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ABSTRACT

The paper investigates the potential impact of the EAC (a South-South Regional grouping) on trade creation and diversion. The paper seeks to establish whether the EAC Regional Trade Agreement has diverted or created trade using an expanded (augmented) gravity model. The paper departs from the conventional estimation approach that uses average combined trade flows as the dependent variable which is prone to errors and uses exports. We estimate static and dynamic random effects models using a panel data set from 2001 to 2011 on seventy countries that trade mainly with the EAC partner states. Results suggest that indeed the implementation of the EAC treaty has created trade contrary to widely held views that South-South RTAs largely divert trade. There is thus evidence that the EAC, a south-south RTA has been a more trade creating than trade diverting as espoused in the literature. The paper explains the possible measures that have helped generate the trade underscored; formulation and implementation of EAC medium term development strategies, removal of internal tariffs and adoption of a CET structure. The paper further highlights that although progress has been made in other areas, there are challenges that need to be addressed to deepen the EAC integration: persistence of NTB; lack of a common policy with regard to partner states' trade policies to non-partner states; the lack of standardised customs formalities; the lack of harmonised procedures; and different approaches to investment and export promotion. It is recommended that; the region adopts a legally binding approach to NTBs, harmonises trade policies and standardises documentation and procedures.

Key words

Gravity model, imports, exports, intra and extra EAC,trade creation, trade diversion, trade flows, RTA,regional integration

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1.0 INTRODUCTION

In the last two decades international trade has experienced dramatic increase in Regional Trade Agreements. At least every country on the globe subscribes to some sort of a bloc and substantial amount of trade in the world takes place within such agreements. Between 1948 and 1994 there were only 124 Regional Trade Agreements notifications, however between 1995 and 2008, there were additional 300 notifications made. By January 2012, about 511 RTAs, (taking goods and services notifications separately), had notified the GATT/WTO[1]. At that same date, 319 agreements were in force[2]. Governments have the liberty to pursue two broad options when seeking to liberalize trade; namely unilateral and preferential liberalization (Kandogan, 2005). In both instances, there are welfare improving end points especially when trade creation takes place. Trade liberalization has been an important part of East Africa's policy agenda since the countries embarked on liberalising their inter-state trade as part of the regional integration process. This is exemplified by the number of trade initiatives, specifically economic integration agreements that the region is involved in, such as the East African Community (EAC), the Common Market for East and Southern Africa (COMESA) and South African Development Corporation (SADC) for Tanzania[3]. The EAC is composed of five partner states; Burundi, Kenya, Tanzania, Rwanda and Uganda[4].

A number of provisions to increase the EAC intra-trade are enshrined in the treaty leading to the formation of the EAC. Article 75 of the Treaty and the Customs Union (CU) Protocol provides a number of elements including (i) elimination of internal tariffs and other charges of equivalent effect (ii) elimination of non-tariff barriers; (iii) establishment of a Common External Tariff (CET); (iv) duty drawback, refund and remission of duties and taxes, among others. It was anticipated that implementation of these provisions would increase the value and volume of trade within the EAC. The rationale for regional integration include among others the benefits of trade creation, greater economies of scale based on profitable competition, increased investment, and improved bargaining power. Article 25 of the EAC CU protocol highlights the commitment of Partner States to support export promotion schemes in the Community for the purposes of accelerating development, promoting and facilitating export oriented investments, producing export competitive goods and attracting foreign direct investment. These and others are among the efforts to boast intra-EAC trade.

There are conflicting views with regard to trade diversion and creation in South-South Regional Trade Areas (RTAs). Yeats (1998) expresses a pessimistic view arguing that promoting intra-regional trade has potential

1 General Agreement on Tariffs and Trade/World Trade Organisation

2 http://www.wto.org/english/tratop_e/region_e/region_e.htm (December 3rd 2012)

3 All EAC countries belong to the African Union (AU). Kenya and Uganda belong to the Inter-Governmental Authority on Development (IGAD); Burundi, Kenya, Rwanda, and Uganda belong to the Common Market for Eastern and Southern Africa (COMESA); and Tanzania belongs to SADC. Kenya and Tanzania are also active members of the Indian Ocean RimAssociation for Regional Cooperation (IOR-ARC). Burundi and Rwanda similarly participate in the Economic Community of Great Lakes Countries (CEPGL).

4 The Treaty for the establishment of the EAC was signed on 30th November 1999 and came into force on 7th July 2000. The EAC Customs Union Protocol was signed on 2nd March 2004 and came into force on 1st January 2005.

adverse effects on member countries and on third party countries and have a negative effect on Africa's industrialization and growth.

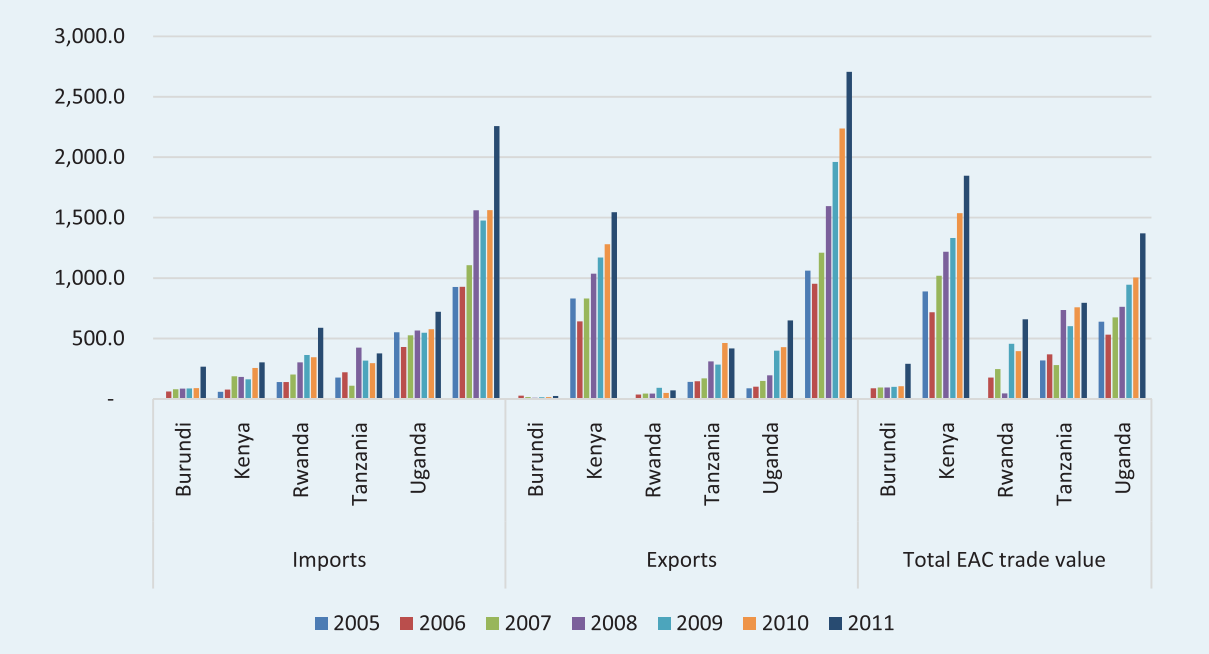
A World Bank, (2000a) report argues that South-South RTAs generate trade diversion especially when CETs are high and the member states are poor. Others who hold similar views include Park (1995), and Schiff (1997). On the other hand Cernat (2006) argues that, South-South RTAs are not more trade diverting than other RTAs implying that it is case by case. This view is supported by Elbadawi (1997) who argues that integration in Africa is key to generating the threshold that can trigger growth through complementarities. Using a Computable General Equilibrium model, Evans (1998) found a net positive effect of the Southern Africa regional integration initiative. Buigut (2012) uses a modified gravity model to estimate trade effects of the EAC CU on individual member countries and concludes that the CU has generated disproportionate impact on intra-EAC exports and imports. There is thus lack of conclusive evidence with regard to trade creation and diversion. These are pointers to the fact that the debate is ongoing deserving more empirical evidence.

