COMESA

Key Issues

in Regional Integration. Vol 6

KEY ISSUES IN REGIONAL INTEGRATION VI

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ACRONYMS AND ABBREVIATIONS

ADF	Augmented Dickey Fuller
AEO	Authorized Economic Operator
AIMS	African Integrated Maritime Strategy
ASEAN	The Association of Southeast Asian Nations
AU	African Union
CB	Common Border
CBSEP	Customs Business Systems Enhancement Project
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
CFTA	Continental Free Trade Area
CGP	COMESA Green Pass
CIF	Cost Insurance Freight
CL	Common Language
COMESA	Common Market for Eastern and Southern Africa
COMSTAT	COMESA Statistics
COMTRADE	United Nations International Trade Statistics Database
CPI	Corruption Perception Index
DD	Difference in Difference
DFTA	Digital Free Trade Area
DWT	Deadweight Tonnage

EAC	East African Community
ECA	Economic Commission for Africa
ECCAS	Economic Community of Central African States
ECM	Error Correction Model
ECOWAS	Economic Community of West African States
ECTS	Electronic Cargo Tracking System
ERV	Exchange Rate Variability
EU	European Union
FDI	Foreign Direct Investment
FE	Fixed Effect
FEM	Fixed Effects Model
FTA	Free Trade Area
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HS	Harmonized System of Tariff Classification
IACS	International Association of Classification Societies
ICT	Information and Communication Technology
IFS	International Financial Statistics
IMO	International Maritime Organization
IMP	Internal Market Programme
IPS	ImPesaranShin
ITU	International Telecommunication Union
LM	Lagrange Multiplier
MENA	Middle East and North Africa
MFN	Most Favoured Nation
MNCs	Multi National Corporations
MRA	Malawi Revenue Authority
MVA	Manufacturing Value Added
NIC	National Insurance Company
NMCs	National Monitoring Committees
NSO	National Statistical Office
NTMs	NonTariff Barriers
NTMs	NonTariff Measures
NVOCC	NonVessel Owning Common Carrier
OECD	Organization for Economic Cooperation and Development
OLI	Ownership Location and Internalization
OLS	Ordinary Least Squares

ONA	One Network Area
PIC	Primary Insurance Company
PMGE	Pooled Mean Group Estimation
PPML	Poisson Pseudo Maximum Likelihood
PSM	Propensity Score Matching
R&D	Research and Development
RCA	Revealed Comparative Advantage
RE	Radom Effect
RECs	Regional Economic Communities
REM	Random Effects Model
RESET	Ramsey Regression Equation Specification Error Test
RI	Regional Integration
RIA	Regional Integration Arrangements
RMs	Regional Mechanisms
SADC	Southern African Development Community
SI	Statutory Instrument
SMS	Short Messaging Service
SPC	Special Purpose Company
SPS	Sanitary and phytosanitary
TBT	Technical Barriers to Trade
TCD	Time Cost Distance
TEUs	Twentyfoot Equivalent Units
TFA	Trade Facilitation Agreement
TFP	Total Factor Productivity
TI	Transparency International
TRAINS	UNCTAD Trade Analysis Information System
TRALAC	Trade Law Centre
TRS	Time Release Survey
UK	United Kingdom
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
URA	Uganda Revenue Authority
USD	United States Dollar
VDP	Value for Duty Purposes
WAEMU	West African Economic and Monetary Union
WCO	World Customs Organization

WDI	World Development Indicators
WGI	Worldwide Governance Indicators
WITS	World Integrated Trade Solution
WTA	World Trade Agreement
WTO	World Trade Organisation

PREFACE

Key Issues in Regional Integration is an annual publication of COMESA Secretariat. This edition is motivated by the long-standing desire to establish the continental free trade area through nurturing the linkage between industry, academia and policy makers in addressing regional integration concerns in the continent. The edition therefore provides a platform for disseminating research output on regional integration not only from COMESA secretariat, but also from these key constituencies.

This volume consists largely of empirical and a few policy research papers under the overall theme "*boosting intra-African trade through RECs: perspectives from COMESA regional integration programmes"*. The papers address themselves to a wide range of topical themes namely: The effects of regional economic communities on market integration and industrialization; Effect of regional integration on intra-COMESA foreign direct investment; Impact of border delays and costs on COMESA cross border trade: Audit of NTBs in the COMESA region; Potential for intra-COMESA processed food products trade: Institutional quality and trade; Revenue implications of continental free trade area; Telecommunication, intra-trade and economic growth with COMESA; and the COMESA shipping line.

The purpose of this edition is to educate the reader on the various integration milestones within Africa and how through regional integration the intra-African trade could be boosted. It stretches the scope of readership to cover researchers on international trade and regional integration and avails to the reader insightful dimension of issues at the frontier of integration debate in the COMESA region and African continent at large.

The journey of writing this edition commenced with presentation of research papers at the second COMESA-ACBF Research Forum held in Kigali, Rwanda in June 2017. Following a rigorous peer review process, select papers were presented at the plenary session of the Forum where they were discussed and subjected to further sit-in review and comments by participants. In the final round, a small band of papers were selected for publication on the basis of their relevance, conceptual and methodological robustness. This whole process was however, fraught with some problems. Some good papers were dropped for lack of relevant and up to date data and for inability of authors to complete revisions within scheduled timelines.

Majority of the empirical papers relied on secondary sources of data. A few, however, collected primary data through field surveys in different countries. The novelty in this edition however, is found in the empirical basis of analysis deployed and the participation of academia and industry at the Research Forum and peer review process.

Several institutions and people were instrumental in the process leading up to this publication and their involvement is gratefully acknowledged. The COMESA Secretariat under the leadership of The Secretary General Mr Sindiso Ngwenya, African Capacity Building Foundation, and the Division of Trade and Customs under the stewardship of Dr Francis Mangeni deserve special mention. The support of the editorial team (Benedict Musengele, Seth Gor, Mwangi Gakunga, Jane Kibiru, Rachael Kemigisha and Kennedy Osoro) is highly appreciated.

The Impact of Authorized Economic Operator Accreditation on Trade Facilitation: the case of Uganda

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Abstract

This study examined the likely impact of Authorized Economic Operator (AEO) accreditation on trade facilitation, taking Uganda as a case study. The study assessed the impact of AEO accreditation status on the firms' clearance time of goods at customs, trade volume, and the customs revenue paid to government. The study used import and export (customs) data extracted from Uganda Revenue Authority Asycuda database and the analysis involved matched difference-in-differences regression.

The results show that firms in Uganda that voluntarily sought and achieved AEO accreditation from Uganda Revenue Authority (URA) experienced much reduced clearance time compared to peer firms that are not AEO accredited. The results further indicate that AEO accredited firms in Uganda were experiencing exponential growth in trade compared to peer firms that are not AEO accredited. Finally the results show that the quantum of tax paid to government by AEO accredited firms was significantly higher compared to non-AEO accredited firms.

Based on the results, we conclude that the AEO program in Uganda has led to significant reduction in clearance time and increased trade of accredited firms and government tax revenue.

The study recommends that the government of Uganda through URA should continue promoting and encouraging the international trade community in Uganda to take up AEO accreditation.

1.0 Introduction

Authorised Economic Operator (AEO) is a concept that originates from the World Customs Organization (WCO) 'SAFE' Framework of Standards, which were adopted in 2005 by the WCO Council member countries –including Uganda, (World Customs Organization [WCO], 2006). SAFE stands for Security and Facilitation in a global Environment. By March 2016, 69 countries including Uganda were implementing the AEO program and 16 other countries were due to join implementation (WCO, 2016).

The AEO is a party or entity involved in the international movement of goods in whatever function that has been approved by or on behalf of a national customs administration as complying to World Customs Organization (WCO) or equivalent supply chain standards (WCO, 2005).

Participation in the AEO program is voluntary and at the national level the international trade community (manufacturers, customs clearing agents, bonded warehouse operators, importers, exporters, transporters and freight forwarders) can only be granted AEO status if they meet the AEO eligibility criteria, which include among others sound management of commercial records, good financial standing, good cargo and personnel security, and good compliance history with customs and other government regulatory bodies (WCO, 2006).

Participants (international trade community) in the AEO program are said to be associated with a host of short term and long term trade facilitation benefits which are above and beyond the normal procedures provided to the non-AEO (WCO 2006). Short-term trade facilitation benefits include among others paperless processing of commercial shipments, remote customs clearance procedures, expedited cargo release, prioritization in cargo clearance during period of elevated threat conditions, priority response to requests for rulings from customs authorities. Long-term trade facilitation benefits on the other hand include reduced cost of doing business, enhanced internal controls, increased turnover, trustworthy and compliant business.

