regards to imports still exist. The trade indicators demonstrate that Uganda exports largely primary products and imports manufactured products. It is imperative for Uganda to target implementation of regional trade agreements to expand the country's export markets. The EAC region should attract investment in production of high technology products to increase intra-EAC imports and reduce imports from Asia and the EU.

Key words: *Gravity model, imports, exports, intra, trade intensity index, trade indices, trade flows, trade shares, blocs, regional integration, panel, random and fixed effects.*

1. INTRODUCTION

The East African countries of Uganda, Kenya and Tanzania have a strong historical relationship characterized by phases of economic and political cooperation that date back to the early twentieth century (Shinyekwa and Othieno 2011). The latest phase is the treaty that established the East African Community (EAC) in 2000 with the Republic of Uganda, the Republic of Kenya and the United Republic of Tanzania being the initial members. Membership to the EAC has grown to five partner states after Burundi and Rwanda joined the EAC in July 2007 and there are prospects of South Sudan joining the community in the near future.

The main objective of the EAC is to attain economic, social and political integration in East Africa. The Customs Union (CU) protocol highlights the commitment of Partner States to support export promotion schemes in the community to accelerate development, promote and facilitate export oriented investments, produce export competitive goods, promote export schemes and attract foreign direct investment. The removal of tariffs on intra-regional trade also referred to as Internal Tariffs (IT) and the efforts to reduce Non-Tariff Barriers (NTBs) and improvement in trade facilitation are among the on-going initiatives to boost intra-EAC trade. Ideally, formation of a CU should increase intra-trade within the EAC implying that Uganda's trade with the EAC partner states should increase both proportionally and in value terms. While this is the intention among the EAC regional economic integrating countries, there is a tendency to trade more with countries outside the regional bloc than among partner states as will be discussed latter. This is as a result of weak infrastructure; supply side constraints, limited value addition capacity and poor road connectivity that have remained a major impediment to increase in intra-regional trade. There is also the phenomenon of overlapping membership that poses a challenge given the divergence in the respective trade regimes. It may discourage rather than promote greater trade liberalization within the EAC trading bloc as it is diversionary in nature and problematic[1].

Trade liberalization has been an important part of East Africa's policy agenda since the countries embarked on several structural adjustment efforts. The emphasis during the 1990s was on multilateral liberalization, with both import tariffs and quantitative restrictions (for example quotas) falling dramatically. However, the pace of multilateral reforms slowed at the end of the last decade and the countries shifted their liberalization efforts in favour of bilateral and regional agreements with major trading partners[2]. Although Uganda has the liberty to further liberalize trade within the EAC framework, the key question is the extent to which Uganda's trade is getting integrated in order to reap the benefits especially after forfeiting customs revenue. Tariff revenues make substantial contribution (on average 11

1 Uganda belongs to both COMESA and EAC and Tanzania a member of the EAC is also a member of the South African Development Cooperation (SADC).

2 This could be a results of the stalled WTO negotiations of the Doha Round that has led to proliferation of bilateral agreements globally

percent[3]) to total tax revenues for Uganda, whose removal puts more pressure on the country to meet fiscal responsibilities. If the country is not integrating its trade within the EAC, in order to benefit from the gains, then foregoing customs revenue is a loss.

The paper applies the gravity model to establish the determinants of Uganda's trade flows. Specifically, the paper seeks to establish whether Uganda's trade is getting more integrated into the EAC region or is still dominated by other trading blocs. To what extent has Uganda taken advantage of the reduction in tariffs on intra-EAC regional trade and the reduction of non-tariff barriers to expand the country's regional trade? What is the nature of Uganda's regional and global traded products? This paper contributes to informed policy formulation for Uganda to deepen the county's regional trade integration within the EAC context.

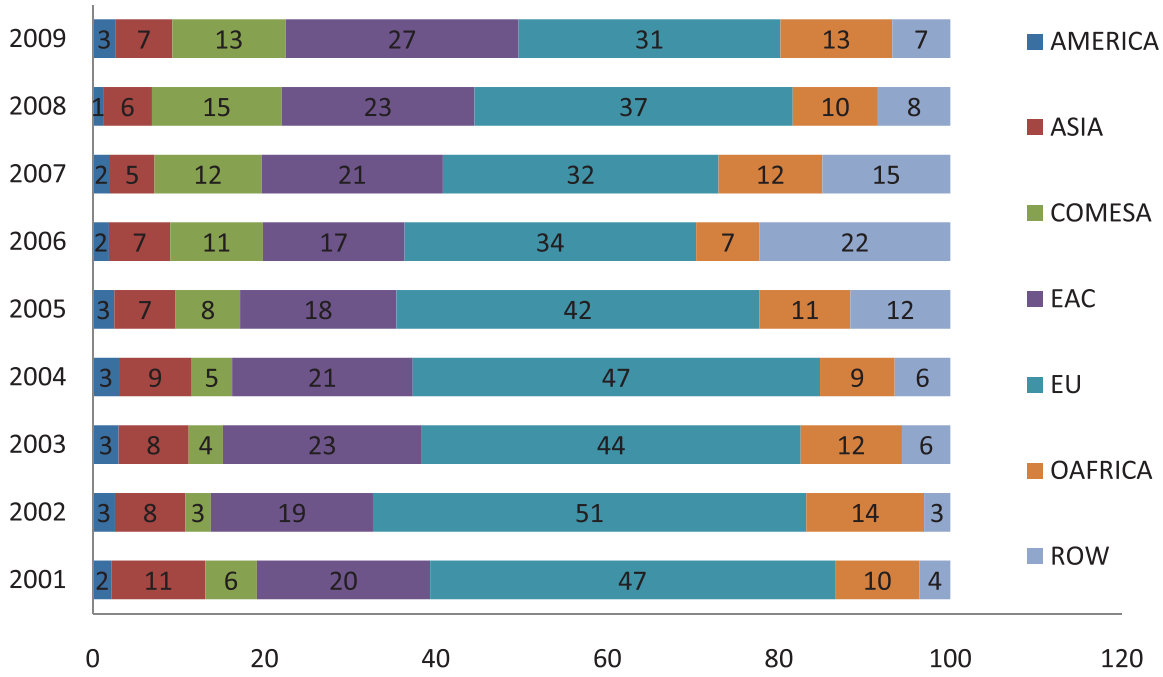
The rest of the paper is organised as follows: The next section provides a brief of the trends and patterns of Uganda's trade flows with different trading blocs. Section 3 provides a critical review of the relevant literature regarding determinants of trade flows. The analytical framework and methods is the subject of Section 4. Section 5 focuses on descriptive analyses prior to the presentation and discussion of the gravity model results in Section 6. The conclusions and emerging policy issues are discussed in Section 7.

3 The data are sourced from the Uganda Bureau of Statistics Abstracts. The foregone revenue from the EAC partner states is part of the 11 percent.

2. UGANDA'S TRADE FLOWS WITH THE DIFFERENT TRADING BLOCS[4]

Since the implementation of the EAC integration in 2001, Uganda has in general registered an increase in the value of total exports to all the trading partners within the EAC bloc as demonstrated in Figure 1 from about 20 percent in 2001 to 27 percent in 2009. However, other trading blocs like the European Union (EU) still play a significant role with regards to Uganda's exports and account for over 30 percent of total export trade.

Figure 1: The proportions of Uganda's exports to the different trading blocks, 2001-2009 (%)



Source of data: COMTRADE, 2012

It is noted that the EU as a key destination of Uganda's exports registered a decline in exports from 51 percent in 2002 to about 31 percent in 2009. On the other hand, exports, worth US$194.5 million were destined for the Common Market for Eastern and Southern Africa (COMESA)[5]in 2009, whose imports contribution have grown from 6 percent in 2001 to 13 percent in 2009. From a regional perspective, Uganda's exports to EAC and COMESA combined have grown from 26 percent in 2000 to 58 percent in 2009 underlining the increasing role of regional export trade. Likewise, it suggests an increasing role of the COMESA and the EAC in Uganda's export trade pattern (for details see Table A 1).

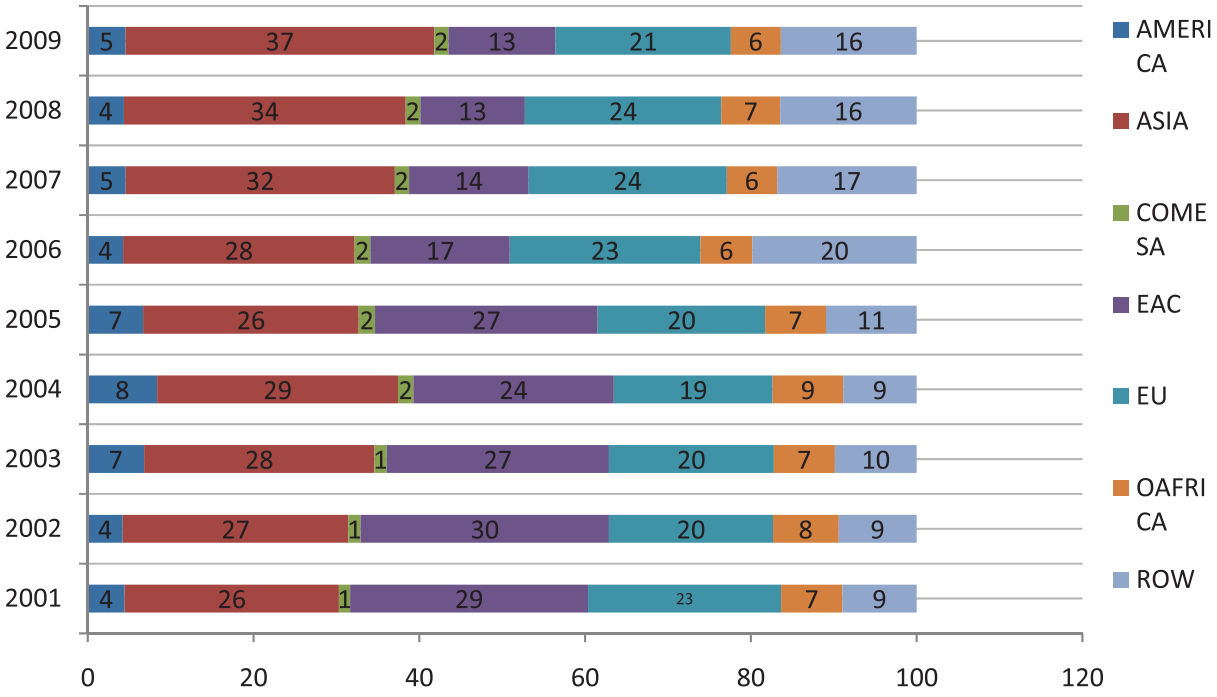
The proportion of Uganda's imports from the EAC region declined significantly from 29 percent in 2000 to 13 percent in 2009 as demonstrated in Figure 2. Apparently this decline was mainly

4 Details on import and export value are presented in Table A 1 and Table A 2.

5 The COMESA in this analysis excludes the EAC countries (Kenya, Burundi and Rwanda) for the sake of analyzing EAC trade flows. In reality COMESA Membership accounts for the largest proportion of Uganda's exports

experienced in 2006 and the years thereafter, following the implementation of the CU. In value terms, Uganda's imports from the EAC partner states increased from US$288million in 2001 to US$547million in 2009. This suggests that although the value of imports from the EAC partner states doubled, the proportion to total imports declined implying that Uganda is increasingly depending on other trading blocs for the country's imports. COMESA without the EAC partner countries contributes a small proportion that has increased from 2 percent in 2001 to 3 percent in 2009. During the same period, the EU maintained a constant proportion of exports to Uganda with an average of about 21 percent of the total imports for the country. This suggests that the implementation of the EAC treaty has so far not reduced Uganda's imports from the EU (for details see Table A 2).