1.1 Intra EAC trade 2005 - 2010

Following the implementation of the EACCU in 2005 the value of intra-EAC trade steadily increased and more than doubled from US$1.8 billion in 2005 to US$4.9 billion in 2011 (Appendix A Table A1). This is reflected in the share in total EAC trade which improved from 7.8 percent to 11.4 percent (WTO, 2012), although significant differences exist with respect to specific member states. In spite of the growth in intra-EAC trade performance there are impediments like poor infrastructural services, mainly physical infrastructure (roads and rail), and high costs of energy, resulting in high costs of doing business that make it difficult to boost trade. Figure 1 demonstrates that Kenya is the largest contributor to intra-EAC exports (57.2 percent of the total in 2010) and Uganda is the largest regional importer (37 percent of intra-EAC imports in 2010). Kenya overall contributed to an average share of over 40 percent of total intra-EAC trade and enjoyed a trade surplus with its EAC partners during the period.

The region has undertaken a number of trade policy measures to increase and boost intra-EAC trade and trade with the rest of the world: The Internal Tariffs (IT) along borders of partner states have been fully removed and the EAC CET has been fully operationalized. There are however challenges of overlapping membership of the EAC countries to various regional arrangements which also poses a challenge for the EAC due to different rules of origin requirements and these include Tanzania in SADC and the rest of the EAC partner states in COMESA. Non-tariff barriers (NTBs) remain a major impediment to regional trade and these include: non-harmonised technical standards, sanitary and phyto-sanitary requirements, customs procedures and documentation, different rules of origin regimes and road blocks (Okumu and Nyakori, 2010). The establishment of the National Monitoring Committees (NMCs) in all the EAC members to address these NTBs has fully not yielded the anticipated results.

Figure 1: Total intra-EAC trade, 2005-2010 (US$ million)



Data Source: East African Community Facts and Figures - 2012. ARUSHA, TANZANIA. EAC Secretariat, 2012

1.2 EAC trade with the rest of the world

On the other hand total EAC trade with the rest of the world has continued to be dominated by imports. This is explained by the limited stock of technology at the regional level compelling the EAC partner states to import high technology manufactures from the rest of the world. The goods are mainly imported from the European Union, United States of America, Asia and other African countries. According to (WTO, 2012), the value of EAC trade with the rest of the world fell from US$31 billion in 2008 to US$28.8 billion in 2009. This is explained by the global economic crisis on both imports and exports. However, when the value of trade with the rest of the world is compared to the intra EAC – standing at only US$4.9 billion in 2011, the partner states have a long way to go to increase their intra-regional trade.

1.3 Objectives

As echoed in the literature, the debate on whether south–south RTAs create or divert trade is inconclusive. Although trade volumes among the EAC partner states have increased, there is limited empirical evidence with regard to trade creation and diversion. The paper seeks to establish whether the EAC RTA has diverted or created trade. Specifically the study seeks to:

1. Establish whether trade has been diverted as a result of the CET adopted by the EAC;
2. Establish whether trade has been created by the EAC regional integration; and
3. Propose policy options/measure for deepening the EAC regional trade.

1.3 Policy Relevance

This paper will provide a basis for formulating polices that seek to deepen the EAC regional trade. The paper will thus guide policy makers on key interventions to deepen the regional trade.

The rest of the paper is organised as follows: Section II is review of the literature, Section III gives the augmented gravity model as used in the paper and the data sources, section IV presents and discusses the findings and section V makes the conclusions and policy suggestions.

2.0 REVIEW OF LITERATURE

Trade theories explain why countries seek to integrate. Richado in the classical theory of trade argues that trade raises a country's potential income (welfare) compared to autarky through specialization according to comparative advantage. Therefore countries shift resources to production of goods where they efficiently produce and import goods where they are less efficient. Since in the real world, the existence of tariff and NTBs distorts the final consumer price regional integration overcomes this challenge. On the other hand Heckscher Ohlin (O-H) model 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. Therefore countries with relatively large quantities of labour will shift production to labour intensive production and export these goods and import capital intensive goods. There has been renewed interest in regional trade agreements in the past decade especially after the Doha Round talks stalled. The debate questions, the impact of RTAs on partner states and third countries (see for example World Bank 2000a; Yeats (1998; Schiff (1997; and Park (1995). The theoretical foundation to make such analysis is embedded in the Viner's (1950) seminal work which advanced the idea of ambiguous welfare effects that result from formation of an RTA.

When barriers are dropped, markets become enlarged giving more efficient producers' entry into countries where prices had artificially been high due to the duties and other trade barriers. This brings into play the concepts of trade creation and diversion[5]. McIntyre (2005) argues that the assessment of the static effects of forming an effective RTA, hinges on three important principles from the theory of integration, namely, allocation/efficiency, competitiveness and complementarity: Efficiency gains of economic integration depend on whether the products from partner states are in direct competition with, or complementary to each other. This means that considerable overlap in the range of commodities produced by partner members is critical for determining efficiency gains. The overlap should be accompanied by significant differences in production costs between members, to ensure leverage in terms of more efficient allocation of resources. The EAC partner states among themselves are likely to have a narrow range of exports of goods and services. This typically limits the scope for efficiency gains but does not eliminate them altogether.

Complementarity exists when partner states of an RTA produce commodities that do not compete, but rather complement. Complementarity is usually characterised by the usual trade diversion and trade creation. The trade agreements between the North and the South tend to complement, where the south produces inputs and the north

5 Trade diversion occurs when a free trade area (in this case the EAC CU) shifts (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) increases (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

produces final products owing to the limited processing capacities of the former. Of course perpetuating this kind of arrangement is at the disadvantage of the south. It is argued that because RTAs give preferential treatment to member countries, they divert trade from non-member, probably least-cost suppliers to members who are high-cost suppliers (Bhagwati and Panagariya, 1996; and Panagariya, 1998, and 1996). This is interpreted as an impediment to multilateral trade liberalization and as such trade diversion dominates trade creation. In instances where the rest of the world is the least cost supplier and faces constant costs, an RTA with the supplier who faces increasing costs diverts trade and the liberalizing country forfeits tariff revenue (Robinson *et al.,* 1999). In contrast, when the RTA partner is the supplier facing constant costs, there are benefits from the price reduction in addition to tariff revenue from the countries excluded from the RTA. However, as Panagariya (1996) argues, usually the rest of the world, not the RTA partner, faces constant costs while RTA members face increasing costs. Therefore given such a scenario, whereas trade creation will take place for some commodities, for the goods coming from a partner with increasing costs — trade diversion will dominate the RTAs.