1.1 AEO Implementation in Uganda

Uganda Revenue Authority launched the AEO accreditation program in 2012. The program was one of the four components of the Customs Business Systems Enhancement Project (CBSEP) (Uganda Revenue Authority URA, 2016) that was implemented from July 2011 to June 2015. The other components of the CBSEP were: upgrade of customs web-based management system from Asycuda++ to Asycuda World, Electronic Cargo Tracking System (ECTS), and training of customs officials to implement the three project components. Besides donor financial support, the WCO provided technical support to URA in the implementation of the program including training and relevant technical materials such as the implementation guide, AEO templates, SAFE framework standards and model appeal procedures (URA, 2015).

The implementation of the program started with sensitization of individuals, business entities and government departments involved in international trade on the benefits of being an AEO and the requirements for accreditation. Some 28 firms involved in Uganda's international trade were accredited between 2012 and 2016. Ten (10) firms were granted AEO status in May 2013, 12 firms in 2014 and 6 in 2016 (Table 1A in Appendix).

The process of accreditation is voluntary, free, and takes a minimum of two months.[3] The

3 *Additional information on AEO accreditation process can be obtained at http://web.ura.go.ug/Pages/Guides%20*

process of AEO accreditation involves the following six steps; submission of a written expression of interest to URA Commissioner of Customs, preliminary consultation with customs AEO team, filling-in forms –with supporting documents (on sound management of commercial records, good financial standing and good compliance history with Customs and other government regulatory bodies), vetting of eligibility of the applicant, on-site inspection of applicant premises to confirm information provided in the application, and authorization/approval of the entity as AEO by Commissioner of Customs.

Accounts from firms that have been accredited suggest that the process of AEO accreditation in Uganda is cumbersome, laden with indirect costs that adversely affect small and medium scale businesses, and the process of accreditation takes not less than six months.[4] Conformity to security standards is considered the most costly eligibility criteria as it requires the firms premises to abide by the minimum business partnership management procedures, conveyance and container security, physical access controls, procedural security, information technology (IT) security, personnel security.

1.2 Problem statement

Delays in customs clearance of goods lead to significant costs to firms involved in international trade and loss of tax revenue to governments (Organisation for Economic Coorperation and Development OECD, 2005). There are over 400 firms involved in Uganda's international trade, however only 28 firms were AEO accredited by end of 2016 suggesting a low uptake of voluntary AEO accreditation by firms in Uganda. Despite the benefits of AEO there is low uptake of the AEO accreditation program in Uganda. The low uptake implies that the cost of customs clearance remains high and this impacts negatively on the government's tax revenue.

1.3 Objective of the study

The overall objective of the study was to assess the impact of AEO accreditation on trade facilitation in Uganda. The specific objectives of the study were to examine:

(i) The impact of AEO accreditation on clearance time as a measure of trade facilitation

(ii) The impact of AEO accreditation on firm's trade volume

(iii) The impact of AEO accreditation on firm's customs taxes paid

2.0 Review of Literature

According to article 7.7 of the WORLD Trade Agreement (WTO) Trade Facilitation Agreement (TFA)[5], eligible Authorised Operators are required to have in place trade facilitation measures that include: appropriate record of compliance with customs and related regulations, financial solvency including the provision of sufficient security such as guarantee bonds where necessary, supply chain security management systems, and IT system for safe keeping of data and documentation to allow for internal controls

for%20Importation%20of%20Goods%20to%20Uganda/Authorised%20Economic%20Operator.aspx

4 http://www.newvision.co.ug/new_vision/news/1312935/authorised-economic-operators-aeo

5 The TFA entered into force on 22 February 2017 and applies only to the WTO members that have accepted it. Details of the article 7 of the TFA is available at https://www.wto.org/english/docs_e/legal_e/tfa-nov14_e.htm#art7

(WCO, 2015).

Organization for Economic Cooperation and Development [OECD] (2005) and World Bank (2017) show that the cost of customs clearance is affected by delays in clearance of goods, this includes compliance costs relating to information requirements, and costs arising from procedural delays and lost business opportunities. The studies further indicates that border-related costs and expenses due to delays in clearance is estimated to range between 2% to 15 % of the total value of goods traded goods. On the other hand, inefficient border procedures cost governments in terms of lost revenue estimated to exceed 5% of gross domestic product in some African countries (OECD, 2013b).

Hummels and Schaur (2013) estimate the impact of time delays as a cost on the value of goods in transit. The results of their study indicate each day in transit is worth 0.6 to 2 percent of the value of the good, and that long transit delays significantly lower the likelihood of country exporting the good in question.

According to the Compendium of Authorized Economic Operator Programs, in 2014, a total of 26 countries were implementing AEO programs (WCO, 2014). That is 9 countries in Americas and Caribbean Region, one country (Jordan) in Middle East and Northern Africa Region, two countries (Uganda and Kenya) in East and Southern Africa Region, 9 countries in Asia Pacific Region, and 5 countries in Europe Region. However, by March 2016, 69 countries were implementing the AEO program and 16 countries were slated to join implementation (WCO, 2016).

The first group of countries to implement the AEO program on full-scale or pilot basis was Canada, Japan and the European Union (WCO, 2014). In East Africa, Kenya was the first country to implement the AEO program in 2010 followed by Uganda in 2012 and Burundi in 2013 (WCO, 2016).

The implementation of the AEO program around the world has been associated with mixed experiences and benefits. There are mixed perceptions with respect to the benefits of AEO accreditation compared to the time, effort and costs associated accreditation process. According to the WCO, to be certified as an AEO is an arduous task in which firms invest heavily, yet customs administrators often do not offer substantial benefits in the form of trade facilitation[6]. This is the reason WCO cites, for the somewhat worldwide slow uptake of AEO programs.

In Australia, after a 2-year implementation of its pilot AEO program, the Australian Customs and Border Protection Service commissioned a survey of industry attitudes toward an Australian Authorised Economic Operator (AEO) scheme in 2006/7 and later in 2009/10. The results of the surveys consistently showed that none of the industry executives surveyed considered that an Australian AEO scheme would offer net benefits (Baker, 2011). Instead, the executives believed that the scheme's costs would outweigh the benefits.

Djankov, Freund and Pham (2010) estimated the effect to time delays on the volume and value of exports in 126 countries (including Uganda) using the difference gravity equation –a variant of the gravity model. The results of their study indicated specifically that a one percent increase in export time in a landlocked country reduced trade by one percent; and generally that time delays on hurt trade.

6 *Details on this subject are at http://tfig.unece.org/contents/authorized-economic-operators.htm*

Fernandes, Hillberry and Alcántara (2015) used a two-stage least squares regression method to estimate the impact of reduction in physical inspection rates on customs clearance and volume of trade in Albania. The results of their study show that conditional reductions in physical inspection rates lead to significantly lower delays in customs for Albanian imports. Further, the results show that reduced delays in customs increased imports through increased number of firms involved in shipping and number of shipments.

Tegneman and Tryggvason (2015) conducted a qualitative survey among 10 executives of Swedish AEO certified firms to understand their perceptions regarding the costs and benefits of these firms being AEO accredited. The authors' report indicates that Swedish industry executives were generally satisfied with benefits that come with being AEO accredited. For example, it is reported that AEO certification provided the firms with some form of quality approval/stamp. That AEO certified firms were considered by trading patterns as safe and secure –which in turn increased the volume of trade. On the issue of costs, it is reported that the executives of AEO firms considered the effort and time expended in the accreditation process to be substantial compared financial outlay.

Improving trade facilitation through AEO accreditation mechanisms plays a critical role improving the income of accredited firms as well national revenue. According to Hoekman and Shepherd (2013) the national income effects of improved trade facilitation can be up to two or three times as great as those that would result from removing all tariffs on manufactured goods globally.

The foregoing literature highlights the mixed reviews of AEO benefits. To push the agenda of AEO accreditation forward, it is therefore critical that further reviews of the benefits of the AEO program are undertaken and shared.

3.0 Methodology

3.1 Theoretical model

This study used the matched difference-in-differences (matched DD) method to estimate the trade facilitation benefits that accrue to AEO accredited firms compared to peer non-AEO accredited firms in Uganda that are involved international trade. The matched DD method is a robust method that is highly recommended (Khandker, Koolwal & Samad, 2010; Gertler, Martinez, Premand, Rawlings & Vermeersch, 2011) and widely used (Bergemann, Fitzenberger & Speckesser, 2004; Cattaneo, Galiani, Gertler, Martinez & Titiunik,2009; Okoboi, Kuteesa & Barungi, 2013; Okoboi and Mawejje 2016) in non-experimental longitudinal (panel data) impact studies.

Matched DD method involves two steps. The first step involves use of the propensity score matching (PSM) data analysis technique to generate a comparison group of sample observations –that prior to implementation of a program, have similar characteristics as sample observations that is exposed to the program (treatment group). The second step in the matched DD method is the actual determination of the impact of a program –through the difference in difference (DD) regression analysis of matched data, on the group that was exposed to the program (treatment group) in comparison to the other group that was not exposed to the program. The advantage of the matched DD method is that the likely observable heterogeneity in the initial conditions is done away with to ensure that the comparison group is similar to the treatment group (Khandker et al., 2010).