Figure 2: The proportions of Uganda's imports from the different trading blocs 2001-2009 (%)



Source of data: COMTRADE

Uganda has experienced a tremendous growth in imports from Asia, from 26 percent of total imports in 2001 to about 37 percent of total imports in 2009 and Asia is likely to remain a dominant exporter to Uganda for the foreseeable future since the EAC region does not produce the type of goods currently imported from Asia. In monetary terms, imports from Asia have increased from US$259million in 2001 to US$1.576 billion in 2009. This reveals the increasing role the Asian region plays on the Ugandan economy. The statistics suggest that the decline in the proportion of regional imports is explained by the increasing imports from Asia. It is demonstrated in Figure 2 that the EU a major source of imports largely maintained its regional proportion. The increase in imports especially from Asia and Europe is primarily explained by the growth in private sector imports of capital and consumer goods such as petroleum

products, iron and steel, mineral fuels, electrical machinery, pharmaceutical products and sugar. The analysis to shed more light on the composition of exports is in Section 4.5. The increase in the import bill of petroleum products is attributed to the increase in the local demand for oil arising from shortage of hydro power and rising international oil prices. The analysis to shed more light on the composition of imports is in Section 4. Overall, most of the imports in Uganda originated from the Asian region and the EU, while the EAC experienced a decline proportionally. What emerges from this analysis is that although in absolute value, Uganda has increased imports from the EAC region (specifically Kenya), in terms of proportion, there has been a notable decline in favour of Asia in particular.

3. REVIEW OF RELATED LITERATURE

The recent proliferation of Regional Trade Agreements (RTAs) among countries characterised by overlapping tendencies known as the 'spaghetti bowl' has generated debate on the future of the stalled multilateral process given the growing regionalism. RTAs have spread and deepened across both the North and South. Yeats (1997) raised empirical questions whether RTAs stimulate growth and investment, facilitate technology transfer, shift comparative advantage towards high value activities, induce political stability or divert trade in inefficient channels and undermine the multilateral trading system. Trade theories explain the sources and possible scenarios that underpin this proliferation.

Trade theories that explain gains from integration are as old as when trade shifted from autarky to international trade. The theories explain why countries seek to integrate: The classical trade theory put forward by Richardo argues that trade raises a country's potential income (welfare) compared to autarky through specialization according to comparative advantage. Countries thus shift resources to production of goods where they efficiently produce and import goods where they are less efficient. However, the existence of tariff and non-tariff barriers distorts the final consumer price. Although the model explains the source of comparative advantage which motivates countries to trade; it assumes that labour is the only factor of production which is not true. It assumes perfect competition and yet imperfection exists, and many countries are small and are price takers. Furthermore, the assumption that transport costs do not exist is unrealistic.

The Heckscher-Ohlin (H-O) model on the other hand, explains international trade based on the country's factor endowments, that is, the relative quantities of capital and labour available for production. It assumes that countries have access to the same technology. In this way, countries with relatively large quantities of labour will shift production to labour-intensive production and export these goods and import capital-intensive goods. This implies that developed countries that are capital intensive will always dominate developing countries that are likely to be labour intensive. This perhaps explains why South-South RTA dominated by production of labour intensive goods and importing capital intensive products are likely to stall intra-trade. The model assumes that factors of production are only mobile within a country and immobile outside the country, implying that it is even more difficult for labour intensive countries to access capital intensive technology. Raul Prebisch and Hans Singer[6] explained the disadvantage of countries being segmented into exports of either manufacturers or primary commodities. Accordingly, countries exporting primary commodities will suffer terms of trade decline driven by low income and price elasticities of demand.

6 http://en.wikipedia.org/wiki/Singer%E2%80%93Prebisch_thesis

Other theories that incorporate market imperfections and explain the role of economies of scale in trade have been proposed. DeRosa (1998) extensively reviewed regional integration literature spanning the modern static theory and the extensions. For small countries the author argues that intra-regional trade will increase among member countries as long as they are predominantly least-cost producers of export goods. However, in cases where diversion will increase costs, non-member countries are likely to continue supplying imports to member countries which will negatively impact intra-trade. The following examples shed light on the empirical evidence over time.

Frankel *et al.* (1995) establish that intra-regional trade as a share of total trade among the Andean countries[7] increased between 1965 and 1990 from 0.8 percent to 2.6 percent. There is a higher performance among the East Asian countries from 20 percent to 29 percent during the same period. The intra-EC trade as a share of total EC exports increased from 35 percent in 1960 to 49 percent in 1970 (DeRosa, 1998). After the expansion of the EC from 6 to 9 countries[8] from 1970 to 1981, intra- EC trade as a share of total trade grew from 49 percent to 52 percent. The EC12 saw even more intra-trade. The decomposition the effects using a gravity model reveal a highly statistically significant relationship between regional integration and growth in intra-regional trade. A number of other studies have demonstrated an increase in intra-regional trade among integrating countries (for example, Vollrath, 1998 for Association of Southeast Asia Nations (ASEAN) Free Trade Area (AFTA), Asia-Pacific Economic Cooperation (APEC), Canada-United States Free Trade Agreement (CUSTA) and the European Union (EU). Sherman and Karen (1999) observe that much of the increases in trade occurred among developed countries, with developing and developed countries experiencing limited trade and developing countries experiencing even less intra-regional trade.

Other studies have painted a rather pessimistic picture of RTAs especially in developing countries (South-South). It is argued that the similarity of resource endowment of the partner members and the frequent failure by these countries to implement fully the terms of their regional integration agreement makes it hard for them to increase intra-regional trade. In some cases there has been deliberate undermining of the integration agreements. Naya and Plumber (1991) reported that the ASEAN after a decade of existence failed to increase intra-bloc trade much above its level of 15 percent to 20 percent of total ASEAN trade. In Latin America, the expansion of intra-regional trade in manufactures and all goods failed to match that in the EC and out-ward oriented East Asian Newly Industrialized Countries (NICs) of Korea, Hong Kong, Singapore and Taiwan. Nogues and Quintanilla (1993) report that the intra-regional trade in manufactures during 1965 to 1990 by the out-ward-oriented Asian NICs grew from 2 percent of GDP to 6.9 percent of GDP and the intra-regional trade in manufactures

7 The Andean Community of Nations is a trade bloc comprising the South American countries of Bolivia, Colombia, Ecuador and Peru
8 The countries that joined include Denmark, Portugal and United Kingdoms

during the same period by the ANDEAN[9] Pact countries grew from 0.1 percent of GDP to 0.6 percent of GDP.

A World Bank study on regionalism argues that South–South RTAs are non-edifying (World Bank 2001). Rather than reaping economic benefits like increase in intra-trade, they generate trade diversion which reduces welfare in circumstances when tariffs are high. Yeats (1998) looking at trade data from Sub-Saharan Africa argues that intra-regional trade has a potential to create adverse effects especially on third party member countries and concludes that intra-trade is likely not to make an important impact on the partner countries and may negatively impact Africa's industrialization. A most radical view about RTAs in the South was put forward by Schiff (1997). He argues that RTAs between small countries increase the likelihood of partners switching from cheaper imports from low cost third party members to higher cost partner members. Perhaps Park (1995) argument like Derosa (1998) reveals the source of this problem. The authors argue that when the intra-regional trade shares are small in total trade, there are more chances of trading blocs diverting trade.

A number of studies assessing the impact of trade liberalisation on Uganda have been done, although they do not specifically examine intra-regional trade. DeRosa *et al.* (2002) demonstrates the implications of the New EAC CU on Uganda's trade, industrial competitiveness and economic welfare. Mbabazi (2002) uses a CGE model to examine tariff liberalisation on the welfare of Uganda and reveals that exports increase and thereafter decline while imports increase with an overall increase in the negative trade balance. Bauer and Mugisha (2001) use a CGE model to analyse the impact of the reduction of both import and export tariffs on the Uganda Economy and highlight the worsening of the trade balance due to imports increasing at a higher rate than exports. Sangeeta *et.al* (2009) and Othieno and Shinyekwa (2011) assess the impact of Internal tariff reduction on trade, revenue and welfare of Uganda. It is revealed that there is more trade creation than diversion[10], hence a positive trade effect. These studies do not specifically examine Uganda's intra-EAC trade. Buigut (2012) estimates the trade effects of the EAC CU on individual member countries. This study is revealing, however, it does not cover the impact of other trading regions on Uganda which this paper contributes to. This present paper focuses on Uganda.

9 Comprised of Bolivia, Chile, Colombia, Peru and Venezuela - Chile left the pact in 1976.

10 Trade diversion occurs when a free trade area (in this case the EAC CU) diverts trade, away from a more efficient supplier outside the EAC region, towards a less efficient supplier within the FTA, for example Kenya, Tanzania, Burundi and Rwanda. This is likely to reduce Uganda's national welfare, however in some instances the national welfare may improve despite the trade diversion. Trade creation occurs when a free trade area (in this case the EAC CU) creates trade that would not have existed otherwise without the formation of the FTA. In this case as a result, supply will come from a more efficient producer of the concerned product. Gains occur if higher-cost domestic production is replaced by cheaper imports from one/all EAC partner states. Unlike trade diversion, in all cases trade creation raises a country's national welfare.

4. ANALYTICAL FRAMEWORK AND METHODS

4.1 Theoretical foundations of the gravity equation

The paper uses the gravity model to estimate the determinants of Uganda exports and imports. The application of the gravity model to assess and analyse international trade flows was first applied in the 1960s by Tinbergen (1962) and Poyhonen (1963). Since then, gravity models have been widely used in various economic disciplines to assess and forecast the impact of distance on the intensity of economic relations. In the latter half of the twentieth century, gravity models (details in section 4.2) were used to explain migration and other social flows in term of gravitational forces of human interaction (Eita, 2007). Initially, the theoretical foundations of applying gravity models to economic interchange and trade was heavily criticised as lacking basis and foundation from trade theory although the models exhibited high statistical explanatory power (Matyas *et al.,* 2000). The model was criticized for lacking the ingredients of the prominent models of international trade that included the Ricardian model, (differences in technology) and the Heckscher-Ohlin (H-O) model (differences in factor endowments) as the basis for trade (UNCTAD, 2012). This view does not hold anymore given the advancement made in the empirical work and literature.

Anderson (1979) made the first attempt to give a theoretical basis for gravity models. This was done in the context of a model where goods are differentiated by country of origin commonly known as the Armington assumption. Accordingly, consumers in a country with a given price/s will consume at least some of every good from every country owing to the existence of imperfect substitutability among goods. Given that all commodities are traded and all countries trade, in equilibrium, national income is made of both home and foreign demand for the unique good that each country produces. As such, larger countries export and import more and trade costs that include transport and others reduce trade flows.

Furthermore, Bergstrand (1985, 1989) argue that the gravity model is embedded in a monopolistic competition developed by Krugman (1980). The model has identical countries that trade in differentiated goods because consumers have a preference for variety thus overcoming the undesirable feature of Armington models that differentiate goods by location of production. Deardorff (1995, 1998) further demonstrates consistency of the gravity model with a wide range of trade models including the Heckscher-Ohlin-model, either with frictionless or with impeded trade. Furthermore, Eaton and Kortum (2002) derive a gravity-type equation from a Ricardian type of model, and Helpman *et al*., (2008). Finally, Chaney (2008) resorts to a theoretical model of international trade in differentiated goods with firm heterogeneity.