De Melo *et al.,* (1993) instead present a mild view arguing that integration both creates and diverts trade. Likewise, De Rosa (1998) provides a balanced view of the theoretical models which demonstrate both trade creation and diversion in a situation where an RTA is formed either with a partner facing constant or increasing cost. He presents the Meade model where both international and domestic relative prices have a possibility to adjust in a general equilibrium framework. In this framework a country entering a regional trade agreement and increases its imports from all sources, improves its welfare. He goes further to propose that to prevent trade diversion, RTA member countries should reduce trade barriers with non-member countries as they do for members. Others have used theoretical models (CGE) to analyse RTA impact given their advantage of being economy-wide and multi-sectoral models (see for example, Brown 1993; Francois and Shiells, 1994; Shinyekwa and Mawejje, 2013). It is evident in the literature that theoretical models give an ambiguous picture with regard to the net impact of an RTA on trade creation and trade diversion. Robinson *et al.,*(1999) suggest that the impact depends on the export capacity of the partner country and whether the partner country faces constant costs. Panagariya (1998) argues that an RTA can be net trade-creating in one sector and net trade-diverting in another sector. What is common in these studies is that they analyse macro-economic, welfare and sectoral impacts and very limited analysis on trade creation and diversion.

The literature on RTA using gravity models dwells more on determinants of trade and less on trade creation and diversion. Zarzoz and Lehmann (2003) apply a gravity model to assess Mercosur-European Union trade and the trade potential following trade agreements between the two blocs and establish that belonging to either bloc fosters trade. Yeats (1998) established that intra-Mercosur trade between 1979 and 1994 increased and in some cases very dramatically. Laaserand Schrader (2006) analyse the Baltic trade flows and establish a strong trade link between Estonia, Lativia, Lithuania

and the European Union (EU) suggesting trade creation following their joining the EU common market. Foroutan and Pritchett (1993) looks at intra-trade in Sub Saharan African using gravity model and concludes that despite the proliferation of RTA in Sub Saharan African there is very limited intra-trade suggesting limited trade creation. Cernat (2001) assesses regional trade arrangement in South-South RTA[6] and establishes that contrary to the feared negative impacts they are not more trade diverting than other RTAs. Buigut (2012) estimates the trade effect of the EAC customs union on each individual member and concludes that the customs union has generated disproportionate impact of intra bloc exports and imports for individual members. However, this study does not analyse the trade diversion and creation impact of the EAC.

There are extreme studies that have painted a rather pessimistic picture of RTAs especially in developing countries (South-South). They base their argument on the similarity of resource endowment of the partner members which in their view makes it hard for them to increase intra-regional trade. Naya and Plumber (1991) reported the failureof the Association of Southeast Asia Nations (ASEAN) after a decade to increase intra-bloc trade above its level of 15 percent to 20 percent of total trade. According to World Bank (2000a) South–South RTAs are non-edifying as they generate trade diversion which reduces welfare in circumstances when tariffs are high instead of reaping economic benefits like increase in intra-trade. Yeats (1998) argues that intra-regional trade has a potential to create adverse effects especially on third party member countries among Sub-Saharan Africa and concludes that intra-trade is likely not to make an important impact on the partner countries and may negatively impact Africa's industrialization. Schiff (1997) is rather more radical about RTAs in the South since, as he argues, RTAs between small countries increase the likelihood of partners switching from cheaper imports from low cost third party members to higher cost partner members. This is best explained by Park (1995) and Derosa (1998) who argue that when the intra-regional trade shares are small in total trade, there are more chances of trading blocs diverting trade. The evidence is thus inconclusive requiring further work.

6 (AFTA, CARICOM, COMESA, ECOWAS, MERICOSUR and SADC)

3. ANALYTICAL FRAMEWORK AND METHODS

3.0 Introduction

This section presents the analytical framework and the different methods applied in the analysis. We start with the Finger-Kreinin Index, proceed to give a theoretical foundation for the gravity model and then the modelling of the augmented gravity model. The section then details the estimation procedure, the diagnostics tests and concludes with data sources

3.1 Finger-Keinin Index (FK)

The FK index provides a measure of the similarity of the trade pattern of any pair of countries. The analysis is based on the FK index (Finger and Kreinin, 1979) in the Trade Sift Software with data from WITS-UNCTAD COMTRADE[7]. It reveals the degree of similarity between the export structures or production between two countries. It also shows whether there are any significant changes in the trade structures among the countries in a given economic bloc or bilateral arrangement. It is a useful analytical index in the context of a regional trade agreement with regard to the likely impact on the partner countries of the agreement, and the likely impact on the excluded country or countries. It thus, provides a useful benchmark in examining the issues of trade creation and trade diversion. It is also useful in conducting a Trade Tracker analysis as it may help to identify key competitor countries in particular sectors or across a range of products. The FK by destination is:

$$FK_{i_1 i_2 j} = \sum_k min\left[\left(\frac{x^k{}_{i_1 j}}{X_{i_1 j}}\right), \left(\frac{x^k{}_{i_2 j}}{X_{i_2 j}}\right)\right] \quad \text{.....1}$$

Where, i_1 and i_2 represent the two source countries and j the destination country. While x^k refers to the trade flow in product *k*; X to the total trade flow. Therefore, $\frac{x^k{}_{i_1 j}}{X_{i_1 j}}$ is the share of product *k* in country *i*'s total exports to the destination partner *j*. Likewise, $\frac{x^k{}_{i_2 j}}{X_{i_2 j}}$ the share of product *k* in the comparator country's (i_2) total exports.

The FK results range between 0 and 1. Thus, when the result is 0, it would imply that the two countries' export structure is completely divergent. The products that country *i* exports are not traded between the two countries. To the contrary, if the result is 1, the two structures are identical. In that case, both countries export similar products and with the same intensity though they may differ in size. Likewise, if two countries' export products are similar, trade creation is more likely to occur since both countries can choose to import from the more efficient supplier. On the other hand, if they are different, preferential agreement could lead to trade diversion.

3.2 The gravity model

The application of the gravity model to assess and analyse international trade flows was first applied in the 1960s. Since then, gravity models have been widely used. Early studies using gravity models (Tinbergen, 1962; Poyhonen, 1963; and Linnemann, 1966) were *ad hoc,* and lacked solid theoretical foundations. The application of gravity models to economic interchange and trade was in the past criticised as lacking basis and

7 WITS is World Integrated Trade Solutions, -UNCTAD is United Nations Conference on Trade and Development and COMTRADE is Commodity Trade

foundation from trade theory (Matyas *et al.* 2000). It was argued that the model lacked the ingredients of the prominent models of international trade that included the Ricardian model, (differences in technology) and the Heckscher-Ohlin (HO) model (differences in factor endowments) as the basis for trade (UNCTAD and WTO, 2012). This view has so far been reconsidered owing to more enlightening empirical work and details as reviewed in Shinyekwa and Othieno (2013). Specifically, the works of Anderson (1979), Bergstrand (1990), Deardorff (1998), and Feenstra, *et al,*(1998) have since resolved this problem providing relevant trade theories.