The impact analysis approach assesses the double effect of with-without and before-after scenario of the intervention. The intervention in this case being AEO accreditation program. AEO accreditation program was launched in 2012. Therefore rolling out AEO accreditation program represents the treatment and in our case, the treatment group (with treatment) are firms enlisted in the AEO scheme and the comparison group (without treatment) are firms not enlisted in the scheme. The period before 2012 represents the before treatment scenario and 2012 onwards represents the after treatment scenario.

In order to identify the comparison group that have similar characteristics as the treatment group, the first step of our analysis involved using the propensity score algorithm to extract from our data, a batch of firms (comparison group) with similar baseline or pre-treatment characteristics as those enrolled in AEO (treatment group). The PSM algorithm as adapted from Rosenbaum and Rubin (1983) is presented in equation (1).

$$\mathrm{P(X) = Pr(T = 1|X) = E(t|X)} \quad (1)$$

Where is the propensity score, Pr is the probability, T = {0, 1} is an indicator of exposure to treatment (i.e. enrolment in AEO: T = 1 if firm accredited AEO, 0 otherwise, and X is a vector of background characteristics before exposure to treatment. E is the mathematical expectation symbol. Equation 1 states that the probability (Pr) of a firm participating in AEO, given its pretreatment background characteristics (X) is the conditional mean of the treatment (T).

Having obtained two groups of firms with similar characteristics except their status of enrolment in AEO, the second step of our analysis involved estimating a Ravallion (2008) DD regression equation (equation 2) to assess the beneficial trade facilitation, trade growth and customs revenue increase prospects associated with URA rollout of AEO accreditation program.

$$Y_{im} = \alpha + \phi T_{im} t_{im} + \beta T_{im} + \delta t_{im} + \varepsilon_{im} \quad (2)$$

Where, Y is the outcome variable, T is the variable representing exposure to treatment (i.e. whether or not firm enrolled in AEO), t is the time dummy variable representing the period before (t=0) enrolment and after (t=1) enrolment in AEO, and the coefficient of the interaction of T and t (Φ) is the estimate of the impact of treatment on outcome Y.

The subscripts *i* and *m* on the variables in equation (2) are panel data notations, where *t* stands for the number of individual observations (individual dimension) and *m* the number of time periods (time dimension). In this and as indicated in section (2.3), this study involved analysis of a panel data of 26,800 to 33,800 firms whose data had been collected over a period of 108 months (January 2008 to December 2016).

2.2 Empirical models

Based on the general formulation in equation (1) and available data, the specific PSM model estimated was a probit model stated in equation 3:

$$Pr(T_{im}) = \beta_0 + \beta_1 TV_{im} + \beta_2 tax_{im} + \varepsilon_{im} \quad (3)$$

Where, *Pr*(T) is the dependent variable – denoting the probability (Pr) of T; T is a dummy representing the treatment that is; the rollout of AEO accreditation program. Specifically *T=1* if the firm is AEO accredited and *T=0* if not AEO accredited; *TV* is the value of goods

declared at customs by the firm in a month and *tax* is total tax paid on goods declared. In this case, we assume that firms are similar based on their commercial characteristics – similar value of and tax on goods traded. is the error term representing any other factors not included in equation (3) but may have impact on the dependent variable. *i* is the panel data notation for number observations and *m* number of months.

For the DD regression model in equation 2, the specific models we estimated are presented in equation 4a to 4c. That is:

$$TF_{im} = \alpha_0 + \alpha_1 T_{im} * t_{im} + \alpha_2 T_{im} + \alpha_3 t_{im} + \omega_{im} \quad (4a)$$

$$TV_{im} = \phi_0 + \phi_1 T_{im} * t_{im} + \phi_2 T_{im} + \phi_3 t_{im} + \vartheta_{im} \quad (4b)$$

$$CT_{im} = \gamma_0 + \gamma_1 T_{im} * t_{im} + \gamma_2 T_{im} + \gamma_3 t_{im} + \mu_{im} \quad (4c)$$

Where, the dependent variable (*TF*) in Eq. (4a) measures trade facilitation and is represented by clearance time in days. That is the time taken by a firm to clear goods at any of the 37 customs collecting stations/borders out of which, 6 are OSBPS (One Stop Border Posts). The clearance time is determined from the time the firm lodges the tax assessment/clearance documents with URA to the time the goods exit URA customs jurisdiction.

T, as explained above is a dummy representing the treatment: *T=1* if the firm is AEO registered and *T=0* if not AEO registered;

t is a dummy representing the before and after implementation of the AEO accreditation program: *t=1* if year is January 2012 to December 2016 (the time after rollout of AEO accreditation program) and *t=0* if the year January 2008 to December 2011 (the time before rollout of AEO accreditation program).

*T*t* represents an interaction term between *T* (whether or not a firm is AEO) and *t* (period when or not firm operates as AEO)

ω, ϑ and μ are error terms representing any other factors not included in the respective specified equations above; $\alpha_0 \ldots \alpha_3$, $\phi_0 \ldots \phi_3$ *and* $\gamma_0 \ldots \gamma 3$, are parameters to be estimated; and i = 1, 2, . . . , n is number of observations from first to the last (n) and m = 1, 2, …., m is the time in months from January 2008 to December 2016.

The coefficients of the interaction term (that is α^1,ϕ_1 *and* γ_1) represent the estimate of the impact of the firm's accreditation as an AEO on trade facilitation, trade volume and customs revenue paid.

Equation (3) was estimated using the probit propensity score matching (PSM) model while Equations (4a) to (4c) were estimated using the bootstrapped ordinary least squares (OLS) regression.

2.3 Data and source

The study used import and export (customs) data for the period January 2008 to December 2016 (108 months). The data was generated from Uganda Revenue Authority (URA), Asycuda[7] databases. Over 10 million individual trade flow records were extracted from Asycuda databases, exported into STATA SE 14 for further management before

7 Asycuda is an acronym that stands for Automated System for Customs Data. The current version of that URA is using is Asycuda World. Before 2013, URA was using Asycuda++.

analysis. Data management involved conversion of string variables into numerical data (floats), conversion of daily records (aggregation or averaging) into monthly records. For example, clearance time variables that appear in customs database as non-numerical characters were de-stringed (converting into numerical variables); daily transaction records for each firm were collapsed into monthly records through aggregation of records by firm and by month; clearance time per transaction was converted into a monthly average for each firm.

After the data management processes, our final tally of observations ranged between 26,800 to 33,800 with about six key variables as indicated in Table 2A of summary statistics in the appendix.

4.0 Results and discussion

The DD regression results of the impact of AEO accreditation on firm's clearance time, trade volume and tax revenue paid by firms involved in Uganda's international trade is presented in Table 1. In the table, the impact of AEO accreditation on firm's clearance time is shown in Part A, trade volume in Part B, and tax revenue in Part C. Based on the Wald-chi statistics in all the panels that were statistically significant, it can be concluded that the overall model estimates were robust.

Estimated coefficients of the impact variable (interaction term) in all the equations (in all the panels) had the expected signs and were statistically significant at less than 1% level of significance. This clearly suggests that there are significantly higher trade facilitation benefits that accrue to firms on one hand and government on the other when firms involved in international trade are AEO accredited. However, to fully appreciate the quantitative impact of AEO accreditation program on trade facilitation, we used the fractional polynomial analysis (graphical) method to compare and contrast the trade facilitation outcomes of AEO and non-AEO accredited firms. This analysis and explanation is presented below.

Table 1: Impact of rollout ASYCUDA World and AEO Accreditation on trade facilitation, trade volume and customs taxes paid

	Dependent variables								
	Part A: Clearance time (days)			**Part B: Ln(trade value)**			**Part C: Ln(total tax paid)**		
Explanatory variable	Coef.	Bootstrap Std. Err.	Z	Coef.	Bootstrap Std. Err.	z	Coef.	Bootstrap Std. Err.	z
AEO	-5.10***	1.50	-3.4	0.15**	0.07	2.27	0.29***	0.11	2.73
Time	-17.61***	1.14	-15.4	0.83***	0.02	34.33	0.15***	0.03	4.7
AEO*Time	-11.67***	1.63	-7.15	0.79***	0.09	9.08	1.20***	0.11	10.5
Constant	22.91	1.15	20.01	7.33	0.02	436.04	19.74	0.02	803.47
Number of obs.	29,608			33,309			25,692		
Replications	50			50			50		
Wald chi^2 (3)	362.22***			2623.08***			1097.54***		
Prob > chi2	0			0			0		
R-squared	0.021			0.056			0.025		
Adj R-squared	0.021			0.056			0.025		

Note: **, *** implies statistically significant at 5% and 1% respectively

4.1 Impact of AEO Accreditation on Clearance Time

Figure 1 compares the average time taken by AEO accredited and non-AEO accredited firms to clear goods at URA customs through green and red channels. The results in Figure 1B, show that before introduction of the AEO accreditation program, firms that eventually became AEO accredited on average took more time (about 20 days) to clear goods compared to peer firms (18 days). However, after accreditation, the same firms took much lower time (about 3 days) to clear goods compared to 5 days clearance time for peer non-AEO accredited firms. This result suggests that firms that are AEO accredited enjoyed lower clearance time, which as suggested by the AEO implementation guideline (WCO, 2005) could be beneficial in increasing the flow of trade.