In the literature, the gravity models have been used to analyse bilateral trade and in all cases,

the authors argue that it is not difficult to justify even the simplest forms of gravity equations from standard trade theories. This underlines the fact that gravity models demonstrate a strong relation between bilateral trade flows and their determinants. Matyas *et al.*, (2000) modelling the export activity of eleven Asia-Pacific Economic Cooperation (APEC) countries established that the various members' propensities to import and export are sufficiently high. Laaser and Schrader (2006) analysing Baltic trade flows revealed that Estonia, Lativia and Lithuania have rapidly integrated into the international division of labour especially with the EU. Eita (2007) estimated the determinants of Namibian exports and concluded that increases in the importer's GDP and Namibia's GDP led to an increase in the country's exports. It was demonstrated that sharing a common border increases exports. To the contrary, increase in distance and importers' per capita income are associated with decrease in exports. Zarzozo and Lehmann (2003) applied the gravity trade model to assess Mercosur-EU trade and trade potential following the agreements reached between the two trade blocs. It was established that importer and exporter incomes are positively associated with bilateral trade flows. Whereas, the exporter population has a negative impact on trade flows, importer population has a large positive effect on exports. Other variables like infrastructure, exchange rates are important determinants of bilateral trade flows.

4.2 Gravitational model

The standard gravity model explains bilateral trade flows (imports and exports) as a function of the trading partners' market sizes and their bilateral barriers to trade. In its general form, trade flows between countries are explained by their economic size (GDP), population, geographical distance and a set of dummies. The model specification follows conventional paths widely used in the literature (see for example, Tinbergen 1962; Poyhonen 1963; Eita 2007; and UNCTAD 2012). The general specification of the gravity model is expressed in equation (1).

$$\ln(T_{ij})_t = \beta_0 + \beta_1 \ln(Y_{ij})_t + \beta_2 \ln(P_{ij})_t + \beta_3 \ln(D_{ij}) + \beta_k \ln(DUM_{ij}) + \varepsilon_{ijt} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

The dependent variables $ln(T_{ij})_t$ are trade flows, which are either imports $ln(M_{ij})_t$ or exports $ln(X_{ij})_t$ of Uganda (with subscript *i* indicating Uganda, *j* the trading partners and *t* time). $Ln(Y_{ij})_t$ is the GDP per capita income of Uganda and the trading partners, $ln(P_{ij})_t$ are the populations of Uganda and the trading partners, respectively. $ln(D_{ij})$, measures the distance between the two capitals of Uganda and the trading partners, $ln(DUM_{ij})$ is a set of dummies that assume value of one and zero, and ε_{ijt} is the error term.

In the empirical literature (for example, in Zarzoso and Lehmann 2003) a number of variables are used to capture trade barriers that include: transport costs captured by distance between countries; countries being islands, landlocked and border dummies to reflect that transport costs increase with distance. It is anticipated that transport costs are higher for landlocked

countries and islands, and are lower for neighbouring countries. According to Nordås and Piermartini (2004), information costs are generally captured by a dummy for common language between the trading partners. Therefore the value taken on is equal to one if the trading partner is an island, landlocked, borders Uganda, has a common language with Uganda respectively, and zero otherwise.

A study by Bougheas *et al.,* (1999) shows the limitation of the traditional gravity model which uses distance to model transport costs. It is argued that transport costs are not only a function of distance but also private and public infrastructure. They thus augment the model through introduction of infrastructure variables. They predict a positive relationship between the level of infrastructure and the volume of trade. This paper adopts infrastructure for Uganda and the partner country by computing a set of indices[11]. In the model, infrastructure is treated as $\ln(INFR_{ij})_t$ for Uganda and trading partner.

Foreign currency reserves are important indicators of ability to repay foreign debt and for currency defence, and are used to determine credit ratings of nations. In this context foreign reserves are a measure of the ability to import and therefore have a positive relationship with trade flows. In the model, they are represented by $In(FCR_{ij})_t$ for Uganda and trading partners. $In(RER_{ij})_t$ denotes the real exchange rate between Uganda and trading partners calculated as the average of the national currency unit of country *j* per US dollar divided by the annual average of the national currency unit of *i* per US dollar.

Finally, we add the dummy variables for the different trading blocs that Uganda trades with and these include: the EAC, Asia, EU and COMESA. Since membership overlaps for Kenya, Rwanda and Burundi, these were treated as primarily EAC countries and not COMESA countries. These dummies explain the significance of Uganda's trade with either of the trading blocs. With these addition variables, the equation (1) is re-expressed as in equation (2).

$$\ln(T_{ijt}) = \beta_0 + \beta_1 \ln(Y_{ij})_t + \beta_2 \ln(P_{ij})_t + \beta_3 \ln(D_{ij}) + \beta_4 (INFR_{ij})_t + \beta_5 (Lang_{ij}) + \beta_6 (Border_{ij}) + \beta_7 (Locked_j) + \beta_8 (Island_{ij}) + \beta_9 (InFCR_{ij})_t + \beta_{10} (InRER_{ij})_t + \beta_{11} EAC_{ij} + \beta_{12} ASIA_{ij} + \beta_{13} EU_{ij} + \beta_{14} COMESA_{ij} + \varepsilon_{ijt} \ldots\ldots\ldots\ldots\ldots 2$$

EAC_{ij}	*DV, = 1, if trade flow between Uganda and EAC partner states , = 0, if not*
$ASIA_{ij}$	*DV, = 1, if trade flow between Uganda and ASIA states , = 0, if not*
EU_{ij}	*DV, = 1, if trade flow between Uganda and EU states , = 0, if not*
$COMESA_{ij}$	*DV, = 1, if trade flow between Uganda and COMESA states , = 0, if not; and The rest of the variables are as described before.*

11 Infrastructure in each country is measured by an index constructed by taking the mean over four variables (Km of roads and railway density per 100 Km squares) and phone tele-density and internet users per 100 people. Details regarding modelling infrastructure on gravity models can be referred to (Nordås and Piermartini 2004)

4.2.1 The estimation procedure

The paper estimates three models using panel data for the period 2001-2009. A very important property in the panel data estimation is the individual effects which are treated either as fixed or random depending on conditions pertaining. Practically, Random Effects (RE) is appropriate for estimating trade flows between randomly drawn samples of trading partners from a large population. Fixed Effects (FE) is most appropriate for estimating trade flows between *ex ante* predetermined selection of countries (Eita, 2007). However, the FE model is plagued by the limitation that variables that do not change over time cannot be estimated directly because the inherent transformation wipes out such variables. FE models are used whenever the analyst is interested in estimating the impact of variables that vary over time. This is because FE will not work well with data for which within-cluster variation is minimal or for slow changing variables over time and at the extreme non-varying variables.

We use the Hausman test to choose between the FE and RE models. The choice is made by running the Hausman test where the null hypothesis is that the preferred model is RE versus the alternative - the FE model. It tests whether the unique errors (u_i) are correlated with the repressors. Since the *P-value* is *0.3665,* we accept the null hypothesis that the preferred model is the RE. Since the RE model had the correct specification for the trade flows, we conducted the Breusch-Peagan Langrange Multiplier (LM) to decide between a RE regression and a simple OLS regression. The null hypothesis says that the variances across entities are zero implying that there is no significant difference across units, that is, no panel effect in which case OLS suffices. The results show a very significant difference (*P-value 0.0000*) in which case we reject the null hypothesis and conclude that RE is the appropriate model to estimate. There is a strong evidence of the significant difference across the countries and therefore we cannot run a simple ordinary least squares (OLS).

Trade patterns between Uganda and the country's trading partners at one time is a function of trade in the past for various reasons, such as bilateral agreements and trade preferences that are likely to have a lag hence the need to apply dynamic models. Dynamic panel models are increasingly being used in panel data estimation partly due to increase in panel data availability and the vast array of economic theories fronting some form of partial adjustment of economic variables to an equilibrium level (Harris and Matyas, 1996). These are models which include lagged value(s) of the endogenous variable as explanatory variables. This paper therefore estimates a dynamic RE model in addition to the static RE to gauge the impact of previous trade flows on current trade flows.

It is argued that while FE models suffer short time series component, RE are often biased due to the correlation between the equation's disturbance terms and the lagged dependent variable (Sevestre and Trognon 1985). Harris and Matyas (1996) suggest that consistent estimators

for both specifications do exist and generally take the form of instrumental variables (IV). It is argued that IV estimation involves making use of certain orthogonality properties, that the instruments are asymptotically uncorrelated with the equation's disturbance terms. The use of such a wide set of orthogonality properties has propelled estimation to the more general area of Generalised Methods of Moments (GMM) estimation.

4.2.2 Diagnostic tests

We checked multi-collinearity in the model by conducting the simple correlation test that reveals the coefficients between the explanatory variables. It is demonstrated that the values of the correlation coefficients between explanatory variables are lower than 0.80. Following Studenmund (2001[12]) who argues that below such a threshold the model is fine, we concluded that there is no serious problem.

Unit root tests are conducted to determine a potentially co-integrated relationship between the variables. Whereas if all the variables are stationary, the traditional estimation methods can be used to estimate the relationship between the variables, if the variables are non-stationary, a test for co-integration is required. We conducted the Levin *et al.,* (2000)[13] test of panel unit roots that assume that the autoregressive parameters are common across countries. Levin, Lin and Chu used a null hypothesis of a unit root that states that the panels contain unit roots and the alternative that the panels are stationary. The test results indicate that all variables are stationary (the null unit root is rejected). As a result of this the co-integration test is not required to estimate the model.

4.3 The data

The data used in this paper were drawn from different sources and compiled to suit the analysis. The trade flow data were extracted from the COMTRADE and World Integrated Trade Solutions (WITS) databases. In this respect, 174 countries that trade with Uganda were included and further categorised into the trading blocs/regions of EAC, COMESA, EU, America, Asia and the rest of the world. The data for distances were extracted from the distance calculator website[14]. The distance is defined as direct distance from Kampala to the capital city of the trading partner without taking into consideration the actual routes by either forms of transport(*"as the crow flies")*. The per capita, real exchange rate, infrastructure (rail, road, mobile telephone phone tele-density, and internet connectivity) and population data for Uganda and the trade partner states were taken from the World Bank Development Indicators. The data on whether, a country is land-locked or not, is an island or not, borders

12 Studenmund AH (2001) Using Econometrics – A Practical Guide, San Francisco, CA, Addision Wesley Longman

13 Levin, A, Lin, C F and Chu (20020 Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties, Journal of Econometrics , 108. 1-1-24

14 http://www.timeanddate.com/worldclock/distanceresult.html?p1=115&p2=17

Uganda or not and has the same official language or not were extracted from the Centre d'Etudes Prospectivesetd' Informations Internationales (CEPII)[15] gravity dataset. The trading blocs and regions are constructed from existing information on Regional Trade Areas from the World Trade Organization. The analysis is done for the period 2001 to 2009, the period during the implementation of the EAC regional integration FTA and CU.