The debate now as explained by Baldwin and Taglioni (2006) is on the errors that different specifications of the gravity model face in the literature. The three errors are the gold, silver and bronze medal errors. Respectively they refer to the multilateral resistance terms which are always omitted and yet they are correlated with trade costs, averaging the reciprocal trade flows[8], and inappropriate deflation of trade flows. Baldwin and Taglioni (2006) extensively reveals the problems and suggests how these problems can be addressed which the current study adopts. We use direction specific data (exports) and not averaged bilateral trade databased on trade theory that asserts that gravity models hold for each and every uni-directional trade flow. Cernat (2001) argues that using bilateral trade flows as a dependent variable for a given pair of countries fails to discriminate the impact of RTA formation on exports from non-member to RTA members and exports from the RTA members to the non-member.

We use the log-linear form of the gravity equation to estimate the trade creation and diversion effects of the EAC RTA, using a panel regression analysis. The gravity equation helps to analyse the evidence of trade diversion through ex-post analysis of trade flows. We use the export trade flows as the dependent variable, in log form, from country *i* to country *j* at a given time *t* – 2001-2011. The gravity equation demonstrates the relationship between the natural logarithm of the monetary value of trade between two countries and the log of their respective GDPs, a composite term measuring barriers and incentives to trade between them.

$$X_{ij_t}=f(Y_{it},Y_{jt},D_{ij}) \quad \text{.....(2)}$$

Where *Xijt* are exports from country *i* to country *j* at time *t*. *Yit* and *Yjt* are the GDPs at time *t* of country *i* and *j*, respectively[9]. The distance between the two capital cities of the two countries is defined as D_{ij}. Therefore bilateral trade flows are dependent upon the size of the two economies and the distance between them. Whereas a high level of income in the exporting country indicates a high level of production leading to more products for export, high level of income in the importing country suggests higher demand and therefore, higher imports. In this case, both Y_{it} and Y_{jt} are positively correlated with the level of bilateral exports. $Yppc_{it}$+ $Yppc_{jt}$ are the per capital incomes at time *t* of country *i* and *j*, respectively. The choice of the per capita income is meant to reflect the population impact that is implied in the effective demand for commodities among the trading partners.

8 The basic theory of the gravity equation is a modified expenditure function, that is, it gives us the value of expenditure by a country on goods produced by another country. This implies that the gravity model explains uni-directional bilateral trade. However, most gravity models estimated use the average of the two-way exports between the two countries

9 Later in the model we will define another country k to represent countries outside the EAC RTA

In this case, both $Yppc_{it}$ + $Yppc_{jt}$ are positively correlated with the level of bilateral exports. The coefficient for distance is expected to be negative since distance increases transport costs. Finally, ε_{ij} is the log normally-distributed error term. For estimation purposes, the basic gravity model is most often used in its log-linear form. We interpret the parameters of the estimated equation in logarithms as elasticities as specified in equation 3.

$$In(X_{ij,})=\alpha+\beta_i In(Y_{it})+\beta_j In(Y_{jt})+\beta_i In(Yppc_{it})+ \beta_j In(Yppc_{jt})+\beta\ In\ (D_{ij}) + \varepsilon_{ij} \quad \text{..... (3)}$$

It is also common to expand the basic gravity model by adding other variables, which are thought to explain the impact of various policy issues on trade flows. Traditionally, the augmented version of the gravity model assessing the impact of RTAs has other dummy variables added. Empirically, trade costs are traditionally captured as distance between the two countries. However, additional variables are also used and these include dummies for islands, landlocked countries and common borders. According to UNCTAD and WTO(2012) they reflect the fact that transport costs increase with distance and that they are higher for landlocked countries and islands but are lower for neighbouring countries. The coefficients for the land locked and islands dummy variables are expected to be negative while the common border is positive due to proximity. Other dummy variables are used to capture information costs and these include common language, adjacency or other relevant cultural features such as colonial history. $In(RER_{ij})_t$ 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.

The variable of interest is the RTA, taking two countries *i* and *j* in a common RTA (for example Uganda and Kenya) and country *k* (Zambia) that is not. If *i* imports more from *j* and less from *k* following integration, then trade diversion will have taken place. On the other hand if *i* imports more from *j* and *k*, following integration, then trade creation is said to have taken place. A number of approaches have been proposed to model trade creation and diversion effects of an RTA: UNCTAD (2012) and Cernat (2001) propose that if *i* and *j* are members of the RTA at time *t* we assign them 1 and 0 otherwise (*k*). This dummy is intended to capture the increase in exports from EAC members as a result of RTA formation. This means that Uganda, Kenya, Tanzania, Burundi and Rwanda take the value of 1 (also referred to as *bothinEAC*). Countries out of the EAC region will take 0. The other dummy captures trade between a member of the EAC and trading partners outside the EAC, which is given 1 and 0 for trade between both countries outside the EAC. We will refer to this dummy as *oneinEAC*. The dummy is intended to approximate the change in exports from third countries to the EAC member as a result of formation of the EAC. In case of a decrease in exports from more efficient third country exporters (k), this variable is interpreted as trade diversion. However, if there is an increase in exports from third countries as a result of EAC formation this dummy should be interpreted as trade creation. Therefore when both coefficients are positive and significant it suggests that trade creation has taken place. However, when the *bothinEAC* is positive but *oneinEAC*is negative it means trade diversion has taken place. This implies

that the interpretation of the two dummy variables can be done jointly. Including all the other variables leads to the following specification:

$$ln(X_{ij,t})=\alpha_0+\beta_1 ln(Y_{it})+\beta_2 ln(Y_{jt})+\beta_3 ln(Yppc_{it})+ \beta_4 ln(Yppc_{jt}) + \beta_5 ln(D_{ij})+\beta_6 border+\beta_7 llocked+ \beta_8 lang+ \beta_9 island+\beta_{10} bothinEAC +\beta_{11} oneinEAC+\beta_{12} ln(RER_{ij})_t+\varepsilon_{ij}.....(4)$$

3.3. The estimation procedure

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. We run a FE model and save the estimates, then run a RE model and save the estimates, then perform the tests. Since the results are not significant 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 strong evidence of the significant difference across the countries and therefore we cannot run a simple ordinary least squares (OLS). Finally we include a lag of exports since bilateral agreements and trade preferences 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. The 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.

3.4 Diagnostic tests

We checked multi-collinearity in the model by conducting the simple correlation test that reveals the coefficients between the explanatory variables. Results demonstrated that the values of the correlation coefficients between explanatory variables are lower than 0.80. Studenmund (2001[10]) argues that below such a threshold the model is fine, therefore we concluded that there is no serious problem. We conducted Unit root tests to determine a potentially co-integrated relationship between the variables. When all the variables are stationary, the traditional estimation methods can be used to estimate the relationship between the variables. However if the variables are non-stationary, a test for co-integration is required. We conducted the Levin *et al.* (2000)[11] test of panel unit roots that assume that the autoregressive parameters are common across countries. Levin, Lin and Chu (LLC)

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

11 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

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.