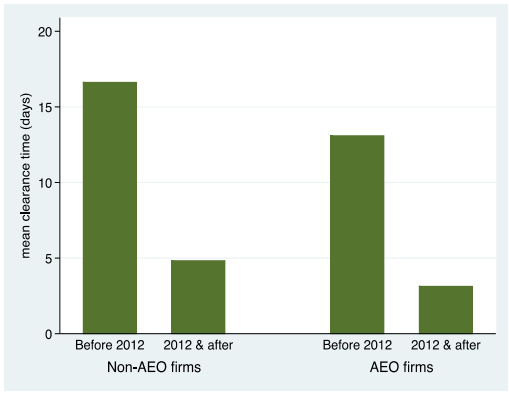

Fig 1A: Clearance time through Green channel

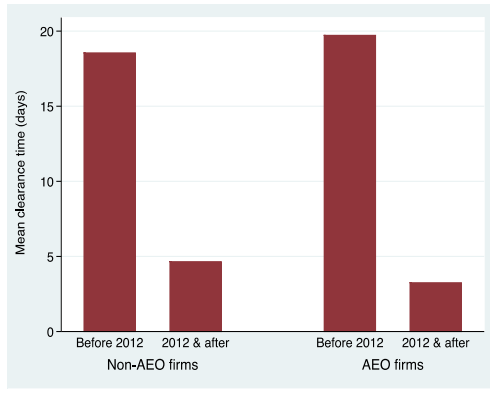

Fig 1B: Clearance time through Red channel

Figure 1: Impact of AEO accreditation on clearance time

4.2 Impact of AEO accreditation on firm's trade volume and tax paid

Figure 2A shows the trend (value) of customs bound goods of AEO accredited and non-AEO accredited firms and Figure 2B shows total tax paid on customs bound goods by AEO accredited and non-AEO accredited firms; before and after URA implementation of AEO accreditation program in 2012. The results suggest that before AEO program implementation, both AEO and non-AEO accredited firms had comparable monthly trade turnover and taxes paid with respect to customs bound goods. After URA rollout of AEO accreditation, however, firms that became AEO accredited were associated with increasingly higher monthly trade volumes (turnover) and taxes paid on customs bound goods compared to non-AEO accredited firms.

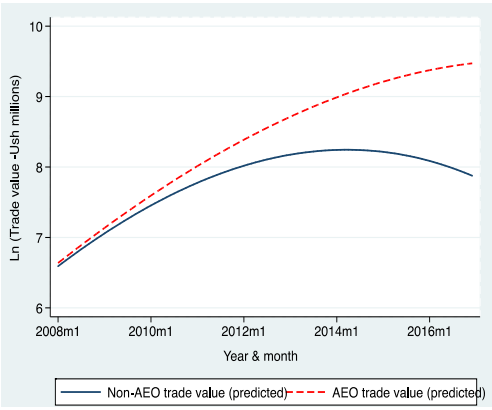

Fig. 2A: AEO accreditation on firm's trade volume

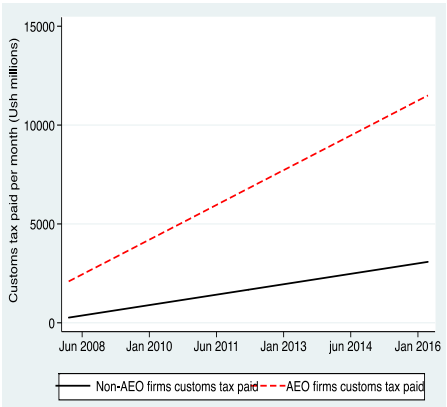

Fig. 2B: AEO accreditation on firm's taxes paid

Figure 2: Impact of AEO accreditation on firm's trade volume and taxes paid

5.0 Conclusion and Policy Implications

The results of this study show that firms that voluntarily sought and achieved AEO accreditation from URA are reaping benefits that come with expedited cargo release and exponential growth in trade volumes that they have registered compared to peer firms that are not AEO accredited. Besides, the results show that the quantum of tax paid to government by AEO accredited firms was significantly higher compared to peer firms that are not AEO accredited.

In conclusion we find that the AEO accreditation program in Uganda has been a success. The study recommends that the government of Uganda through URA should continue promoting and encouraging the international trade community in Uganda to take up AEO accreditation.

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APPENDIX

Table 1A: List of AEO Accredited Firms

S/No.	**Company Name**	**Date of accreditation**
1	British America Tobacco	9th May 2013
2	Nice House of Plastics	9th May 2013
3	Uganda Batteries Limited	9th May 2013
4	Jesa Farm Diary	9th May 2013
5	Roofings Uganda Limited	9th May 2013
6	DHL Global Forwarders	9th May 2013
7	Unifreight Cargo Handling	9th May 2013
8	Steel and Tube Industries Limited	9th May 2013
9	Toyota Uganda Limited	9th May 2013
10	Bollore Africa Logistics	9th May 2013
11	Spedag interfreight Uganda Ltd	22nd September 2014
12	General Machinery Ltd	22nd September 2014
13	Victoria Pumps Ltd	22nd September 2014
14	Victoria Motors Ltd	22nd September 2014
15	Victoria Engineering Ltd	22nd September 2014
16	Victoria Equipment Ltd	22nd September 2014
17	Rapid Kate Services Uganda Ltd	22nd September 2014
18	Multilines International Ltd	22nd September 2014
19	Daks Couriers Ltd	22nd September 2014
20	Union Logistics Uganda Ltd	22nd September 2014
21	Bemuga Forwarders Ltd	22nd September 2014
22	DHL International Ltd	22nd September 2014
23	Huawei Technologies Uganda Company Limited	15th April 2016
24	Umeme Ltd	15th April 2016
25	ThreeWays Shipping Services Limited	15th April 2016
26	Kenfreight Uganda Limited	15th April 2016
27	Mitchell Cotts Uganda Limited	15th April 2016
28	Roofings Rollings Mills Limited	15th April 2016

Table 2A: Summary Statistics of Data Used In Analysis

Variable	Unit of measure / description	Obs	Mean	Std. Dev.	Min	Max
AEO (T)	T=1 if firm AEO and T= 0 if firm non-AEO	33,811	0.074	0.261	0	1
Trade facilitation (TF)	Clearance time in days	29,608	11.561	62.842	0.00	1855.46
Time (t)	t=1 if year Jan 2012 -Dec 2016 and t= 0 if year Jan 2008 -Dec 2011	33,811	0.603	0.489	0	1
Channel	Green=1, blue=2, yellow=3, red=4	27,602	3.21	1.09	1.00	4.00
av_val_usd	Uganda shillings, millions	33,198	0.74	7.98	0.00	826.00
av_tot_tax	Uganda shillings, millions	26,844	13.20	62.30	0.00	6180.00
Trade volume (TV)	Uganda shillings, millions	33,582	10700.00	69900.00	0.00	6790000.00
val_usd	Uganda shillings, millions	33,582	213.00	1370.00	0.00	146000.00
Total tax paid (TR)	Uganda shillings, millions	33,582	2150.00	12300.00	0.00	716000.00

The COMESA Shipping Line:
A Seven-Step Roadmap

by Donald Tinotenda Charumbira

Abstract

The paper used comparative data to distil the COMESA and African stake in terms of the beneficial ownership of vessels in the world shipping fleet, container traffic handled, shipping costs and human capacity development in the maritime sector. The study found that the COMESA region, and Africa in general, held a very low stake in the global shipping industry, while the cost of importing and exporting containers into most parts of the COMESA region and Africa were significantly higher than in other parts of the world. The paper recommends a Seven-Step Roadmap to operationalize the COMESA Shipping Line as an intervention that could yield the benefits of lower shipping costs, enhanced international trade competitiveness and deeper regional integration through cargo consolidation and the synchronization of value addition and transport logistics.

1.0 Introduction

The idea of establishing a COMESA Shipping Line was first mooted by a six-nation working group in 1998 (Sunguh, 1998), while a feasibility study phase was commissioned in 2006 (COMESA, 2013). The COMESA Council of Ministers, at their 36th Meeting, held in Antananarivo, Madagascar, in October 2016, made a decision that the COMESA Shipping Line should be operationalized (COMESA, 2016a). Meanwhile, the 19th Summit of the COMESA Authority of Heads of State and Government, emphasized the importance of improving the maritime connectivity between the island and mainland COMESA Member States in the Indian Ocean region (COMESA, 2016b). The COMESA Heads of State and Government also welcomed the prioritization of the Ocean/Blue economy in the regional group's 2016 - 2020 work programme.