15 CEPII make available a "square" gravity dataset for all world pairs of countries, for the period 1948 to 2006. This dataset was generated by Keith Head, Thierry Mayer and John Ries to be used in the following paper: HEAD, K., T. MAYER AND J. RIES(2010)

5. DESCRIPTIVE ANALYSIS

In this section, we focus on descriptive analysis prior to the discussion of the gravity model estimates. There are a number of trade indicators which can provide information on the level of and changes in regional trade pattern or direction of trade flows. The trade indicators help explain which economies are the most important export destinations of a country, measure the geographical concentration or diversification of a country's export profile among others. A number of trade indicators can be computed, however this paper outlines three which complement the gravity model estimates namely: regional trade concentration versus dispersion index; trade intensity and complementarity indicators.

5.1 Regional trade concentration versus dispersion index

The emerging pattern of Uganda's trade during the 2000s gives evidence of the country's growing participation in the EAC. The quality of trade integration into different trading blocs can be measured by trade entropy indicators (Marwah 1995; Marwah and Klein, 1995) which give information on the spatial concentration of trade relations. This is based on the notion that a country which is trading with many other countries can be considered to be more deeply integrated into other trading blocs than a country trading with only a few partner countries (Schrader and Laaser, 2006). In numerical terms of a trade concentration indicator, trade with many countries means relatively low and equally distributed shares of trading partners' exports or imports in a country's aggregate trade figures. On the other hand, trading with few countries means unevenly distributed shares. In that respect, while some shares will be very high, others will be equal to zero. Whereas a low concentration record for a trading bloc implies that Uganda is less integrated into it, a high concentration record means that the country is more integrated into the respective trading bloc. Trade concentration is specified as follows for imports shares a_{ij}, of trading partner's j of country i and exports shares b_{ij}, respectively. This is expressed in equations (3) and (4) respectively. These equations are used to measure the degree of dispersion of the statistical distribution of all the import and export shares.

$$Im_i = a_{ij} In\left(\frac{1}{a_{ij}}\right) \quad with \quad 0 < a_{ij} \; and \; a_{ij} = 1 \qquad 0<a_{ij}=1 \tag{3}$$

$$Ix_i = b_{ij} In\left(\frac{1}{b_{ij}}\right) \quad with \quad 0 < b_{ij} \; and \; b_{ij} = 1 \tag{4}$$

The geographical trade dispersion of Uganda's trade during the implementation of the EAC compared to the other trading blocs/regions reveal that the country is getting more integrated into the region with regards to exports and less with regard to imports. Table 1 illustrates the trends in the geographical trade dispersion indicators for imports and exports. For imports, the trend reveals that Uganda is more integrated into Asia, the EAC and EU than COMESA, the

America and other African countries. On average the indices over the years are similar for Asia the EAC. On the other hand, exports reveal more integration into the EAC, COMESA and the EU than the other trading blocs/regions. It is noted that whereas the indices slowly decrease over the years for the EU, they increase for the EAC and COMESA further emphasising the growing integration of Uganda's exports in the EAC region.

Table 1: Trade integration of Uganda into the different trade blocs - Trade Entropy Indicators

Bloc	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
					Imports					
AMERICA	0.16	0.14	0.14	0.18	0.19	0.15	0.13	0.14	0.14	0.21
ASIA	0.34	0.35	0.35	0.36	0.36	0.35	0.36	0.37	0.37	0.28
COMESA	0.07	0.06	0.06	0.06	0.08	0.08	0.08	0.07	0.07	0.05
EAC	0.36	0.36	0.36	0.35	0.34	0.36	0.30	0.29	0.26	0.37
EU	0.32	0.32	0.30	0.31	0.31	0.31	0.31	0.33	0.32	0.29
OTHER AFRICA	0.19	0.19	0.20	0.19	0.21	0.19	0.17	0.17	0.19	0.24
ROW	0.24	0.26	0.26	0.24	0.25	0.27	0.34	0.31	0.32	0.22
Total	1.68	1.68	1.67	1.70	1.73	1.71	1.69	1.67	1.66	1.65
					Exports					
AMERICA	0.09	0.07	0.04	0.10	0.11	0.09	0.07	0.08	0.05	0.08
ASIA	0.21	0.23	0.22	0.19	0.21	0.19	0.16	0.15	0.16	0.17
COMESA	0.13	0.09	0.16	0.16	0.21	0.28	0.28	0.32	0.33	0.33
EAC	0.30	0.31	0.31	0.33	0.34	0.31	0.30	0.33	0.33	0.34
EU	0.37	0.36	0.36	0.35	0.36	0.36	0.35	0.34	0.35	0.33
OTHER AFRICA	0.24	0.26	0.13	0.22	0.10	0.10	0.09	0.14	0.09	0.09
ROW	0.33	0.34	0.37	0.35	0.35	0.34	0.37	0.34	0.32	0.34
Total	1.67	1.66	1.58	1.71	1.67	1.68	1.62	1.70	1.65	1.68

Source: calculations based on COMTRADE data, 2012

5.2 Trade Intensity indexes

Trade intensity index (*T*) is a complementary method of measuring and analysing bilateral trade flows to the gravity model. It measures trade performance between two countries. It was pioneered by Brown (1949) and developed and popularized by Kojima (1964) and Drysdale and Garnaut (1982). Hill (1985) applied *T* to analyse and explain the pattern, composition and trends in Australia-Philippine trade over the two decades 1962-81. Hill noted that overall, the *T* increased substantially since the early 1960's, especially in the case of Philippine exports to Australia. Similarly, Bano (2002) employed the *T* to examine the strength of trade relations between New Zealand and its major trading partners (Australia and selected Asia-Pacific nations) for the period 1981-1999. He found that bilateral trade flows between New Zealand, Australia and other countries had become more intense indicating that trading relations were

strengthening but in some cases the bilateral trade flows between the two countries had decreased. Bhattacharya and Bhattacharyay (2007) equally applied *T* to measure the trade potential between China and India. The study reveals that India and China possess a significant bilateral trade potential, which remains untapped.

Unlike the gravity model, the index abstracts from the effects of the size of the exporting and importing countries, and focuses on variations in bilateral trade levels. According to Drysdale and Garnaut (1982), the *T* measures the share of one country's trade with another country (or region) as a proportion of its share of world trade. For the country's exports to the country, the index (*T*) is define as the share of exports to in its total exports (X_{ij}/xi) relative to the share of import in world imports, net of imports ()[16]. The Index is written as in equation (5).

$$T = \left(\frac{X_{ij}}{X_i}\right) \Big/ \left(\frac{M_j}{M_w - M_i}\right) \qquad (5)$$

Where: X_{ij} = The exports of country *i* to country j

X_i = Total exports of country *i*

M_j = Total imports of country *j*

M_w = The total world imports

M_i = The total imports of country *i*

X_{ij}/X_i = This is the proportion of exports sent to trading partner relative to what is exported in totality.

$\frac{M_j}{M_w - M_i}$ = It is the foreign country's total imports as a proportion of total world imports less the import of the domestic economy.

The *T* takes a value between 0 and+∞. Values greater than 1 indicate an 'intense' trade relationship. Countries which import at proportionally high levels from the same country to which they send most of their exports will have a high *T*. Conversely, a country with diverse markets that is not reliant on any one country for their imports will have a low *T*. The limitation with this index is that with trade shares, high or low intensity indices and changes over time may reflect numerous factors other than trade policy changes between or among trading partners (UN ESCAP 2012).

The overall trade intensity index for Uganda's bilateral trade with its partners presented in Table 2 for the period 2005-2010 suggests a considerable increase in the index.

16 Mj is subtracted from Mw given that a country cannot export to itself, thus the only share of world imports it can have is a share of all countries' imports other than its own.

Table 2: Trade Intensity between Uganda and its trading Partners

Country	RECS	2005	2006	2007	2008	2009	2010
Burundi	EAC/COMESA	1041.7	994.3	1394.5	1378.9	1221.0	1053.3
Rwanda	EAC/COMESA	1157.7	833.1	1460.6	1383.4	1224.5	1351.7
DR Congo	SADC/COMESA	466.0	185.4	352.2	288.2	382.4	384.9
Sudan	COMESA	102.4	159.1	231.5	280.4	201.5	244.1
Kenya	EAC/COMESA	166.0	151.3	138.2	156.4	143.6	153.4
Tanzania	EAC/COMESA	59.7	45.1	60.8	45.0	47.1	49.5
Eritrea	COMESA	8.9	19.2	1.6	7.1	4.8	3.6
Mauritius	SADC/COMESA	4.9	9.5	1.6	0.3	1.1	2.8
South Africa	SADC/SACU	2.3	2.0	1.5	1.7	3.0	1.2
Netherlands	EU	2.8	1.7	1.3	1.2	1.4	1.5
Belgium	EU	1.5	1.6	1.5	1.5	1.1	1.1
Malawi	COMESA/SADC	1.4	1.2	0.9	0.8	2.3	0.4
Ethiopia	COMESA	1.2	0.8	1.7	0.6	4.4	4.1
Spain	EU	0.8	0.7	0.7	0.6	0.8	1.1
Swaziland[1]	SACU/COMESA/SADC	31.7	0.7	2.5	36.6	20.5	0.8

Source: Own computation based on the WITS Data base, 2012

It is important to note that this result indicates a strong trade flow between Uganda and some of the regional trade partners especially Burundi, Rwanda, DRC, Sudan, Kenya, Tanzania, Eritrea, Mauritius, Malawi, Ethiopia and Swaziland. These are either EAC partners or COMESA member states. This implies that these countries proportionately import goods from Uganda to which they also send most of their exports, thus a high *trade intensity indicator*. Considerably, the analysis also shows high trade intensity with some EU member states such as Spain, Netherlands and Belgium.

5.3 Trade Complementarity Index (TCI)

The TCI measures the degree to which the export pattern of a given country matches the import pattern of another. TCI provides the framework under which the trade flow between two countries or groups of countries could be ascertained to be more or less compatible despite the low or high intensity between or among them. A high degree of complementarity is assumed to indicate more favourable prospects for a successful trade arrangement. It is possible, for example, for the composition of two countries' exports and imports to be similar. Accordingly, Drysdale (1982) notes that the index takes account of the commodity composition of the countries' trade, and one which reflects the intensity of trade in the commodities which are traded. The Index is specified in equation (6).

$$TCI = \left[1 - \left|\frac{\sum m_{dw} - \sum x_{ds}}{2}\right|\right] x100 \qquad (6)$$

Where, is the share of good ***d*** in global exports of country ***s*** and is the share of good ***d*** in all imports of country ***w***. The inner bracket in the index is the sum of the absolute value of the

difference between the sectoral import shares of one country and the sectoral export shares of the other. Dividing the summation results by two converts this to a number between 0 and 1, with zero indicating all shares matched and 1 indicating none. Subtracting from one reverses the sign, and multiplying by 100 puts the measure in percentage terms (UN ESCAP, 2012). The ***TCI*** results lie on the range 0-100, with 100 indicating perfect overlap (that is, export and import shares exactly match), whereas a zero would imply that no goods are exported by one country or imported by the other.

The results in Table 3 reveal relatively high level of complementarity of Uganda's exports with imports of its trade partners within the respective regional blocs of EAC, COMESA, SACU, SADC, EU, ASEAN and USA. This suggests that Uganda's trade profile is becoming more compatible with these trade blocs, notably SACU, EAC, SADC, COMESA and ASEAN. This corroborates with the results of the trade intensity analysis discussed earlier. This result could be explained by the nature of products that Uganda exports to the respective blocs and what these blocs import or produces locally. Uganda largely exports commodities/raw materials which do not, to a great extend, complement the imports of EU-27 or USA from other trade partners.