3.5 Data

We obtained export trade data from the COMTRADE and World Integrated Trade Solutions (WITS) database. We included seventy five countries[12] which mainly trade with the EAC partners based on the value of trade that exist among them. The data for distances were extracted from the distance calculator website[13] which is defined as direct distance between the capital cities of a pair of trading partners without taking into consideration the actual routes by either forms of transport. The GDP, per capita income, and real exchange rate data were taken from the World Bank Development Indicators (WDI) of the World Bank. The data on whether, a country is land locked or not, is an island or not, borders a trading partner or not and has the same official language or not were extracted from the Centre d'Etudes Prospectivesetd'InformationsInternationales (CEPII)[14] gravity dataset. The analysis is done for the period 2001 to 2011 which covers the implementation of the EAC regional integration.

12 The countries are in the Appendix

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

14 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)

4.0 FINDINGS

4.1 Introduction

This section presents the results of the Finger-Kreinin Index and the estimation results of the gravity model. This is followed by a discussion that explains why trade has been created within the EAC and further highlights the areas that need policy intervention to deepen the EAC integration. Finally, a conclusion is made underpinning the emerging policy issues.

4.2 The FK index results

The result in Table 1 suggests that the trade pattern among the EAC partner states had limited similarity over the period 2005-2010. The fact that the index has values closer to zero than to one attests to this. Had the index been around 0.5 or even higher, then this would have suggested an even stronger relations between the partners' exports. This in one way would imply that the preferential trade agreement under the EAC customs union has to a limited extent created trade or no overlap in production and export bundles. The conclusion emerging from this analysis is that the regional engagement in the EAC customs union has generated limited trade creation arising from the preferential trade liberalisation since 2005.In this case therefore, championing deeper integration through full implementation of a single customs territory and clearing existing barriers to both goods and services trade would foster trade creation on the consumption side but also increase complementarity of trade among the EAC partner states.

Table 1: Finger-Kreinin Index for Uganda and EAC partners 2005-2010

Reporter 1	Reporter 2	2005	2006	2007	2008	2009	2010
Burundi	Rwanda	0.1	0.1	0.4	0.3	0.4	0.2
Burundi	Tanzania	0.1	0.1	0.1	0.2	0.2	0.1
Burundi	Uganda	0.1	0.0	0.1	0.1	0.1	0.1
Burundi	Kenya	0.0	0.1	0.1	0.1	0.0	0.1
Kenya	Tanzania	0.2	0.2	0.2	0.2	0.2	0.2
Kenya	Uganda	0.2	0.2	0.2	0.2	0.2	0.3
Kenya	Rwanda	0.1	0.1	0.1	0.0	0.1	0.1
Rwanda	Uganda	0.3	0.1	0.1	0.2	0.1	0.2
Rwanda	Tanzania	0.1	0.1	0.1	0.1	0.2	0.1
Uganda	Tanzania	0.3	0.2	0.2	0.3	0.1	0.2

Source: Calculation based on Trade Sift, 2013

4.3 Estimation results

Table 2 gives the estimation results of the impact of the EAC RTA on trade specifically trade creation and diversion. The dependent variable is the log of real exports of the EAC countries and their 70 major trading partners as illustrated in Appendix A Table A2; The estimation of gravity model for trade flows in the literature has been done with limited consideration of past trade and trade agreements on trade flows. Trade is dynamic and any efforts undertaken to increase trade flows like trade facilitation, signing regional agreements and access to Generalised System of Preferences (GSP) is likely to gain momentum over time. In this paper the progressive implementation of the EAC treaty and protocols is captured by a lag of the exports and a dummy variable breaking the period into two (2001-2004 and 2005 - 2011) and to achieve the former, we extend the standard static RE gravity model to a dynamic one.

The ultimate purpose of this paper is to estimate the trade creation and diversion effects of the EAC trade agreement on partner states. In interpreting our results we examine the levels of significance and coefficients of the estimations, particularly those relating to *intra* and *extra* EAC trade trends. In addition, other pertinent model variables are interpreted in respect of their impact on the EAC overall exports. The results demonstrate the different estimations undertaken as discussed in section 3.3. The discussion is based on the static and dynamic RE estimations. Overall the two models have similar results and their explanatory power is quite high and reasonable. The overall R-Squared for the static RE is 0.53 and 0.56 for the dynamic RE suggesting that more than a half of the variation in trade flows is explained by the variables used in the model. The Wald chi2 test(for panel models) clearly shows that the model is a good predictor (goodness of fit) with the probability of less than one percent.

With the exception of the importer's per capita income, for all the models the estimated coefficients present the expected signs and magnitudes. Whereas under the static RE, a 10 percent increase in the per capita income of the exporters increases trade by 2 percent, the dynamic models estimates a 1.7 percent increase in trade. The per capita income elasticities of the importers on the other hand are negative and extremely small in magnitudes. The income elasticities (GDP) are positive and highly significant clearly demonstrating that GDP is highly correlated with trade flows. A 10 percent increase in GDP for the exporters leads to a 15 percent increase (static RE) and 12 percent (dynamic) in exports. Similarly an increase in the GDP of the importers by 10 percent leads to 13 percent in export trade under both static and dynamic RE models. It thus emerges as it is conventionally established that when countries increase their incomes they are likely to trade more.

Table 2: Trade Creation and Diversion Effects of the EAC Customs Union

Variable	RE Static	RE Dynamic
Exporter per capita income	0.209***	0.172***
	0.0132	0.0127
Importer per capita income	-0.0578***	-0.0734***
	0.0124	0.012
Exporter GDP	1.543***	1.221***
	0.0124	0.013
Importer GDP	1.269***	1.274***
	0.0109	0.0106
Distance	-0.811***	-0.788***
	0.023	0.0222
Area	0.0283**	0.0312***
	0.00889	0.0086
Contingency	0.987***	0.847***
	0.101	-0.0981
Common Official language	0.843***	0.876***
	0.0481	0.0466
Common Colony	-0.00526	-0.0324
	0.0582	0.0563
Landlocked	-0.0464	-0.0575
	0.048	0.0464
Island	0.656***	0.572***
	0.0524	0.0507
Dummy Intra-EAC	6.897***	7.018***
	0.28	0.27
Dummy Extra-EAC	0.534***	0.227**
	0.0745	0.0723
Dummy Customs Union	0.569***	0.384***
	0.0346	0.0336
Real Exchange Rate	-1.681***	-1.328***
	0.112	0.109
Lag of exports		0.213***
		0.00332
Constant	-42.08***	-38.84***
	0.654	0.635
R squared overall	0.527	0.557
R squared between	0.976	0.99
R squared within	0.522	0.552
Number of observations	60214	
Number of groups	11	11
Wald chi2(15)	67065.81	75753.27
Probability > chi2	0.0000	0.0000

Standard errors in parentheses: * p<0.05, ** p<0.01, *** p<0.00

The distance to the importers capital city is highly significant and negative conforming to theory that distance is associated with transport and distribution costs in international trade. As distance in kilometres increases by 10 percent, trade reduces by 8 percent in all the models. The EAC region exports commodities to the European Union and other far areas which increases transaction costs. Although the size of the country is highly significant, the coefficient is quite small with probably a small impact. As the sizes of different country differ by a margin of 10 percent, trade marginally increases by less than 1 percent. It is not all about the size of the country but the size of the economy (GDP) that matters most. For that matter small countries with advanced technology in manufacturing, trade more than large countries relying on commodities for exports.