The operationalization of the COMESA Shipping Line is anticipated to enhance the international trade competitiveness of the COMESA region and the broader African Continental Free Trade Area by providing a cost-efficient logistics mechanism to convey African exports and imports. The initiative would further boost intra-African trade through interlinkages between the shipping mechanisms of African Regional Economic Communities (RECs) and Regional Mechanisms (RMs), enabling cargo consolidation and synchronised value-addition and transport arrangements.

In the pursuit of continental economic development, the enhancement of merchant sea power will be an essential catalyst of Africa's upward economic growth trajectory. History provides that no world power has been able to establish itself without first developing its sea power (Gray, 1992). Studies have found that, in ancient times, Africa was an eminent maritime region, with a vibrant boatbuilding industry and trading expeditions reaching deep into Asia and the America (Ward, 2000, 2012; Joseph, 2003; and Baxter, 2000). The ancient and pre-colonial African historical context, viewed in the prism of emerging 21st century African maritime domain awareness, provides a firm backdrop for an African maritime renaissance.

The COMESA region uniquely connects the Mediterranean Sea to the Indian Ocean, while also having an Atlantic Ocean gateway through the Democratic Republic of the Congo (DRC). The COMESA Shipping Line would thus feed into an extensive logistics network stretching from the northern ports of Tripoli in Libya and Alexandria in Egypt, to the southern ports of the Beitbridge border post in Zimbabwe and the Lomahasha border post in Swaziland; east from Port Louis in Mauritius and west to the DRC's Atlantic Ocean ports; connecting centrally in the African Great Lakes, where Lake Victoria flows ultimately to the Mediterranean Sea through the River Nile. These vast geographical coordinates poise the COMESA region to establish itself as the backbone of African shipping and port logistics, and as a world trade hub.

1.1 The International Legal Regime Governing the Shipping Industry

There are five types of ships in the world merchant fleet (International Chamber of Shipping n.d.- a). Container ships generally convey manufactured goods, while bulk carriers transport raw materials. Crude oil and other petro-chemicals are shipped by tankers. In the fourth category are cruise ships, used for passenger transport, tourism and leisure activities. The fifth category of ships is that of specialist vessels, including vessels used for offshore oil activities, scientific research, salvage and ice-breaking.

The main international legal instrument governing seas and oceans is the 1982 United Nations (UN) Convention on the Law of the Sea (UNCLOS) (UN, n.d. - a), which requires every ship to have the nationality of a Flag State, under which it is registered. Article 94 of UNCLOS enunciates the duties of Flag States, including maintaining a register of ships and effectively exercising jurisdiction and control over the ships to ensure their adherence to both national and international laws.

Specifically, in relation to the shipping line industry, the 1974 UN Convention on a Code of Conduct for Liner Conferences, defines a national shipping line as "a vessel-operating carrier which has its head office of management and its effective control in that country and is recognised as such by an appropriate authority of that country or under the law of that country" (UN, n.d. - b). A Liner Conference is defined in the Convention as a group of two or more vessel operating carriers which provide international liner services under uniform conditions, including common freight rates.

The convention also recognises a shipping line joint venture between two or more countries. COMESA Member States currently subscribing to the Convention are Burundi, Egypt, Ethiopia, Kenya, Madagascar, Mauritius, Sudan and Zambia (UN, n.d.- c). As of 2002, some 150 Liner Conferences were operational worldwide, with membership drawn from 40 different shipping lines (OECD, 2002).

The overarching multilateral organization dealing with shipping affairs is the International Maritime Organization (IMO), a United Nations specialized agency responsible for the safety and security of shipping and the prevention of marine pollution by ships (IMO, n.d.- a). In the COMESA region, the Comoros, the DRC, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Seychelles, Uganda, Zambia and Zimbabwe are members of the IMO.

Key IMO international conventions include the 1974 International Convention for the Safety of Life at Sea (SOLAS), the 1973 International Convention for the Prevention of Pollution from Ships and the 1994 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (IMO, n.d. - b). The IMO SOLAS Convention includes the 2004 International Ship and Port Facility Security Code (IMO, n.d.-c).

To promote and advance their industry, ship-owners have formed associations at national, regional and international levels. The apex organisation, the International Chamber of Shipping, was established in 1921 and holds consultative status with the IMO. Its membership consists of ship-owners' associations, which represent over 80 percent of the world's merchant shipping tonnage (International Chamber of Shipping, n.d.- b). Another key organisation in the shipping sector is the World Shipping Council, established in 2000, which also enjoys consultative status with the IMO. The World Shipping Council represents the Liner Shipping industry, with its members constituting approximately 90 percent of the global liner vessel capacity (World Shipping Council, n.d.).

The quality of a shipping line may be measured by the performance of the flags under which its ships are registered. The ratings of flag performance are largely based on reports produced by port authorities, consolidated by regimes known as Memoranda of Understanding (MoU) on Port State Control. The Paris MoU covers European ports while the Tokyo MoU relates to Asian and Pacific ports. In Africa there is the Abuja MoU covering Western, Central and some Southern African ports, while the Indian Ocean MoU covers Eastern and Southern African ports and the Mediterranean MoU covers North

Africa. The MoU regimes conduct vessel inspections related to international shipping standards, in some cases detaining ships for non-compliance. The MoU regimes use this data to rate the flags on a spectrum of White List, Grey List and Black List status, which distinguishes quality flags from those deemed poor or high risk (Paris MoU, 2017).

The maintenance of quality and safety standards on ships is facilitated by organisations known as "classification societies." The International Association of Classification Societies (IACS) has 12 member societies including Lloyd's Register, Bureau Veritas and the China Classification Society. IACS, which is also an organisation in consultative status with the IMO, provides a Quality System Certification Scheme that its members are required to comply with (IACS, n.d.).

1.2 African Initiatives on Regional Economic Communities Shipping Lines and the Blue Economy

The AU Agenda 2063 identifies Africa's Blue/Ocean economy as a major contributor to continental transformation and growth, through, *inter alia*, the growth of an Africa-wide shipping industry, the development of sea, river and lake transport and the exploitation and beneficiation of deep sea mineral, fish and other resources (African Union, 2015).

The 22nd Ordinary AU Summit of 2014, held in Addis Ababa, Ethiopia, adopted the African Integrated Maritime (AIM) Strategy to foster increased wealth creation from Africa's oceans and seas, by developing a thriving blue economy in a secure and environmentally sustainable manner (African Union, 2012a; 2012b; 2014). The AIM Strategy highlighted that African-owned ships accounted for about 1.2% of world shipping by number and about 0.9% by gross tonnage. This motivated the African RECs/RMs and Member States to significantly improve their share of global vessel ownership. The Strategy also envisioned the creation of a Pan-African-owned Shipping Line and set the target of African-owned ships carrying at least 10% of global cargo by 2030 and scaling up to 15% by 2050 (African Union, 2012b).

The AU Extraordinary Summit of Heads of State and Government held in 2016, adopted the African Union Charter on Maritime Security, Safety and Development. The aim of the Lomé Summit was to make the maritime space the key driver of Africa's economic and social development. Part of the outcome of the Summit was to propose coordinated maritime security action to ensure the safety of African seas and oceans and to counter transnational crime on the high seas.

The Ghana National Chamber of Commerce in 2016, announced an initiative to establish a West African regional shipping line, in collaboration with other West African chambers of commerce (Mohammed, 2017). The Indian Ocean Commission also adopted the idea of establishing a regional shipping line in 2013 (Indian Ocean Commission, 2013; Uppiah, 2016).

The Indian Ocean Commission noted that the establishment of a regional maritime cabotage service would facilitate "the transfer from large ports to smaller ports by shortening the length of road/rail transport to the final destination within the country." In a related thrust, Article 15 of the Revised African Maritime Transport Charter underscores that pan-African maritime cabotage would promote intra-African trade, as it would facilitate direct linkages between African ports and shorten the road/rail linkages into the hinterland (African Union, 2010).

1.3 The Current State of Vessel Ownership in Africa and the COMESA Region

The COMESA region, along with the rest of Africa, holds a comparatively low stake in the global shipping industry. This paper's assessment of ownership status is based on the concept of "beneficial ownership," which is defined by the United Nations Conference on Trade and Development (UNCTAD) as ownership that indicates the economy in which the company that has the main commercial responsibility for the vessel is located. This may differ from the country in which the vessel is registered. Beneficial ownership provides a better indication of true vessel ownership than the mere numbers of ships appearing in a national ship registry, especially in cases of open registries offering Flags of Convenience (where the ship is registered in a nationality other than that of its actual owners). The levels of beneficial vessel ownership in the COMESA Region, Africa, the world's top five owners and the world in 2016 is shown in Table 1. Besides the number of vessels beneficially owned by the country, Table 1 also indicates the total deadweight tonnage (DWT) of the ships, which represents the ships' total carrying capacity in metric tons.