Table 3: Trade Complementarity between Uganda and its trading partners

	SADC	EAC	COMESA	SACU	EU-27	USA	ASEAN
2005	44.8	42.1	41.5	57.6	34.9	32.9	39.9
2006	41.6	40.3	42.3	47.0	32.0	26.7	35.0
2007	37.1	39.3	35.9	45.6	30.8	30.5	33.6
2008	36.8	36.8	34.3	47.7	28.4	25.7	30.6
2009	39.8	45.5	39.3	45.4	30.6	26.5	33.6
2010	38.9	39.6	38.5	45.7	29.7	25.1	32.6

Source: Own computation based on the WITS Data base, 2012

5.4 The share of Uganda's trade flows in different markets

Table A 3 - Table A 5 identify leading importers of Uganda's products and the share of the country's respective commodities of imports in those markets, as well as the top three leading exporters of the given products in these markets. It is notable that in the year 2011, coffee, not roasted or decaffeinated formed the largest proportion of Uganda's originated exports to the world accounting for about 18 percent share of total exports of the top 36 products. Switzerland provided the largest market share for coffee exports accounting for about 4.2 percent of the total exports in 2011 unlike 2010 where it was 2.6 percent share. Likewise, coffee accounted for the greatest proportion of commodity exports from Uganda in 2010 accounting for about 13.3 percent of the top 33 major domestic exports in 2010.

In addition, Uganda's considerable coffee markets include Switzerland, Sudan, Germany,

United Kingdom, Spain and Singapore with market shares of about 5.5 percent, 4.9 percent, 3.1 percent, 2.7 percent and 2.2 percent respectively. Other considerable markets for Uganda's coffee include: Italy, Poland, Belgium, Netherlands and United States of America. However, among all the eleven markets, Uganda only features as a major player of coffee exports to Sudan and Poland. Products like roses, whether grafted or not, as well as un-rooted cuttings and slips are largely exported to the Netherlands taking a market share of 2.8 percent and 1.5 percent respectively. Netherlands provides the export market for more than 96 percent of the country's flower exports to the World. The leading exporters of roses in this market include Poland, South Africa and China; however, Uganda emerges among the top three leading exporters of un-rooted cuttings and slips with Kenya and China. Other major commodity exports across the years include black tea, Portland cement, tobacco, vegetable fats and oil, tubes and pipes and maize seed largely to the regional markets. Whereas, other commodities including, gold, carded cotton, cobalt, roses, cocoa beans and tobacco are exported to other markets such as the EU, South Africa, USA and United Arab Emirates.

It is equally observed that Uganda's gold in *other semi manufactured* form to the United Arab Emirates (UAE) worth US$ 111.6 million in 2009 accounted for about 15.6 percent of the market share. The UAE market alone accounts for 99.8 percent of Uganda's gold exports to the world. Likewise, Uganda ranks among the leading top three exporters of gold to UAE including Australia and Kazakhstan. The country's second major export commodity in 2009 was black tea (fermented or partly fermented) to Kenya with a market share of about 7 percent. Similarly, Kenya accounts for more than 99 percent of Uganda's black tea exports to the world. This implies that Kenya is the single importer of black tea from Uganda; however, this is attributed to the presence of the auction market at Mombasa being in Kenya. The key players in the black tea export to Kenya include: Uganda, Malawi, Tanzania and Mozambique. Another important export product for Uganda is carded or combed cotton. It is largely exported to Singapore with a market share of about 2 percent and the share of the country's total exports to the world in this market is 69.4 percent. The major players of cotton exports in the Singapore market are Taiwan, India and Malaysia. Other major product specific markets for Uganda's exports illustrated in Table A 3 - Table A 5 include: South Africa, Kenya, Democratic Republic of Congo, Rwanda and Sudan for products such as; tobacco, maize corn seed, flat rolled metallic bars, vegetable fats and oil, soap and beer made from malt. In essence Uganda exports are dominated by regional countries and a few countries in Europe, Middle East and Asia.

Table 6 in Appendix A1 identifies Uganda's share of exports to top thirty respective trading partners. It further illustrates the growth rate of Uganda's exports to those respective markets, as well as the share of the respective partner countries in world imports. In the first instance, the results in this table correlate well with that in the previous analysis. Uganda's

key major markets include, *inter alia*, Sudan[17] which accounts for 12.9 percent, Kenya (11.8 percent), DR Congo (11.4 percent), Rwanda (9.3 percent) and these countries constitute the EAC and COMESA trade blocs where Uganda is both a partner and a member respectively. Other considerable export markets for Uganda include: United Arab Emirates which account for about 7.5 percent of the country's share of export markets, Netherlands (5.6 percent), Germany (4.5 percent), Switzerland (3.6 percent) and Burundi (3.2 percent) among others.

The markets where Uganda registered more than a 20 percent growth rate penetration within the period 2006-2010 include Rwanda (44 percent), DR Congo (39 percent), China (28 percent), Italy (27 percent), Tanzania (24 percent), Burundi (23 percent), Kenya (20 percent) and Sudan (21 percent). This trend suggests that China in the East is the emerging potential market for Uganda's exports while it also reflects strong regional trade considering the proportion of the EAC partner states' growth rate. In addition, it further justifies the last column in Table 6 (Appendix A1) which illustrates China as among the top importers second to United States of America (USA) in the world with the greatest share of imports. Where USA accounts for 12.9 percent of world imports, China comes second with 9.2 percent share, hence a potential export market. Other countries with big export shares include Germany (7 percent), France (3.9 percent), United Kingdom (3.7 percent), Italy (3.2 percent), Hong Kong China (2.9 percent), and Netherlands (2.9 percent).

On the other hand, Table A 7 illustrates more importantly the trade partner's share in Uganda's imports and the import growth rate of the respective trade partners. The analysis shows that India is the leading exporter to Uganda with 14.7 percent market share. Other leading exporters include: Kenya (11 percent), China (8.9 percent), United Arab Emirates (8.4 percent), Japan (6.6 percent), South Africa (5.4 percent) and South Arabia (5.1 percent). This suggests that within the two regional trade blocs of EAC and COMESA where Uganda is both a partner and a member, Kenya is the only largest single exporter to Uganda. Tanzania and Egypt that emerged among the leading thirty (30) exporters to Uganda, only accounted for 1.2 percent and 1 percent respectively in the share of Uganda's imports. Asia presents the bigger share in Uganda's imports by more than 50 percent of total imports. This perhaps suggests that there is less trade within the current regional trade groupings in Eastern Africa. Table A 7 further shows trade partners whose share in Uganda's imports registered substantive growth within the period 2006 to 2010. Those that registered a growth rate of more than 20 percent include: Indonesia with 75 percent, Kuwait (62 percent), Saudi Arabia (54 percent), Republic of Korea (36 percent), India (32 percent), China (29 percent) and Netherlands (26 percent).

17 This includes South Sudan

6. GRAVITY MODEL ESTIMATION RESULTS

This section presents and discusses the estimation results. The ultimate purpose of this study is to compare the performance of Uganda's intra-EAC trade with that of the other trading blocs/regions. To this end, care is taken to examine the levels of significance and coefficients of the estimations representing the different blocs/regions, to make comparisons. In addition, pertinent variables are interpreted in respect of their impact on Uganda's overall trade - imports and exports. The results are based on the different estimations undertaken as discussed in section 4.2.1. The discussion is based on the static RE and dynamic RE. We omit the results of the IV GMM (details in Table A8 in the Appendix) in the discussion because they are similar to those of the dynamic RE.

6.1 Exports – the Static RE and Dynamic RE Models

The results for exports (Table 4) demonstrate that an increase in the importer's income (per capita GDP) have significant (<1 percent) relationship with Uganda's exports. Whereas increasing the importer's GDP by 10 percent will lead to a 3.9 percent increase in Uganda's exports (RE), it is 3.3 percent under the dynamic RE model. Similarly, the population of the importer has a significant impact on Uganda's export at less than one percent level for both the RE and dynamic RE. Increasing the importer's population by 10 percent leads to 7.7 percent in Uganda's exports (RE) and 6 percent under the dynamic RE model. The coefficients of the two variables are positive as anticipated and highly statistically significant which is consistent with the theoretical expectation of the gravity models. This suggests that an increase in the income and population of Uganda's trading partners leads to increase in the amount that Uganda exports. Since Uganda's export destination is dominated by the regional countries (neighbours), specifically, belonging to COMESA and the EAC, growth in their GDP and population is very important to the country's exports.

As expected the lagged exports added to the list of predictor variables is statistically significant (less than 1 percent), moreover with the expected positive sign and the coefficient is high. This suggests that lagged exports exert a positive and highly significant impact on current export flows. It is argued that trade relations to increase trade once cultivated are likely to respond with time suggesting that exports in the previous year impact on exports in the current year. In the context of the analysis, the different trade agreements signed by Uganda and the country's trading partners are taking effect. This implies that the growth of Uganda's exports to the country's trading partners is positive and is determined by previous exports.

Table 4: Results for the exports -2001-2009 (Random effect, Dynamic Random Effect)

Variable	RE	Dynamic RE
Constant	-191.2 (208.7)	-209.6 (240.2)
Exports lagged		0.504 (0.0233) ***
Distance	-0.365 (0.34)	-0.184 (0.14)
Importer's GDP	0.393 (0.114) ***	0.330 (0.0917) ***
Importer's population	0.774 (0.119) ***	0.604 (0.096) ***
Uganda's GDP	-3.406 (9.793)	-1.522 (10.92)
Uganda's population	11.48 (13.98)	11.93 (16.04)
Importer's infrastructure	-0.0364 (0.157)	-0.107 (0.14)
Uganda's infrastructure	-0.0107 (0.876)	-0.541 (0.98)
Importer's FCR	0.393 (0.142) **	0.142 (0.0992)
Real Exchange rate	-0.116 (0.743)	0.914 (0.907)
EAC	5.724 (2.588) *	3.026 (1.061) **
Asia	2.178 (1.063) *	0.765 (0.454)
COMESA	4.286 (1.117) ***	2.269 (0.477) ***
European Union	3.795 (0.803) ***	2.079 (0.37) ***
Border	4.944 (2.227) *	2.105 (0.922) *
Island	-1.265 (0.852)	-0.655 (0.325) *
Locked	-1.561 (0.776) *	-0.22 (0.362)
Language	2.615 (0.698) ***	0.997 (0.295) ***
R squared		
Overall	0.43	0.60
Between	0.60	0.91
Within	0.05	0.015

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Distance has a negative coefficient and this is consistent with *a priori* expectation. The distance to Uganda's export partners negatively impacts the amount exported although in the static RE model, it is insignificant. In the literature, distance is one of the factors that express multi-lateral resistance terms. Targeting regional countries to mitigate difficulties associated with distance is a reasonable policy option although this depends on the existing complementarity among the country's regional export trade partners. Uganda's infrastructure and that of the destinations for the country's exports is not significant in the model.

The level of the foreign currency reserves of Uganda's export trade partner has a significant impact on the country's exports. This suggests that foreign currency reserves difficulties in these countries reduce Uganda's exports. However, the real exchange rate is insignificant which is explained by the fact that Uganda being a small country exporting largely non-industrial products experiences the small country effect.