It is argued that trade agreements and relations respond with time suggesting that exports in the previous year impact on exports in the current year. As expected the lagged exports added to the list of predictor variables (dynamic model) is statistically significant (less than 1 percent), moreover with the expected positive signs. This suggests that lagged exports exert a positive and highly significant impact on current export flows. Increase in trade in the previous increases trade in the current period by 2 percent and this is agreement with growth in intra-EAC trade discussed in the background of this paper. In the context of the analysis, the EAC trade agreement signed by partner states is taking effect by generating more trade. This is further underlined by the variable that estimates the impact of the EAC CU. The variable breaks the analysis in two periods: where 2001 to 2004 is taken as the first phase -FTA and 2005 to 2010 is taken as the second phase –CU. The coefficient value of 0.569[15] (static RE) and 0.384 (dynamic RE) translate into 77 and 46 percent increase in trade respectively. Implementation of the EAC CU has thus increased intra-EAC export trade.

The results suggest that movements in the real exchange rate affect trade flows as the estimated coefficient is negative and highly significant. A 10 percent appreciation in the real exchange rate of the exporter country reduces exports by 17 percent (static RE) and 13 percent (dynamic RE). This implies that depreciation (devaluation) of the exporter country likewise increase exports by similar magnitudes.

Trading with a neighbour with a similar border increases chances of trade significantly. The coefficient value of 0.987[16] (static RE) and 0.847 (dynamic RE) translate into 168 and 133 percent increase in trade respectively. The EAC is bordered by seven countries and regional trade is not only increasing among the partner states but also its non-member neighbours. The dummies of common colony and land locked are insignificant in all the models estimates. However islands owing to their proximity and access to trade routes and facilities increase the amount to trade between partner states. Being an island increases trade by 93 percent (static RE) and 77 percent (dynamic RE). Concerning the official language, results suggest that having the same official language among a

15 The model is estimated in natural logs therefore all dummy variables are given a value of one in natural logs when the correspondent condition is satisfied and a value of zero otherwise. To obtain the percentage change the coefficients are computed as follows: [(EXP (0.598)-1)*100} and [(EXP (0.384)-1)*100}.

16 To obtain the percentage change the coefficients are computed as follows: [(EXP(0.987)-1)*100}

pair of trading partner increases trade by 140 percent (static RE) and 132 percent (dynamic RE). The overall picture suggested by the dummies is that exports are likely to reduce with distance, increase with proximity, reduce with poor access and increase with ability to communicate.

The variables of interest in the estimation with regard to the study objective are the dummy variables representing the Intra-EAC and Extra-EAC trade as earlier defined. The empirical question is whether the EAC regional integration is creating or diverting trade. Results reveal that the EAC regional integration is creating trade. The coefficients for the variable Intra-EAC is positive and highly significant. It shows that intra-EAC trade has significantly increased over time. Furthermore, the variable Extra-EAC is positive and significant showing that EAC partner states trading with non-partners increases trade by 68 percent (static RE) and 25 percent (dynamic RE). In other words under the EAC agreement trade creation effects far out way the trade diversion effects. With regard to the research question, it is evident that regional integration is helping to increase intra-regional trade. The measures undertaken to promote trade like reduction of internal tariffs, reduction of non-tariff barriers and adoption of a common external tariff have yielded positive results. The variable estimating the impact of the EAC CU further explains and gives evidence to that effect.

The results from this paper are partly in agreement with the findings by Buigut (2012). However, while the author detailed the individual EAC country trade (imports and exports) dynamics, this paper emphasizes the EAC bloc's trade creation and diversion dynamics especially with respect to the rest of the world. The paper departs from the pessimism about trade diversion expressed by World Bank (2000a); Yeats (1998); Schiff (1997); and Park (1995) since evidently the EAC has created more trade than diverted it. The results are in total agreement with De Melo*et al.,* (1993) and De Rosa (1998) who argue that integration both creates and diverts trade. Furthermore to prevent trade diversion, the EAC member countries should reduce trade barriers with non-member countries as they do for members. This paper did not examine the sectorial level trade creation and diversion as suggested by Panagariya (1998). What is important is that the ultimate effect of trade diversion and creation is summation of the sectoral effects. This paper provides evidence that is in agreement with the findings of Cernat (2001) asserting that contrary to the feared negative impacts of integration in South-South RTAs, they are not more trade diverting than other RTAs. Therefore this work complements previous works by demonstrating the trade creation and diversion elements.

4.4 Results in the perspective of EAC integration progress

There has been considerable effort to implement the different provisions of the EAC Treaty. This has been done through the EAC's various medium-term development strategies. The first Development Strategy of 1997-2000 focused on re-launching the EAC. This was followed by the second one of 2001-2005 that focussed on enhancing the development of the EAC Customs Union. The third one of 2006-2010 focused on the establishment of the EAC shared Common Market. Finally, the

fourth and current one of 2011 to 2016 is to ensure the implementation of the EAC Common Market and establishment of the EAC Monetary Union. All these strategies contain ingredients that emphasise increasing intra-EAC regional trade.

The EAC partner states initiated a programme to eliminate internal tariffs in 2005 and this was achieved by January 2010. In order to account for differences in the size and structure of their economies, EAC members adopted an asymmetrical tariff reduction approach with a transition period of five years. Under this arrangement, all of Kenya's imports from Tanzania and Uganda attracted zero tariffs, while exports from Kenya to Tanzania and Uganda were categorized into two lists. Category A goods benefited from duty-free status within the community, while category B products (880 importable goods from Kenya to Tanzania and 443 from Kenya to Uganda) were subject to duties until 2010 (WTO, 2012). The principle of asymmetry aimed at strengthening the capacities of Uganda and Tanzania to export, although the outcome is an empirical question. There are no longer any internal tariffs on intra-EAC trade and this successful implementation of the programme partly explains the growth in intra-EAC regional trade and therefore trade creation.

However, there have been serious impediments to the full and smooth implementation of the EAC CU. Over 35 NTBs have been identified by the EAC Secretariat and these remain a major problem to trade and business development in the EAC (Kirk, 2010). Specifically, NTBs affecting intra-EAC trade include non-harmonized technical regulations, sanitary and phytosanitary measures, customs procedures and documentation, and police road blocks (Okumu and Nyakori, 2010). The EAC Customs Protocol compels partner states to agree to eliminate remaining NTBs and refrain from imposing new ones, however, this has yielded limited success. The EAC partner states established NTB National Monitoring Committees (NMCs[17]) to monitor progress on their elimination. The outcome has been rather not promising and little progress in tackling NTBs has been made. NTBs still pose one of the greatest challenges to increasing trade in the EAC region. There is therefore room to further expand intra-EAC trade when NTBs are considerably reduced or altogether eliminated.

Although a number of legal documents have been adopted at the EAC level to fully harmonize partner states' trade policies against non-partner states, challenges do still exist. The RTA multiple memberships phenomenon by individual EAC countries impedes full harmonization of policies. Consequently, this complicates trade-related procedures in the region and ultimately impends trade. The existence of divergent trade policies and the non-uniform application of regional instruments by EAC partner states hinder trade led development. The need for uniform and consistently applied policies that are predictable becomes imperative to generate investments and trade.