Table 1: Beneficial Ownership of in 2016

Country	**Number of Vessels**			**Total Deadweight Tonnage (DWT)**
DRC	5			16,000
Djibouti	1			3,000
Egypt	217			3,122,000
Eritrea	4			13,000
Ethiopia	15			398,000
Kenya	8			19,000
Libya	32			2,440,000
Madagascar	1			1,000
Mauritius	6			148,000
Seychelles	12			250,000
Sudan	4			22,000
COMESA Total	**305**			**6,432,000**
Algeria	44			1,395,000
Angola	51			5,402,000
Cabo Verde	7			10,000
Cameroon	3			429,000
Congo	3			257,000
Equatorial Guinea	2			3,000
Gabon	2			2,000

Gambia	1			2,000
Ghana	9			27,000
Guinea	1			3,000
Liberia	8			124,000
Mauritania	1			9,000
Morocco	21			93,000
Mozambique	4			9,000
Namibia	5			27,000
Nigeria	261			4,924,000
Senegal	2			2,000
Sierra Leone	2			6,000
South Africa	55			1,940,000
Tunisia	12			303,000
Tanzania	11			34,000
Africa Total	**810**			**21,433,000**
Greece	4,136			293,087,000
Japan	3,969			228,980,000
China	4,960			158,884,000
Germany	3,361			119,181,000
Singapore	2,553			95,312,000
World Top Five Total	**18,979**			**895,444,000**
World Total	**49,223**			**1,557,654,000**

Source: Author adapted from UNCTAD (n.d.)

Table 1 shows that COMESA region had beneficial ownership of 305 ships with a total deadweight tonnage of some 6.4 million tonnes in 2016. This accounted for 0.62 percent of the ships in the world fleet and 0.41 percent of world deadweight tonnage. Africa had 1.65 percent beneficial ownership of ships in the world fleet, representing 1.37 percent of world deadweight tonnage. Angola had the highest deadweight tonnage in Africa, followed by Nigeria and Egypt. The world's top five ship-owning nations were Greece, Japan, China, Germany and Singapore, with a combined ownership of 38.56 percent of the ships in the world fleet, representing 57.49 percent of world deadweight tonnage.

1.4 Container Traffic in Africa and COMESA Region

The next indicator of Africa's status in the world shipping industry is the container traffic being handled by the continent's ports. World Bank data indicates that Africa handled 24.7 million Twenty-foot Equivalent Units of containers (TEUs), while 12.4 million TEUs were handled by ports in the COMESA region in 2014. Table 2 shows container traffic in COMESA Region, Africa and the world in 2014. There was no data for a number of countries, therefore, the actual African TEU traffic could be marginally higher than recorded.

Table 2: Container Traffic Handled in the COMESA Region, Africa and the World in 2014

Country	TEUs Handled
Egypt	8,810,990
Kenya	1,010,000
Djibouti	773,141
Mauritius	653,635
Sudan	565,810
Libya	456,773
Madagascar	181,808
COMESA Total	**12,452,157**
Algeria	360,522
Côte d'Ivoire	783,102
Morocco	3,070,000
Mozambique	328,200
Namibia	131,180
Nigeria	1,062,389
Senegal	450,008
South Africa	4,831,462
Tanzania	638,023
Tunisia	600,986
Africa Total	**24,708,029**
World Total	**679,264,658**

Source: Author adapted from World Bank (n.d. - a)

It may be deduced from Table 2 that the COMESA region handled 1.83 percent of global container traffic, representing about a half of all containers handled in Africa in 2014.

1.5 Shipping Costs in the COMESA Region

The reliance on foreign-owned vessels as carriers of Africa's imports and exports induces high shipping costs that adversely affect the region's international trade competitiveness. Freight rates are determined at international shipbroking markets and are dictated by forces outside the control of the African economies. These shipping costs are further escalated by costs for documents, administrative fees for customs clearance and technical control, customs broker fees, terminal handling charges and inland transport costs.

Table 3 shows the average costs to import and export a 20-foot container in COMESA Member States in 2014. It also shows comparisons with the Sub-Saharan African, high income nations and the world averages.

Table 3: Cost to Import and Export 20-foot containers in 2014

Country	Cost to Import (US$)	Cost to Export (US$)
Burundi	4,420	2,905
Comoros	1,295	1,295
DRC	4,290	3,365
Djibouti	910	885
Egypt	790	625
Eritrea	2,000	1,850
Ethiopia	2,960	2,380
Kenya	2,350	2,255
Libya	1,255	1,140
Madagascar	1,555	1,195
Malawi	2,895	2,200
Mauritius	710	675
Rwanda	4,990	3,245
Seychelles	675	705
Sudan	3,400	2,630
Swaziland	2,245	1,980
Uganda	3,375	2,800
Zambia	7,060	5,165
Zimbabwe	6,160	4,265
COMESA Average	**2,807**	**2,187**
Sub-Saharan Africa Average	**2,931**	**2,201**
High Income Countries' Average	**1,110**	**1,006**
World Average	**1,877**	**1,560**

Source: Author adapted from World Bank (n.d. – b) and World Bank (n.d. - c)

Seychelles emerged had the lowest container import costs in Africa. Thirteen African countries were among the 20 most expensive countries to ship a 20-foot container to in the world, with costs ranging from US$3,710 to US$9,285 per container (World Bank, n.d. – b). Five of the 13 most expensive African countries to ship to were COMESA Member States.

In terms of the cost of exporting containers, 12 of the most expensive 20 countries were in Africa, out of which six are COMESA Member States (World Bank, n.d. - c). Egypt was the cheapest COMESA Member State to export from.

The average container import and export costs in the COMESA region were slightly below the Sub-Saharan African average, but double the average costs in high income countries. Container costs within the COMESA region showed significant variance, with Egypt, Mauritius and Seychelles being the most competitive. Musengele, Othieno &

Kapindula (2016), found that it was more expensive to ship a container from Mauritius to Mombasa, compared to shipping the same from China to Mombasa. Both routes took 30 days despite the longer distance from China.

Shipping costs render a significant portion of COMESA trade uncompetitive on the world stage, reinforcing the need for a regional shipping mechanism to reduce trade costs. Zamora (1971) outlined the hazards presented by the lack of control of freight shipping costs, in that developing countries must depend upon foreign carriers to ship their exports and imports, and must pay for these services in foreign currency, with attendant balance-of-payments problems. Uppiah (2016) underlined the need for the removal of tariff and non-tariff barriers to encourage regional trade and promote the use of regional shipping lines.

1.6 COMESA Human Capacity Development in the Maritime Sector

Besides the need to develop physical shipping infrastructure and hardware, COMESA region needs to develop the software in terms of human resources to drive and sustain growth in the maritime sector. An analysis of global seafarer supply data shows that only Egypt, Ethiopia and Sudan contribute seafarers to various shipping lines: (Ellis and Sampson, 2003).

Blédé (2015) noted that African seafarers constituted less than two percent of the global seafaring workforce. This was partially attributed to lack of African shipping lines that could train and employ African seafarers. He gave the example of seafarers studying at the Regional Academy of Science and Technology of the Sea in Abidjan, Côte d'Ivoire, who have difficulties obtaining internships and practical experience aboard commercial vessels, without which they cannot not advance in their seafaring careers.

That notwithstanding, there exist several African regional institutions that address human capital development in the maritime sector. Those in COMESA region include:

* Djibouti Regional Maritime Training Centre;
* Arab Academy for Science, Technology and Maritime Transport, Egypt;
* Ethiopian Maritime Training Institute;
* Bandari College of the Kenya Ports Authority;
* Regional Center for Consultation and Training, Sudan;
* Mauritius Maritime Training Academy; and
* Seychelles Maritime Academy.

The existence of these institutions confirms the potential for the COMESA region to roll out seafarer and other Blue Economy human capacity development programmes. An extensive institutional framework is readily accessible to service the human resource requirements of the COMESA Shipping Line. Through the IMO and other international organisations, COMESA Member States can access further technical cooperation support programmes around the world. The World Maritime University and the International Maritime Law Institute offer various training and capacity-building programmes (IMO, n.d. – d).

1.7 The Seven-Step Roadmap

The roadmap consists of seven steps indicating sequential and key deliverables required to establish a viable regional shipping line.

Step One: Undertake empirical research and data compilation to establish cargo statistics and requirements

In the operationalization of the COMESA Shipping Line, the first step would be to compile statistical data, across all participating Member States, on the following:

* Total Imports and Exports of cargoes indicating product type, source, weight, quantities and destination or source country;
* Bulk goods requirements (grains, solid minerals, oils, liquids, gases);
* Refrigerated and other special cargoes;
* Cargo transit times; and
* Ports of loading and discharge.

A shipping line is as viable as the continued supply of cargo on all legs of its routes. This calls for the matching and synchronization of exports and imports to ensure vessels have sufficient cargo on both outbound and inbound journeys. The quantification of the COMESA region's import and export trade tonnages would also enable the distillation of the number, size and types of vessels required for the COMESA Shipping Line.

Key stakeholders in this phase are freight forwarding associations, national revenue authorities, national port authorities and national rail authorities, as they have primary data on import and export volumes, dimensions and weights, as well as seasonal trends.