The variables of interest in the estimation with regard to the study objective are the dummy variables representing the different trade blocs/regions. Results reveal that the most important blocs are EAC, COMESA and EU with larger coefficients of 5.7, 4.3 and 3.8 respectively, and are

highly statistically significant. This suggests that an export trading partner belonging to the three main blocs increases Uganda's export trade flows. It is also noted that although Uganda is integrating the country's export trade in the EAC region, the EU and COMESA still play a very significant role. This suggests that Uganda's intra EAC exports although growing remains less in comparison to EU and COMESA combined. Even then, Uganda's exports to the EAC region are very significant. As exhibited in Figure 1, the share of exports to the EU has dramatically reduced from 47 percent in 2001 to 31 percent in 2009. Asia as a region is also significant (RE) but not as important as the other three regions. However, in the dynamic models, the Asian region although positively related has an insignificant relationships with Uganda's export flows. Overall, the results of the regional blocs/regions using the dynamic models do not significantly differ from the static RE as the EAC, COMESA and EU regions respectively maintain the highest impact on Uganda's export trade flows.

A set of contingent dummy variables were modelled to explain the impact of proximity, location and communication. The dummies of border, island, land locked and language have the expected signs, with high explanatory power and significance levels. Uganda is a landlocked country that experiences high costs of exporting goods. The model shows that bordering Uganda specifically, Kenya, Rwanda, Tanzania, Sudan and the Democratic Republic of Congo increases export trade. The coefficient is about 5 and positive and the variable is significant at 5 percent. The export destination being an Island decreases the amount of commodities exported from Uganda to the respective destination (except for the RE model). This is similar to an export destination being land locked (except for the dynamic RE model). Communication has been simplified by technology and it is argued that this has increased the volume of trade globally. The results suggest that having the same language (English) with the export partner increases Uganda's exports. The coefficients are positive, high and significant at less than 1 percent. The overall picture suggested by the dummies is that Uganda's exports are likely to; reduce with increasing distance to an export destination, increase with proximity to importers, reduce with poor linkages to markets and increase with ability to communicate to importers.

The empirical question is whether the EAC regional integration is bearing fruits of deepening trade. From the foregone discussion, it is evident that regional integration is helping to increase Uganda's intra-EAC regional trade. The reduction of internal tariffs, reduction of non-tariff barriers and adoption of a common external tariff is paying off (Othieno and Shinyekwa 2011; Shinyekwa and Mawejje 2013). The trade indicators previously discussed further demonstrates that particular commodities have specific destinations which explains the continued big impact of the other trading blocs on Uganda's aside the EAC.

6.2 Imports – the Static RE and Dynamic RE Models

Results in Table 5 suggest that an increase in the exporter's income and population leads to increase in Uganda's imports and the two demonstrate significant gravitational forces on Uganda's import flows consistent with theory. The coefficients of the two variables are positive as expected *a priori* and statistically significant. An increase in the exporter's GDP by 10 percent leads to 2.8 percent imports of the partner's goods (RE) and 2.2 percent (dynamic RE). On the other hand, when the exporter's population increases by 10 percent, Uganda's imports increase by 2.3 percent (RE) and 3.8 percent (dynamic RE).The lagged imports added to the list of predictor (RE dynamic) variables is statistically significant (less than 1 percent), with the expected positive signs and large coefficients. This suggests that lagged imports exert a positive and highly significant impact on current import flows. This is not surprising given that Uganda's imports are currently three times the value of exports evidenced by the persistent growing negative trade balance.

Distance has a negative coefficient and this is consistent with the a *priori* expectation. The distance to Uganda's partners impacts the amount imported negatively although in the static RE model it is insignificant. For the dynamic RE which is significant, a 10 percent increase in distance between Uganda and the partner reduces imports from Uganda's partners by 2.9 percent. It is evident that although the relationship is significant, it is inelastic owing to the nature of Uganda's imports – mainly manufactured and intermediate goods. Uganda mainly relies on Asia and Europe in addition to the EAC for such imports. The Middle East and Asia have become very significant in contributing to Uganda's imports. Uganda has experienced a tremendous increase in imports from Asia from 26 percent in 2005 to 37 percent in 2009. The increase in imports especially from Asia and Europe is primarily explained by the growth in private sector imports of capital and consumer goods such as petroleum products, iron and steel, mineral fuels, electrical machinery, pharmaceutical products and sugars.

Table 5: Results for the imports -2001-2009 (Random effect, Dynamic Random Effect)

Variable	RE	Dynamic RE
Constant	102.2 (-183.1)	186.5 (216.3)
Lagged imports		0.614 (0.0209) ***
Distance	-0.23 (0.348)	-0.288 (0.125) *
Exporter's GDP	0.282 (0.0964) **	0.220 (0.0642) ***
Exporter's Population	0.229 (0.0955)*	0.376 (0.063) ***
Uganda's GDP	5.101 (9.702)	5.639 (11)
Uganda's Population	-7.156 (12.29)	-12.47 (14.34)
Exporter's Infrastructure	0.633 (0.126) ***	0.515 (0.106) ***
Uganda's Infrastructure	0.443 (0.777)	0.544 (0.892)
Uganda's FCR	-0.282 (0.938)	-0.391 (1.332)
EAC dummy	5.981 (2.701) *	2.229 (0.962) *
Asia dummy	5.735 (0.965) ***	1.450 (0.379) ***
COMESA dummy	4.010 (1.151) ***	1.613 (0.419) ***
EU dummy	3.503 (0.807) ***	0.822 (0.317) **
Border dummy	2.45 (2.328)	0.639 (0.827)
Island dummy	-3.300 (0.857) ***	-0.724 (0.323) *
Locked dummy	-2.735 (0.758) ***	-0.53 (0.275)
Language dummy	1.880 (0.713) **	0.633 (-0.257) *
R squared		
Overall	0.382	0.673
Between	0.488	0.953
Within	0.0577	0.0217

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Although as Uganda's per capita GDP increases, imports increase, the coefficient is not statistically significant. Similarly, Uganda's population does not have a significant impact on the country's imports. Uganda's foreign currency reserves have insignificant coefficients in this model although they have the expected signs. The infrastructure in Uganda and the country of source for imports have positive impact on Uganda's imports. However, it is only the latter's infrastructure that is highly significant for Uganda's import. This suggests that Uganda imports from countries with well-developed infrastructure. Note that the bulk of Uganda's imports come from industrialised countries with developed infrastructure which suggests that Uganda's imports are a reflection of the country's low technology. Uganda's foreign currency reserves have a negative impact on the country's imports although it is insignificant.

The trading blocs/regions have positive signs as expected and have high significant levels. However, from a comparative perspective, the magnitudes significantly differ. Whereas the EAC is significant at 5 percent, the rest of the regions are significant at one and less than one percent. Furthermore, Asia has the largest coefficient among the remaining three. The results suggest that Asia remains the most dominant trading region with regard to imports and the EAC is the least dominant when it comes to Uganda's imports. Although Uganda has

considerably increased the volume and value of imports from the EAC partner states, owing to technological deficits in the EAC region, all the countries still heavily rely on the industrialised countries for high technology products. This suggests that Uganda's intra-EAC import trade although growing is proportionally less in comparison to Asia and EU.

The dummy variables (border, Island, land locked and language) to explain the impact of proximity; location and communication reveal consistent results to *a priori* expectation. Although the border dummy has a positive relationship with imports, it is insignificant, explaining the limited imports from Uganda's immediate neighbours in comparison to the other blocs. Bordering Uganda specifically, Kenya, Rwanda, Tanzania Sudan and the Democratic Republic of Congo has a positive but insignificant impact on Uganda's imports. Being an island and/or land locked reduces imports from the respective countries, with the former being significant. English as a language of communication also increases the amount of imports from the respective countries and is significant. Concerning language (English). results suggest that having the same language with the import partner increases Uganda's imports. The coefficients are positive and highly significant.

7. CONCLUSION AND EMERGING POLICY ISSUES

Gravity models were estimated to investigate and explain factors that determine Uganda's trade flows from/to the different trade blocs/regions. This was done to compare the impact of the different trade blocs/region on Uganda's trade flows. The testing of the intra-bloc trade effects demonstrated positive signs and statistically significant levels suggesting that belonging to either of them fosters trade. It is concluded that Uganda's import and export trade flows have conspicuously adjusted to the gravitational forces of the EAC during the progress of the integration. There is thus compelling evidence that Uganda's foreign trade flows are slowly getting integrated into the EAC region. Therefore, regional integration is helping to increase intra-regional trade. The reduction of internal tariffs, reduction of non-tariff barriers and adoption of a common external tariff is paying off.

Whereas comparing the intra-bloc/regional effects depicts export trade being integrated more in the EAC and COMESA regions than other trading blocs/regions, it is clear that Uganda's imports are more integrated in the Asian and EU blocs/region than the EAC. Strong links remain in the other blocs outside the EAC with reasonable variations between exports and imports arising from the nature of commodities. This is partly caused by technological deficits in the EAC region that make it heavily rely on the industrialised countries for high technology products while exporting primary products.

The trade indicators analysis of Uganda's trade flows corroborates the gravity model estimation results that during the implementation of the EAC CU, Uganda's export trade got more integrated into the EAC. The trade indicators also underpin the strong integration of Uganda's import trade into the Asian region and the EU bloc. The trade indicators further demonstrate that Uganda exports largely primary products and imports, manufactured products.

In light of these findings:(i) Uganda should target regional destinations for the country's exports in addition to other blocs; (ii) Regional trade agreements should adequately be implemented to promote intra-EAC trade; (iii) Given the composition of Uganda's exports and imports, to increase intra-EAC regional trade, Uganda, and other EAC partner states should attract and channel investment in production of high technology products. This can be done through deliberate government involvement and attraction of strategic foreign direct investment. Additionally, Uganda should actualise the education, skills, technology development strategies in the National Development Plan to increase the stock of skills; (iv) There is need for Uganda and the EAC region to improve infrastructure such as roads railways to reduce transport costs and improve on trade facilitation to boost trade. Revamping the railway system from Uganda to Mombasa targeting reduced unit transport costs is extremely crucial.

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APPENDIX

Table A 1: Uganda's Exports to the different trading blocs 2001- 2009 (millions USD)

Bloc	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
AMERICAs	9,483	11,784	14,934	18,970	19,867	17,381	26,032	20,140	39,345	177,936
ASIA	46,880	37,550	40,557	53,222	56,916	66,227	67,363	95,415	96,583	560,713
COMESA	25,944	13,502	19,785	29,404	59,611	99,960	162,205	253,292	194,511	858,214
EAC	87,147	86,418	115,143	131,854	144,770	152,830	274,818	377,437	398,792	1,769,209
EU	203,322	230,800	219,375	297,175	336,499	314,716	417,757	622,016	448,566	3,090,226
OAFRICA	42,405	62,713	58,556	54,562	83,885	68,667	157,194	166,919	191,570	886,471
ROW	15,454	13,918	27,996	40,563	92,613	205,825	193,767	141,344	99,303	830,783

Source: COMTRADE. Notes: AMERICA is the AMERICAS, OAFRICA is other African countries and ROW is the rest of the world

Table A 2: Uganda's Imports from the different trading blocs 2001- 2009

BIOC	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
America	44,806	45,250	93,446	144,279	137,179	109,287	159,865	197,772	192,586	1,124,470
Asia	259,705	292,491	382,083	499,558	534,222	713,439	1,133,985	1,537,664	1,576,815	6,929,962
COMESA	13,809	15,618	20,444	32,006	40,675	48,932	60,036	80,278	73,046	384,844
EAC	288,491	321,804	368,678	415,685	551,441	430,179	504,078	570,604	546,954	3,997,914
EU	234,097	212,285	273,275	329,741	414,968	587,514	835,151	1,072,882	894,547	4,854,460
OAFRICA	74,448	85,255	101,549	146,626	150,777	160,159	211,833	320,669	255,769	1,507,085
ROW	89,922	100,873	135,509	152,073	224,352	506,521	587,815	744,970	693,212	3,235,247