The EAC Customs Union Protocol provides for standardisation of customs formalities and harmonization of documentation and procedures by member states (WTO, 2012). The practice shows that these have not been fully harmonized. The EAC countries have contin-

17 NMCs reports to the EAC Sectoral Committee on Trade, Industry and Investment, which is responsible for resolving outstanding NTBs.

ued to use different customs systems where Burundi, Rwanda, Tanzania, and Uganda use ASYCUDA while Kenya uses SIMBA 2005. This has created some difficulties in attaining a smooth exchange of information. The solution to this has been the creation of an interface of the two systems to operate under the Revenue Authorities Digital Data Exchange (RADDEx). However, owing to capacity limitations and resistance to change, RADDEx has been partially implemented only at some customs posts. The lack of standard customs formalities slow down the pace of business and thus discourage cross border trade.

The Protocol that establishes the EAC CU makes pertinent provision for export promotion schemes, special economic zones and exemption regimes in the region. In practice as pointed out (Kirk, 2010), these schemes are still rudimentary and applied differently by individual EAC partner states: Whereas Burundi investment incentives include: duty free and remission schemes; Kenya has a duty remission facility; manufacture under bond; and an export processing zone programme. On the other hand, Rwanda has the customs, VAT and income tax laws and is in the process of establishing an export processing zone. Tanzania has a duty draw-back scheme; export credit guarantee scheme; various exemptions and export incentives introduced by the Board of External Trade; and an export processing zone. Uganda's investment incentives include an export credit guarantee scheme; foreign exchange liberalisation that entitles exporters to retain 100 percent of their foreign exchange earnings; duty and VAT exemptions on exports; duty draw back; and manufacturing under bond. These provisions target increasing particularly export trade and they are extremely useful although they have not been harmonised.

5.0 CONCLUSION

The paper investigated the potential impact of South to South Regional grouping on trade creation and diversion. We used an expanded (augmented) gravity model to estimate the impact of the EAC treaty implementation on trade among partner state and non-partner states. Panel gravity models for trade are conventionally estimated using bilateral trade flows that generate results that are prone to three the errors explained Baldwin and Tagloni (2006). The paper instead adopted export data to overcome this problem. Using export data from 2001 to 2011 on 70 countries that trade mainly with the EAC partner states, the study establishes that the EAC region has indeed created trade contrary to widely held views that South-South RTAs largely divert trade. There is thus evidence that the EAC, a south-south RTA has been a more trade creating than a trade diverting as espoused in the literature. The rest of the gravity model variables conform to theory and are significant.

The paper further explains the possible measures that have helped generate the trade underscored: There has been effort to implement the provisions of the treaty and protocols through development strategies. These have emphasised among others removing barriers to trade and enhancing the environment to produce and export. The EAC partner states have significantly reduced and eliminated internal tariff barriers and set CETs to boost trade. In spite of such success there are glaring challenges which if adequately addressed would further increase both intra and extra EAC trade. The region is struggling in a number of areas which are potential areas for improving and increasing regional trade. There is limited success with regard to NTB which remain an impendent to trade in the region. The customs formalities have not been fully standardised and procedures have not been harmonised. Although export promotion schemes are provided for in the protocol, they are implemented in different shades lacking a common approach. There is lack of a common policy with regard to partner states' trade policies to non-partner states which complicates trade related procedures.

In light of the above results and in an effort for the EAC partner states to formulate and implement policy intervention to deepen regional trade the following policy areas emerge:

(i) The region should use the identified NTBs to implement regulatory reforms and reduce trade restrictive measures. This will require legally binding mechanisms with sanctions for non-compliance and should be stronger than the existing NMCs;
(ii) The EAC partner states should fully harmonise individual members trade policies applied to non-partner states; and
(iii) The EAC should expedite the process of standardization of customs formalities and harmonise the documentation and procedures of member states.

REFERENCES

Anderson, J E (1979),'A Theoretical Foundation for the Gravity Equation', *American Economic Review*, 69(1): 106-116.

Baldwin, R. and Taglioni, D. (2006), "Gravity for dummies and dummies for gravity equations",National Bureau of Economic Research Working Paper 12516, NBER.

Baldwin, Richard E. and Anthony J. Venables (1995). "Regional Economic Integration," in Gene

Grossman and Kenneth Rogoff (eds.), *Handbook of International Economics, Vol. III*,Elsevier, Amsterdam.

Bergstrand, J H (1990),'TheHeckscher-Ohlin-Samuelson Model, the Linder Hypothesis and the Determinants of Bilateral Intra-Industry Trade', *Economic Journal, December 1990*, 100(403): 1216-29.

Bhagwati J. and ArvindPanagariya (1996). *The Economics of Preferential Trade Agreements,* Washington, D.C.: AEI Press.

Brown, Drusilla K. (1993). "The Impact of a North American Free Trade Area: Applied General Equilibrium Models," in Nora Lusting, Barry P. Bosworth, and Robert Z. Lawrence,(eds.) *Assessing the Impact, North American Free Trade,* Washington, D.C.: The Brookings Institution.

Buigut S (2012),'An Assessment of Trade Effects of the EAC African Community Customs Union on Member Countries', *International Journal of Economics and Finance*; 4(10)

Cernat Lucian (2006) Assessing Regional Trade Arrangements: Are South–South RTAS More Trade Diverting? Division on International Trade in Goods and Services, and Commodities, UNCTADGeneva, Switzerland

Deardorff, A. V. (1998),'Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?', in J. A. Frankel, ed., The regionalization of the world economy. Chicago: *University of Chicago Press*: 7-22.

De Melo, Jaime, ArvindPanagariya and DaniRodrik (1993). "The New Regionalism: A Country Perspective," in De Melo, Jaime and ArvindPanagariya (eds.), *New Dimensions in Regional Integration.* Cambridge: Cambridge University Press.

De Melo, Jaime and ArvindPanagariya (1993). *New Dimensions in Regional Integration. Cambridge*: Cambridge University Press

DeRosa, Dean A. (1998). "Regional Integration Arrangements: Static Economic Theory, Quantitative Findings, and Policy Guidelines," background paper for a World Bank Policy Research Report, *Regionalism and Development.*

Elbadawi, I. (1997). "The Impact of Regional Trade and Monetary Schemes on Intra-Sub-Saharan Africa Trade", in Ademola, O., I. Elbadawi and P. Collier, eds., *Regional Integration andTrade Liberalisation in Sub-saharan Africa*, Macmillan, Houndmills, Basingstoke, London.

Evans, D. (1998). *Options for Regional Integration in Southern Africa,* IDS Working Paper 94, Sussex: Institute of Development Studies

Feenstra, R., J.A. Markusen and A. Rose (1998). Understanding the Home Market Effect

and the Gravity Equation: The Role of Differentiating Goods, NBER Working Paper No.W6804. New York: National Bureau of Economic Research.

Finger, J. M. and M. E. Kreinin (1979). "A Measure of `Export Similarity' and Its Possible Uses" *The Economic Journal,* Vol. 89(356): 905-912

ForoutanFaezeh and Lant Pritchett (1993) Intra-Sub-Saharan African Trade: Is it Too Little: JAE Oxford Journals

Francois. I.F., and C.R. Shiells eds. (1994) Modelling Trade Policy: Applied General Equilibrium Assessment of North America Free Trade. Cambridge: Cambridge University Press

Frankel, Jeffrey and E. Stein, and S. Wei (1995). "Trading Blocs and the Americas: The Natural, the Unnatural and the Super-Natural," *Journal of Development Economics*, Vol. 47, pp. 61-95.