Step Two: Establishment of a COMESA non vessel owning common carrier

Data obtained in step one could be used to facilitate the establishment of a consolidated COMESA shipping and freight forwarding mechanism in the form of a Non-Vessel Owning Common Carrier (NVOCC). The United States Nasdaq Stock Exchange defines an NVOCC as an ocean carrier that does not own or operate their own vessels. They use less than full container loads which they ship on actual ship lines and issue their own bills of lading which are backed up by actual on board ocean bills of lading issued to them by the other carrier" (Nasdaq, n.d.). However. there is no impediment to the NVOCC using full container loads or booking large cargo hold sections to ship goods.

The COMESA NVOCC could be established through a cooperative alliance of freight forwarding groups in various COMESA Member States that establish a mechanism for cargo consolidation. This stage may also involve increasing the share of COMESA-owned containers.

Cargo consolidation is a necessary precursor to the operationalization of a regional shipping line. This would facilitate the pooling or consolidation of COMESA products headed to common destination ports, to increase economies of scale. The same measures could be employed to pool imports to share and minimise the shipping costs. Cargo consolidation will also enhance intra-COMESA trade and internal value addition

as there would be a more harmonised approach to external markets and towards import requirements.

Step Three: Establishment of seamless sea-rail-road linkages and distribution hubs

The operationalization of the COMESA Shipping Line needs to be accompanied by critical linkages with the port, rail and road sectors as the improved efficiency of the movement of goods on the high seas would result in more pressure on ports and the rail/road distribution networks.

The COMESA Shipping Line would require the establishment of one or more regional distribution centres, modelled along the lines of Rotterdam, Hong Kong or Singapore. Deep-sea trade from outside the COMESA region could be unloaded at the regional distribution centres before being relayed to the various smaller ports by coastal cabotage vessels or by road/rail transport.

This may be further facilitated by the establishment of COMESA regional export processing zones, import handling terminals, export handling terminals, bulk goods terminals and specialist ports focused on types of commodities. COMESA island states could serve as Indian Ocean transhipment hubs for the region, while Atlantic transhipment hubs could be established in Member States or even through the leasing of facilities from non-Member States, for port development (such as dry ports) and inland cargo consolidation.

Step Four: Developing a chartering mechanism

The fourth step is that of chartering vessels to service the COMESA region's trade needs, starting with sectors that have the requisite bulk tonnage. Chartering would avail the COMESA Shipping Line the necessary experience to ultimately purchase and maintain its own fleet. The International Chamber of Shipping recognises three main types of charters (Khosla, n.d.). First, the time charter where the vessel is hired on the basis of a specified time period. The second type is the voyage charter, where the ship-owner charges freight per tonne of cargo to specified ports of loading and discharge. Finally, the bareboat or demise charter is one where the whole ship is chartered and flagged by the charterer-in, who assumes effective control over the vessel.

On the first steps, a country should take towards vessel ownership. Metaxas (1972) argued that developing countries trying to become maritime powers should initially gain experience by buying second hand ships which run without fixed schedules (also known as "tramp" ships), before venturing into the more complex liner service arena that has fixed schedules. He explained that this approach would enable developing countries to obtain the necessary technical and managerial know-how (and the maritime tradition where it does not exist) which constitute fundamental pre-requisites for economically efficient participation in more sophisticated international maritime models. However, rather than going the route of buying second-hand ships, as suggested by Metaxas, the more plausible approach could be for the COMESA Shipping Line to initially charter vessels rather than owning them outright.

Step Five: Establishment of National Ship Registers, National Shipping Lines and an Alliance of National Shipping Lines

The chartering experience could then culminate in the imperative of the actual ownership of vessels by COMESA Member States. This stage would require Member States to

establish National Ship Registers that would enable them to flag vessels and procure ships to constitute the COMESA Shipping fleet. The national shipping fleets of COMESA Member States could form a Liner Conference or alliance, trading under a common name: the "COMESA Shipping Line" or any other preferred name.

Long-term planning is required to develop a ship finance mechanism, backed by concrete demand and supply factors. In a typical ship finance arrangement, as illustrated by Mizuho Bank of Japan (2013), a Special Purpose Company (SPC) is set up as the borrowing entity, which would enter into a loan agreement with the bank and borrow funds for the purchase of the vessel. Collateral instruments would be required, typically a mortgage on the vessel itself, underwritten by insurance of the hull (the main body of a ship) and charter fee receivables.

The SPC then leases the vessel to a charterer and receives charter fees in return. The charter fees are used to pay back the principal and interest of the ship finance loan. The typical repayment term is 15 years for a newly-built bulk carrier.

Whilst the initial vessels purchased for the COMESA Shipping Line could be ordered from existing shipbuilding nations of which China, South Korea and Japan are currently the largest shipbuilders in the world, there is need for a long-term approach to promote the establishment of a shipbuilding industry within the COMESA region, as well as facilities for ship repair and maintenance. This stand-alone shipbuilding, ship maintenance and repair industry would service the COMESA Shipping Line and any other African and international lines plying the region's shores.

Step Six: Securing extra-COMESA business

The COMESA Shipping Line could achieve and enhance profitability by securing business and efficiencies outside the COMESA region. The COMESA – EAC – SADC Tripartite Free Trade Area (TFTA), as well as the African Continental Free Trade Area (CFTA), present opportunities for further consolidation of cargoes to enhance profitability of African-owned shipping lines. The COMESA Shipping Line would be able to expand its scope of operations to other Regional Economic Communities in Africa. Ultimately, a shipping line is a global business that would be able to generate revenues from ports of call across all continents and islands worldwide.

The COMESA Shipping Line may also harness opportunities availed by initiatives such as China's 21st Century Maritime Silk Road (Lim, 2015), where the COMESA region could establish itself as a trading and logistics hub linking Asia, Europe and the America.

Step Seven: Capacity-building processes

Capacity building is a continuous and ongoing process. Uppiah (2016) suggested that, when establishing a regional shipping line, each country should specialise in a particular aspect such as insurance, maintenance, bunkering (refuelling) or other service, rather than having all these aspects duplicated in each Member State.

The five key capacity-building requirements for the COMESA Shipping Line are:

1. Education and training of human resources;
2. Enactment and domestication of maritime sector legal instruments;

3. Active membership of international shipping and maritime organisations;

4. Enhancement of port and transport logistics efficiencies; and

5. The maintenance of the security of ships and ports.

Roadmap Implementation Framework

The seven-step roadmap proffered is a "bottom-up" approach involving grassroots organisations including freight forwarding associations, which are presently at the frontline of the COMESA region's import and export activities. However, since the establishment of a shipping line has profound legal and bureaucratic requirements, a top-down approach is required in setting up the overarching regional and continental vision, the framework and the enabling environment.

The shipping liner sector differs from that of trucking, airlines and railways because, in the context of the COMESA market, it requires cargo consolidation across several countries to achieve viability. The sequencing approach laid out in the seven-step roadmap enables the organic growth of the COMESA Shipping Line from merely aggregating and consolidating cargo, to operating a non-vessel owning liner, until the economies of scale dictate the viability of chartering and ultimately vessel ownership.

Blédé (2015) emphasizes that public-private partnerships are essential in the establishment of shipping lines, which are too capital intensive for the private sector to go it alone. This underlines the need for a public-private partnership approach in setting up the framework of the COMESA Shipping Line.

Another pertinent issue concerns how the COMESA Shipping Line would operate against foreign competition, as international shipping is an open and deregulated sector. According to Uppiah (2016), even when a regional shipping line is established, a liberalized shipping dispensation would allow more competition and benefit both shippers and consumers. Liberalization entails the COMESA Shipping Line competing at par with foreign liners, thus having to achieve competitiveness at least on the basis of pricing and efficiency. There is credence to the idea of fostering competition that ensures that the customer becomes the ultimate beneficiary of lower shipping costs as this boosts the competitiveness of the region's international trade. However, COMESA region could grant its vessels preferential access to cabotage trade, that is, trade along the COMESA coastline.

Conclusions and Policy Recommendations

Conclusion

The operationalization of the COMESA Shipping Line is anticipated to address prevailing high shipping costs faced by the region. There may appear to be a wide gap between the status quo of the COMESA region's low vessel ownership, low numbers of seafarers and low container traffic statistics, and the end-state envisioned by the operationalization of the COMESA Shipping Line. However, the achievement is possible, in as much as the 20th century witnessed the emergence of new maritime powers, such as China and Singapore.

The African Integrated Maritime Strategy has set the target of Africa owning seven percent of the world's ships, and African-owned ships carrying 15 percent of global cargo, by 2050. African economies stand to benefit from harmonising their trading positions on the international stage, especially through cargo consolidation and shipping logistics cooperation, buttressed by enhanced intra-African trade. The COMESA Shipping Line could be a broad-based initiative that catalyses concrete steps by Member States to deepen their stake in the Blue Economy and forge alliances that would yield a vibrant regional, continental and international shipping and trading capability.

Policy Recommendations

The policy recommendations from the paper are:

1. Data on COMESA regions' imports and exports tonnages, as well as the source and destination markets should be compiled to enable the quantification of the region's shipping requirements.