Source: COMTRADE. Notes: AMERICA is the AMERICAS, OAFRICA is other African countries and ROW is the rest of the world

Table A 3: Uganda's Leading Export Markets and 3 leading Competitors, 2011

HSCODE	DESCRIPTION	Us Dollar Value	PARTNER COUNTRY	Leading Exporters in these markets	(%)Total Export Share,
0901.11.00	Coffee, not roasted or decaffeinated	90,262,732	SWITZERLAND	Brazil, Colombia,Guatemala	4.2
0901.11.00	Coffee, not roasted or decaffeinated	74,897,465	GERMANY	Brazil, Viet Nam, Colombia	3.5
0901.11.00	Coffee, not roasted or decaffeinated	61,657,135	SUDAN	Uganda	2.9
2523.29.00	Portland cement (excl. white)	41,272,217	RWANDA	Uganda, Tanzania	1.9
0902.30.00	Black tea (fermented) and partly fermented tea in packings	36,121,820	KENYA	Uganda, Tanzania, Malawi	1.7
0901.11.00	Coffee, not roasted or decaffeinated	35,635,346	ITALY	Brazil, India, Viet Nam	1.7
5203.00.00	Cotton, carded or combed	34,548,029	SINGAPORE		1.6
0902.40.00	Black tea (fermented) and partly fermented tea, nes	33,752,676	KENYA	Uganda, Tanzania, Malawi	1.6
0901.11.00	Coffee, not roasted or decaffeinated	34,003,799	SPAIN	Brazil, Colombia, Germany	1.6
0901.11.00	Coffee, not roasted or decaffeinated	33,585,246	BELGIUM	Brazil, Colombia, France	1.6
1701.11.90	--- Other	28,919,788	SUDAN	Uganda	1.3
0304.19.00	Other	29,102,928	BELGIUM		1.3
2523.29.00	Portland cement (excl. white)	25,157,827	D.R.CONGO	Uganda, Tanzania	1.2
0602.10.00	Unrooted cuttings and slips	24,045,760	NETHERLANDS	Kenya, Uganda, Tanzania	1.1
0901.11.00	Coffee, not roasted or decaffeinated	23,855,545	SINGAPORE		1.1
1516.20.00	Vegetable fats and oils and their fractions, hydrogenated, et	23,254,582	RWANDA	Uganda, USA, Malaysia	1.1
2523.29.00	Portland cement (excl. white)	23,164,601	SUDAN	Uganda, Kenya	1.1
1511.90.30	--- Palm olein, RBD	21,144,842	RWANDA	Uganda, Kenya, DRC	1.0
5203.00.00	Cotton, carded or combed	20,986,579	UK		1.0
1701.99.90	-- Other	19,644,642	SUDAN		0.9

HSCODE	DESCRIPTION	Us Dollar Value	PARTNER COUNTRY	Leading Exporters in these markets	(%)Total Export Share,
0602.40.00	Roses	19,178,782	NETHERLANDS	Kenya, Uganda, Tanzania	0.9
2203.00.90	--- Other	17,668,090	SUDAN		0.8
0901.11.00	Coffee, not roasted or decaffeinated	17,618,732	UNITED STATES	Colombia, Brazil,Guatemala	0.8
8105.20.00	- Cobalt mattes and other intermediate products of cobalt	16,362,62	NETHERLANDS	Germany	0.8
1511.90.30	--- Palm olein, RBD	14,364,440	SUDAN		0.7
0304.19.00	Other	14,140,068	NETHERLANDS		0.7
7214.20.00	Iron/steel bars & rods, hot-rolled, nes, with deformations	13,066,138	SUDAN	Uganda	0.6
0901.11.00	Coffee, not roasted or decaffeinated	12,824,609	INDIA		0.6
5203.00.00	Cotton, carded or combed	12,297,914	SWITZERLAND		0.6
1801.00.00	Cocoa beans, whole or broken, raw or roasted	12,107,780	UK	Cote d'Ivoire, Nigeria, Ghan	0.6
1005.10.00	Maize seed of agricultural seed for sowing	11,288,885	KENYA	Uganda, Zambia, S. Africa	0.5
7214.20.00	Iron/steel bars and rods, hot-rolled, nes, with deformations	10,940,705	D.R.CONGO	Uganda, S. Africa, China	0.5
7210.41.00	Rolled iron/steel, >=600mm wide, plated. with zinc, corrugat	10,595,550	D.R.CONGO	Uganda, S. Africa, China	0.5
1701.11.90	--- Other	10,493,319	RWANDA		0.5
2401.20.00	Tobacco, partly or wholly stemmed/stripped	10,527,345	NETHERLANDS	Brazil, USA, India	0.5
1516.20.00	Vegetable fats and oils and their fractions, hydrogenated,	9,914,036	SUDAN	Uganda, Kenya	0.5

Source: Calculated based on UBOs Statistics, 2012

Table A 4: Uganda's Leading Export Markets and 3 leading Competitors, 2010

HSCODE	Description	Us Dollar Value	Partner Country	Leading Exporters In these Markets	Share of Total (%) Exports
0901.11.00	Coffee, not roasted or decaffeinated	59,181,922	GERMANY, FED RE	Brazil, Peru, Viet Nam	3.7
0901.11.00	Coffee, not roasted or decaffeinated	46,919,862	SUDAN		2.9
0901.11.00	Coffee, not roasted or decaffeinated	42,666,289	SWITZERLAND	Brazil, Colombia, Guatemala	2.6
0902.30.00	Black tea (fermented) and partly fermented tea in packings	36,437,557	KENYA	Uganda, Tanzania, Malawi	2.3
2523.29.00	Portland cement (excl. white)	33,675,646	RWANDA	Uganda, Tanzania, Kenya	2.1
7108.13.00	Semi-manufactured gold (incl. gold plated with platinum),	30,065,039	UAE	Australia, Uganda, Kazakhsta	1.9
0902.40.00	Black tea (fermented) and partly fermented tea, nes	27,347,652	KENYA		1.7
0901.11.00	Coffee, not roasted or decaffeinated	23,550,609	ITALY	Brazil, Peru, Viet Nam	1.5
0304.19.00	Other	22,364,387	BELGIUM		
0602.40.00	Roses	20,146,229	NETHERLANDS		1.2
0901.11.00	Coffee, not roasted or decaffeinated	20,070,799	SPAIN	Brazil, Peru Viet Nam	1.2
2523.29.00	Portland cement (excl. white)	19,978,156	D.R.CONGO	Uganda, Tanzania, Kenya	1.2
1701.11.90	--- Other	19,029,746	SUDAN	Kenya, Uganda, Tanzania	1.2
0602.10.00	Un rooted cuttings and slips	18,866,424	NETHERLANDS		1.2
0901.11.00	Coffee, not roasted or decaffeinated	16,467,494	BELGIUM		1.0
0304.19.00	Other	15,537,661	NETHERLANDS		1.0
2401.20.00	Tobacco, partly or wholly stemmed/stripped	15,485,136	KENYA	Uganda, DRC	1.0
1516.20.00	Vegetable fats and oils and their fractions, hydrogenated,	14,441,369	RWANDA	Uganda, Kenya, Zimbabwe	0.9
1801.00.00	Cocoa beans, whole or broken, raw or roasted	14,022,824	UNITED KINGDOM	Cote d'Ivoire, Nigeria, Ghana	0.9
2203.00.90	--- Other	13,811,587	SUDAN		0.9

HSCODE	Description	Us Dollar Value	Partner Country	Leading Exporters In these Markets	Share of Total (%) Exports
1701.11.90	--- Other	13,256,385	D.R.CONGO		0.8
1701.11.90	--- Other	12,720,026	RWANDA		0.8
8105.20.00	Cobalt mattes & other intermediate pdts of cobalt & article	11,137,740	NETHERLANDS	Germany	0.7
2523.29.00	Portland cement (excl. white)	10,506,407	SUDAN		0.6
7214.20.00	Iron/steel bars & rods, hot-rolled, nes, with deformations/	10,241,149	D.R.CONGO	Uganda, S. Africa, Tanzania	0.6
0304.19.00	Other	10,018,127	SPAIN		0.6
7306.90.00	Tubes, pipes and hollow profiles, riveted, of iron or steel,	9,498,074	D.R.CONGO	Uganda, S. Africa, Tanzania	0.6
1511.90.30	--- Palm olein, RBD	9,446,354	RWANDA	Uganda, Kenya, DRC	0.6
2401.20.00	Tobacco, partly or wholly stemmed/stripped	9,290,404	NETHERLANDS	Brazil, USA, India	0.6
1005.10.00	Maize seed of agricultural seed for sowing	9,286,938	KENYA	Uganda, Zambia, South Africa	0.6
0901.11.00	Coffee, not roasted or decaffeinated	9,208,747	UNITED STATES		0.6
0401.20.00	Milk & cream of >1% but =<6% fat, not concentrated or sweetened	7,555,438	KENYA		0.5
1005.90.00	Other maize (not seeds), and corn	7,501,704	KENYA		0.5

Source: Calculated based on UBOs Statistics, 2012

Table A 5: Uganda's share of leading export markets by product

Product code	Product description	Leading importing country from Uganda	Leading importer's imports from Uganda. Value 2009, US$ '000	Share of Leading importer's imports from Uganda, 2009 (%)	Market share of Uganda's Exports to the World, 2009 (%)	Top 3 leading exporters to the leading importer
710813	Gold in other semi-manufactured form n-monetary(inc gold plated w platinum)	UAE	111,595	15.6	99.8	Australia, Uganda, Kazakhstan
90240	Black tea (fermented) & partly fermented tea in packages exceeding 3 kg	Kenya	41,321	5.8	99.8	Uganda, Tanzania, Malawi
90111	Coffee, not roasted, not decaffeinated	Switzerland	39,632	5.5	21.1	Brazil, Colombia, Guatemala
90111	Coffee, not roasted, not decaffeinated	Sudan	35,356	4.9	18.8	Uganda
90111	Coffee (excl. roasted and decaffeinated)	Germany	22,572	3.1	12.0	Brazil, Viet Nam, Colombia
60240	Roses, whether or not grafted	Netherlands	20,074	2.8	96.4	Poland, South Africa, China
90111	Coffee (excl. roasted and decaffeinated)	UK	19,525	2.7	10.4	Colombia, Viet Nam, Brazil
90111	Coffee, not roasted, not decaffeinated	Singapore	15,517	2.2	8.3	Indonesia, Taiwan, Malaysia
90111	Coffee (excl. roasted and decaffeinated)	Spain	14,489	2.0	7.7	Brazil, Colombia, Germany
520300	Cotton, carded or combed	Singapore	13,791	1.9	69.4	Taiwan, India, Malaysia
60210	Un-rooted cuttings and slips	Netherlands	10,773	1.5	96.5	China, Kenya, Uganda
710812	Gold in unwrought forms non-monetary	UAE	10,424	1.5	97.0	USA, Turkey, Canada
90230	Black tea (fermented) & partly in packages not exceeding 3 kg	Kenya	8,560	1.2	99.9	Uganda, Mozambique, UK
90111	Coffee (excl. roasted and decaffeinated)	Italy	8,359	1.2	4.4	Brazil, India, Viet Nam
220300	Beer made from malt	Sudan	6,683	0.9	75.7	Uganda, Netherlands, S. Africa
240120	Tobacco, partly or wholly stemmed or stripped, unmanufactured	South Africa	6,519	0.9	29.0	Brazil, Zimbabwe, Malawi
151620	Vegetable fats &oils & fractionshydrogenated,cinter/re-esterifid,etc,refined/not	Rwanda	6,156	0.9	52.5	Uganda, USA, Malaysia
260500	Cobalt ores and concentrates	Belgium	6,016	0.8	33.3	Netherlands, Germany,
240120	Tobacco, partly or wholly stemmed or stripped,	Germany	4,999	0.7	22.2	USA, Brazil, Malawi
260500	Cobalt ores and concentrates	Netherlands	4,918	0.7	27.2	Germany,
90111	Coffee (excl. roasted and decaffeinated)	Poland	4,710	0.7	2.5	Viet Nam, Brazil, Uganda
90111	Coffee (excl. roasted and decaffeinated)	Belgium	4,698	0.7	2.5	Brazil, Colombia, France
100510	Maize (corn) seed	Kenya	4,505	0.6	40.4	Uganda, Zambia, South Africa
90111	Coffee (excl. roasted and decaffeinated)	Netherlands	4,325	0.6	2.3	Brazil, Viet Nam, Honduras