Gehlhar, Mark J. (1998). "Multilateral and Regional Trade Reforms: A Global Assessment from aU.S. Perspective," in Mary E. Burfisher, and Elizabeth A. Jones, eds. *Regional Trade* 19 *Agreements and U.S. Agriculture*, Economic Research Service, AER No. 771.

Washington, DC: U.S. Department of Agriculture.

Harris, M.N and Matyas, L. (1996), A Comparative Analysis of Different Estimates for Dynamic Panel Data Models, Dept of Econometrics, Monash University, Working Paper no. 4/96.

KandoganYener (2005) Trade Creation and Diversion Effects of Europe's Regional Liberalization Agreements, The University of Michigan Business School, William Davidson Institute Working paper 746

Kirk, R. (2010), *Addressing Trade Restrictive Non-Tariff Measures on Goods Trade in the East African Community*

Krugman Paul (1993). "Regionalism versus Multilateralism: Analytical Notes," in De Melo, Jaime

Mukiibi Julian (2010), Policy Challenges and Opportunities: The Case for Trade in the Resurgent EAC, CUTS Geneva Resource Centre

Laaser, C.-F., and K. Schrader (2006),' Baltic Trade with Europe: Back to the Roots Baltic', *Journal of Economics*, issue; 5(2): 15-37, 0n www.ceel.com

Levin, A, C.F Lin and C. Chu (2002), 'Unit Roots Tests in Panel Data: Asymptotic and Finite Sample Properties', *Journal of Econometrics*, 108: 1-24.

Linneman, H. (1966). An Econometric Study of International Trade Flows. Amsterdam, North Holland.

Matyas L. and L. Konya (2000), Modelling Export Activity of Eleven APEC Countries, Melbourne Institute Working Paper No.5/00,The University Melbourne.

McIntyre, M. (2005) Trade Integration in EAC: An Assessment for Kenya, IMF Working Paper No. 5 (143) Washington DC

Okumu Luke and Okuku J.,C. Nyakori (2010) Non-Tariff Barriers in EAC Customs Union: Implications f or Trade Between Uganda and Other EAC Countries

Park, J. H. (1995), 'The New Regionalism and Third World Development', *Journal of Developing Societies,* XI (1): 21-35.

Panagariya, Arvind (1998). "The Regionalism Debate: An Overview," Centre for International Economics, Department of Economics, University of Maryland at College Park, Working paper No. 40.

Panagariya, Arvind (1996). "The Free Trade

Area of the Americas: Good for Latin America?" *The World Economy*, Vol. 19, no 5. pp. 485 - 516.

Pöyhönen, P (1963),' A Tentative Model for the Volume of Trade Between Countries', *Weltwirtschaftliches Archive*, 90: 93-99.

Robinson, Sherman, Mary E. Burfisher, Raul Hinojosa-Ojeda, and Karen Thierfelder (1993). "Agricultural Policies and Migration in a U.S.-Mexico Free Trade Area: A Computable General Equilibrium Analysis," *Journal of Policy Modeling*, Vol 15 nos. 5&6, pp. 673-

Schiff, M., (1997), Small is Beautiful: Preferential Trade Agreements and the Impact of Country size, Market Share, Efficiency, and Trade Policy. Policy Research Working Paper 1668. International Trade Division, the World Bank. Washington, D.C.

Shinyekwa I. and J. Mawejje (2013) Sectoral Effects of the EAC Regional Integration, A Recursive CGE Analysis. EPRC Research Series Kampala Uganda.

Studenmund, A.H. (2001),*Using Econometrics – A Practical Guide*. San Franciso, CA: Addision Wesley Longman

Tinbergen, J. (1962), *Shaping the World Economy: Suggestions for an International Economic Policy,* New York: The Twentieth Century Fund.

UNTACT and WTO (2012), *A Practical Guide to Trade Policy Analysis*

Viner, Jacob (1950). *The Customs Union Issue*. Carnegie Endowment for International Peace, New York.

Winters, L. Alan (1996). Regionalism versus Multilateralism. Policy Research Working Paper 1687, World Bank, Washington D.C.

World Bank (2000a). *Trade Blocs,* New York: Oxford University Press.

World Bank (2000b). *World Development Indicators* (on CD-ROM), Washington: World Bank.

World Trade Organization (2012) Trade Policy Review Report: The Secretariat East African Community

Yeats, Alexander J. (1998). "Does Mercosur's Trade Performance Raise Concerns about the Effects of Regional Trade Arrangements?" *The World Bank Economic Review,* Vol. 12, no.1, pp. 1 - 28.

Zarzoso M.I and F. Nowak-Lehmann (2003), 'Augmented Gravity Model: An Empirical Application to Mercosur-European Union Trade Flows', *Journal of Applied Economics*, 6(2): 291-316.

APPENDIX A1

Table A1:Total intra-EAC trade, 2005-2011 (US$ million)

	2005	2006	2007	2008	2009	2010	2011
Imports							
Burundi	..	61.2	79.6	84.9	86.8	89.2	267.1
Kenya	59.5	76.7	188.0	181.0	162.5	256.8	302.9
Rwanda	139.8	139.8	201.9	303.3	363.5	344.6	589.3
Tanzania	175.9	220.6	110.1	425.3	316.9	295.9	378.0
Uganda	550.8	429.7	526.5	566.8	547.0	576.5	721.0
	926.0	**928.0**	**1,106.1**	**1,561.3**	**1,476.7**	**1,563.0**	**2,258.3**
Exports							
Burundi		27.0	15.4	10.7	14.2	16.0	24.1
Kenya	831.2	641.0	830.4	1,036.6	1,169.5	1,280.0	1,544.4
Rwanda	..	36.6	45.1	43.4	93.2	50.4	70.8
Tanzania	142.0	147.4	169.4	310.5	285.0	462.7	416.8
Uganda	87.9	101.8	148.8	195.2	398.8	428.6	649.7
	1,061.1	**953.8**	**1,209.1**	**1,596.4**	**1,960.7**	**2,237.7**	**2,705.8**
Total EAC trade value							
Burundi	..	88.2	95.0	95.6	101.0	105.2	291.2
Kenya	890.7	717.7	1,018.4	1,217.6	1,332.0	1,536.8	1,847.3
Rwanda	..	176.4	247.0	46.7	456.6	395.0	660.1
Tanzania	317.9	368.0	279.5	735.8	601.9	758.6	794.8
Uganda	638.7	531.4	675.3	762.0	945.7	1,005.1	1,370.7
	1,847.3	**1,881.7**	**2,315.2**	**2,857.7**	**3,437.2**	**3,800.7**	**4,964.1**

Data Source: East African Community Facts and Figures - 2012. ARUSHA, TANZANIA. EAC Secretariat, 2012

APPENDIX A2

Table A2: The countries that are included in the study

Argentina	Hungary	Portugal
Australia	India	Qatar
Austria	Indonesia	Republic of Korea
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