Product code	Product description	Leading importing country from Uganda	Leading importer's imports from Uganda. Value 2009, US$ '000	Share of Leading importer's imports from Uganda, 2009 (%)	Market share of Uganda's Exports to the World, 2009 (%)	Top 3 leading exporters to the leading importer
100590	Maize (corn) nes	Kenya	4,234	0.6	87.5	Mexico, Uganda, South Africa
721041	Flat rolled prod,i/nas,pltd or ctd w zinc,corrugated,>/=600m wide,nes	Rwanda	4,057	0.6	30.9	Uganda,
90111	Coffee, not roasted, not decaffeinated	USA	3,809	0.5	2.0	Colombia, Brazil, Guatemala
721041	Flat rolled prod,i/nas,pltd or ctd w zinc,corrugated,>/=600m wide,nes	DRC	3,540	0.5	26.9	Uganda, South Africa, Zambia
340119	Soap & orgn surf prep, shapd, nes; papers & nonwovens	DRC	3,330	0.5	65.7	Uganda, South Africa, Tanzania

Source: MacMap Calculation based on UNCTAD COMTRADE, 2012

Table A 6: Uganda's Export Market Share

Importers	Exported value 2010 (US$ '000)	Trade balance 2010 (US$ '000)	Share in Uganda's exports (%)	Exported growth in value 2006-2010 (% p.a.)	Ranking of partner countries in world imports	Share of partner countries in world imports (%)
World	1,618,603	-3,045,735	100.0	13		100.0
Sudan	208,567	204,739	12.9	20	108.0	-
Kenya	190,301	-321,230	11.8	21	90.0	0.1
DR Congo	183,992	176,714	11.4	39	138.0	-
Rwanda	149,345	141,956	9.2	44	173.0	-
UAE	120,889	-270,151	7.5	-15	27.0	1.0
Netherlands	89,865	-43,333	5.6	10	10.0	2.9
Germany	73,641	-54,937	4.5	12	4.0	7.0
Area Nes	72,182	72,182	4.5	26		
Switzerland	57,536	38,459	3.6	5	25.0	1.2
Burundi	51,333	50,246	3.2	23	192.0	-
Belgium	41,834	6,995	2.6	-1	13.0	2.6
Tanzania	37,612	-18,916	2.3	24	106.0	0.1
United Kingdom	36,871	-97,598	2.3	4	7.0	3.7
Spain	36,394	26,719	2.2	13	14.0	2.1
Italy	31,389	-37,743	1.9	27	8.0	3.2
Singapore	23,983	-65,964	1.5	-7	15.0	2.0
China	21,988	-392,670	1.4	28	3.0	9.2
USA	21,442	-84,088	1.3	16	2.0	12.9
H. K, China	18,865	-16,690	1.2	14	9.0	2.9
India	13,905	-670,505	0.9	76	17	1.8
Poland	12,688	-16,156	0.8	33	24	1.2
France	12,370	-52,135	0.8	-23	6	3.9
Viet Nam	11,140	-1,635	0.7	26	33	0.6
Portugal	10,768	10,420	0.7	16	38	0.5
South Africa	10,269	-240,115	0.6	7	36	0.5
Israel	6,889	-898	0.4	-11	45	0.4
Denmark	6,503	-12,425	0.4	113	35	0.6
Turkey	5,477	-17,621	0.3	43	21	1.2
Russian Fed.	5,226	-44,173	0.3	37	19	1.6
Somalia	3,720	3,720	0.2		184	0

Source: ITC Calculation based on UNCTAD COMTRADE, 2012

Table A 7:Trade Partners' Share in Uganda's Imports

Exporters	Imported value 2010 (US$ '000)	Trade balance 2010 (US$ '000)	Share in Uganda's imports (%)	Imported growth in value 2006-10 (%, p.a.)	Ranking of partner countries in world exports	Share of partner countries in world exports (%)
World	4,664,338	-3,045,735	100	15		100
India	684,410	-670,505	14.7	32	19	1.5
Kenya	511,531	-321,230	11	6	104	0
China	414,658	-392,670	8.9	29	1	10.5
UAE	391,040	-270,151	8.4	4	28	1
Japan	305,533	-303,170	6.6	14	4	5.1
South Africa	250,384	-240,115	5.4	12	39	0.5
Saudi Arabia	239,295	-238,990	5.1	54	17	1.7
U.K	134,469	-97,598	2.9	3	10	2.7
Netherlands	133,198	-43,333	2.9	26	6	3.3
Germany	128,578	-54,937	2.8	13	3	8.5
Indonesia	113,541	-112,341	2.4	75	27	1
USA	105,530	-84,088	2.3	2	2	8.5
Malaysia	100,507	-99,461	2.2	18	21	1.3
Singapore	89,947	-65,964	1.9	24	14	2.3
Rep. of Korea	80,660	-77,091	1.7	36	7	3.1
Italy	69,132	-37,743	1.5	19	8	3
France	64,505	-52,135	1.4	17	5	3.4
Kuwait	62,523	-62,522	1.3	62	46	0.4
Tanzania	56,528	-18,916	1.2	18	113	0
Brazil	50,325	-50,093	1.1	68	22	1.3
Russian Fed.	49,399	-44,173	1.1	8	12	2.7
Thailand	49,003	-48,901	1.1	27	24	1.3
Ukraine	48,345	-46,807	1	28	52	0.3
Sweden	45,508	-43,364	1	-2	26	1.1
Egypt	44,952	-44,017	1	27	61	0.2
H. K, China	35,555	-16,690	0.8	11	11	2.7
Belgium	34,839	6,995	0.7	-3	9	2.7
Poland	28,844	-16,156	0.6	56	25	1.1
Pakistan	26,500	-26,434	0.6	22	66	0.1
Turkey	23,098	-17,621	0.5	19	33	0.8

Source: ITC Calculation based on UNCTAD COMTRADE, 2012

Table A8: Results for the exports -2001-2009 (Random effect, Dynamic Random Effect and the IV GMM)

Variable	RE	Dynamic RE	IV GMM
Constant	-191.2 (208.7)	-209.6 (240.2)	-213 (238.1)
Exports Lagged		0.504 (0.0233) ***	0.504 (0.0275) ***
Distance	-0.365 (0.34)	-0.184 (0.14)	-0.184 (0.218)
Importer's GDP	0.393 (0.114) ***	0.330 (0.0917) ***	0.331 (0.102) **
Importer's Population	0.774 (0.119) ***	0.604 (0.096) ***	0.604 (0.0878) ***
Uganda's GDP	-3.406 (9.793)	-1.522 (10.92)	-1.602 (11.19)
Uganda's Population	11.48 (13.98)	11.93 (16.04)	12.15 (16.06)
Importer's Infrastructure	-0.0364 (0.157)	-0.107 (0.14)	-0.107 (0.152)
Uganda's Infrastructure	-0.0107 (0.876)	-0.541 (0.98)	-0.549 (0.955)
Importer's FCR	0.393 (0.142) **	0.142 (0.0992)	0.142 (0.104)
Real Exchange rate	-0.116 (0.743)	0.914 (0.907)	0.914 (1.022)
EAC dummy	5.724 (2.588) *	3.026 (1.061) **	3.026 (0.843) ***
Asia dummy	2.178 (1.063) *	0.765 (0.454)	0.765 (0.444)
COMESA dummy	4.286 (1.117) ***	2.269 (0.477) ***	2.268 (0.47) ***
EU dummy	3.795 (0.803) ***	2.079 (0.37) ***	2.079 (0.366) ***
Border dummy	4.944 (2.227) *	2.105 (0.922) *	2.105 (0.612) ***
Island dummy	-1.265 (0.852)	-0.655 (0.325) *	-0.655 (0.321) *
Locked dummy	-1.561 (0.776) *	-0.22 (0.362)	-0.221 (0.366)
Language dummy	2.615 (0.698) ***	0.997 (0.295) ***	0.997 (0.268) ***
R squared			0.60
Overall	0.43	0.60	
Between	0.60	0.91	
Within	0.05	0.015	

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Table A 9: Results for the imports -2001-2009 (Random effect, Dynamic Random Effect and the IV GMM)

Variable	RE	Dynamic RE	IVGMM
Constant	102.2 (-183.1)	186.5 (-216.3)	188.5 (-207.4)
Lagged imports		0.614 (-0.0209) ***	0.614 (-0.0259) ***
Distance	-0.23 (-0.348)	-0.288 (-0.125) *	-0.288 (-0.169)
Exporter's GDP	0.282 (-0.0964) **	0.220 (-0.0642) ***	0.220 (-0.0791) **
Exporter's Population	0.229 (-0.0955)*	0.376 (-0.063) ***	0.377 (-0.0785) ***
Uganda's GDP	5.101 (-9.702)	5.639 (-11)	5.653 (-10.78)
Uganda's Population	-7.156 (-12.29)	-12.47 (-14.34)	-12.6 (-13.68)
Exporter's Infrastructure	0.633 (-0.126) ***	0.515 (-0.106) ***	0.515 (-0.123) ***
Uganda's Infrastructure	0.443 (-0.777)	0.544 (-0.892)	0.549 (-0.871)
Uganda's FCR	-0.282 (-0.938)	-0.391 (-1.332)	-0.386 (-1.383)
EAC dummy	5.981 (-2.701) *	2.229 (-0.962) *	2.229 (-0.596) ***
Asia dummy	5.735 (-0.965) ***	1.450 (-0.379) ***	1.450 (-0.328) ***

Variable	RE	Dynamic RE	IVGMM
COMESA dummy	4.010 (-1.151) ***	1.613 (-0.419) ***	1.613 (-0.402) ***
EU dummy	3.503 (-0.807) ***	0.822 (-0.317) **	0.822 (-0.293) **
Border dummy	2.45 (-2.328)	0.639 (-0.827)	0.639 (-0.458)
Island dummy	-3.300 (-0.857) ***	-0.724 (-0.323) *	-0.724 (-0.337) *
Locked dummy	-2.735 (-0.758) ***	-0.53 (-0.275)	-0.53 (-0.297)
Language dummy	1.880 (-0.713) **	0.633 (-0.257) *	0.633 (-0.232) **
R squared			0.673
Overall	0.382	0.673	
Between	0.488	0.953	
Within	0.0577	0.0217	

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

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