2. The COMESA region should adopt a cargo-consolidation mechanism to benefit from economies of scale and efficiencies of shared transport costs on deep-sea routes.

3. Regional cargo distribution and transhipment hubs and a regional maritime cabotage mechanism should be set up to allow for seamless and cost-efficient movement of cargo from the high seas to the hinterland.

4. Where the quantities of cargo dictate, COMESA exporters and importers should collaborate to charter vessels.

5. COMESA Member States should develop maritime-sector legal frameworks to enable them to register ships and operate shipping lines.

6. Pan-African classification societies should be established to internalize the capabilities of ship surveys, audits and inspections.

7. The COMESA region should promote the establishment of a shipbuilding industry as well as ship repair and maintenance facilities, to service the COMESA Shipping Line and other international liners.

8. The COMESA Shipping Line should leverage on international organizations in the shipping line sector, notably the IMO.

9. COMESA Member States should develop maritime-sector human capacity and regularly send students to institutions such as the World Maritime University, the International Maritime Law Institute and other international maritime training institutions.

10. The COMESA region should position itself to become a global trans-shipment and logistics hub, linking Africa, Asia, Europe and the America.

11. The African private sector should be fully engaged to secure the scaling up of their involvement in the international shipping industry.

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The Effect of Regional Economic Communities on Market Integration and Industrialization: **The Case of COMESA**

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Abstract

The paper seeks to establish the contribution of the COMESA programmes in promoting intra-regional trade and industrialization. It further seeks to establish the link between intra-regional trade and productivity. The paper used a gravity model to estimate a cross-sectional time-series (panel) dataset for the period 2001 to 2015. The results indicate that membership to COMESA has created large markets and promoted regional trade among Member States. However, results also confirm that COMESA Member States still heavily trade with non-members. The study further reveals that the share of foreign total factor productivity to COMESA's total factor productivity are weaker than expected suggesting non-convergence to international knowledge spillovers. The study concludes that COMESA programmes have positively impacted on market integration and industrialization. We therefore recommend that COMESA should; continue implementing strategies, policies and programmes that promote regional integration, industrialization and technology transfer.

1.0 Introduction

Africa's Regional Economic Communities (RECs) do not only constitute key building blocks for economic integration, but are also central to various transformative programs of the continent. Thus, they are essential and instrumental for the effective implementation, financing, monitoring and evaluation of regional integration programmes. The main objective of RECs is to increase intra-regional trade. This notwithstanding, intra-African trade has stagnated at less than 15 percent (UNECA[8], 2015). Given the dismal intra-African trade performance, both the continental and regional level initiatives are targeted at establishing pan-African trade pacts as part of a broader effort to increase intra-regional trade within the continent.

RECs on the African continent continue to pursue initiatives aimed at industrialization. Many stakeholders in the continent advance the view that regional groupings in Africa should comprise large numbers of Member States in order to provide markets of sufficient size to ensure economies of scale in production (Hall, 1987). This position reflects prevailing beliefs of the need for developing countries to engage in a strategy of 'collective self-reliance' by promoting economic interdependence (and especially trade) with one another and pursuing a form of import-substituting industrialization at the regional, rather than national level. The treaty that established the Common Market for Eastern and Southern Africa (COMESA) - Article 70 provides for Member States to embrace initiatives that facilitate trade and these include among others removal of tariff and non-tariff measures, building of infrastructure, and crafting policies and strategies to industrialize. Thus, trade facilitation is the key initiative towards this end.

Industrialisation is at the core of the developmental integration agenda of COMESA. COMESA has formulated a common industrial policy, aimed at fostering the economic transformation of the region through industrialization. The policy addresses the economic transformation of the COMESA region through an inclusive and sustainable industrialization based on value addition, local content and Small and Medium Enterprises participation in the national, regional and global supply chain. In this regard the industrial policy targets promotion of manufacturing through agro processing, leather and leather products, cotton and garments, mineral beneficiation, light engineering and pharmaceuticals.

1.1 State of Industrialization in the COMESA Region

The contribution of industry to GDP stood at 24 percent between 1965 and 2015 and is projected to increase to 26 percent by 2020. Over the same period the share of agriculture in GDP fell from 38 percent to 27 percent. The services sector expanded from 38 percent in 1965 to 49 percent in the same period. This trend suggests that the share of GDP in the industrial sector is lower than the share of GDP in other the sectors as shown in Table 1 in the Appendix.

The proportion of manufactured exports is an indicator of the level of industrialization of a country/region. Table 2 in the Appendix shows the proportion of manufactured exports by COMESA Member States compared to a few selected similar Asian countries[9]. The statistics suggest that, the proportion of manufactured exports is significantly smaller

8 *United Nations Economic Commission for Africa*

9 These countries had similar indicators to many COMESA countries in the 1960s and 1970s

in the COMESA region compared to the selected Asian countries. Whereas the Asian countries have averages ranging from 50 to 90 percent, with the exception of Swaziland and Mauritius which range between 50 and 70 percent, the rest of the COMESA Member States range between 5 and 40 percent. The manufacturing value added (MVA) as a proportion of GDP, is also lower in the COMESA region relative to the comparator Asian countries.

1.2 Objective of the Study

This paper seeks to measure the effects of the RECs on market integration, industrialization and productivity. Specifically, the study seeks to:

1. Establish the contribution of the COMESA programmes to market integration reflected in the value and volume of trade;
2. Determine the role of the regional integration processes in the COMESA region to industrialization as reflected by the proportion of manufactured exports; and
3. Establish whether a link exists between COMESA trade and productivity using spillovers in a multi-country model.

2.0 Review of the Literature

There are a number of theories that underpin trade in general and economic integration in particular. These theories include mercantilism, absolute advantage, comparative advantage, factor intensive trade creation and diversion, foreign direct investment, economies of scale and dynamic effects among others. The paper addresses itself to those theories that are relevant to the research objectives.

Mercantilism is based on the philosophy that the wealth of a nation depends on exports rather than imports, thus advocating for the protection of the home market (Magnusson, 2003). This theory considers exports as a gain and imports as a loss because they drain the country's resources and thus they must be restricted through tariffs and non-tariff barriers. In the theory of Absolute Advantage nations should specialize in the production of commodities they are best suited to produce, export the surplus and import what they are not good at (Smith, 1776). A country has an absolute advantage in the production of a commodity it is best at and an absolute disadvantage in the making of a commodity it is not good at. Hence countries benefit more by reducing or removing trade barriers between themselves (Magnusson, 2003). Thus, when countries enter into a customs union, both benefit by removing trade barriers and let each one specialize in what it is best at.

In the theory of comparative advantage, a country should not produce commodities in which its inferiority degree is lower but instead produce and export in which its superiority degree is highest (Ricardo, 1891). Therefore, even poor and apparently inefficient countries would still benefit by entering into a customs union with countries that appear efficient and well - off. However, one of the main criticisms of this model is that it is a static concept, which ignores the dynamic elements in real life situations.

Heckscher and Ohlin theory postulates that it takes a combination of land, labour, and capital to make a product and that countries are endowed differently in terms of these factors (Leontief, 1953). Thus, capital-intensive countries will export capital-intensive

commodities while importing labour intensive goods. Therefore, nations should specialize in the production of those goods that use more of their abundant resources and import those that use more of the resources, which are scarce at home. The criticisms of this theory are similar to those of the comparative advantage, mentioned above in that strategic investment and scale can alter the advantages brought about by the intensity of the location of the factors of production.

Whereas theories of trade have existed for a long time, it was only during the 1950s that academicians began to critically examine the phenomena of the customs union in its own right and therefore economic integration. It was the pioneering work of Viner that laid the theoretical foundation for integration distinct from the theories of international trade and it was from this work that the theories of trade creation and diversion effects first emerged (Viner & Oslington, 1950/2014).

The theory of large-scale economies, has been used to justify international trade even among nations that seem to be similar in natural resource endowment, the level of technology, skilled labour and infrastructure (Krugman, 1980). Large economies of scale are used to justify integration because when nations form trading blocks, a large market is created and thus firms serving the new union expand to meet the increased demand and thereby benefit from the ensuing reduced unit costs of production. This theory is based on the assumption that before integration firms were operating below capacity; thus, they can increase production without necessarily increasing the fixed costs, thus bringing the average cost down.

Baldwin & Venables (1995) links regional integration agreement to productivity through three key effects on allocation, accumulation and location. The first consists of regional integration agreements impact on the static allocation of resources, in settings with both perfect and imperfect competition. Accumulation effects observes that regional integration will affect growth if it changes the returns to investment in physical, human, or knowledge capital subsequently leading to increased accumulation. With regard to location, a regional integration agreement may amplify inequalities between regions, which can be seen by considering integration between two countries with different market sizes. The country with the large market is a 'central' region, with easy access to a large market while the other country is 'peripheral', having relatively few local consumers. They argue that during integration, firms in an imperfectly competitive industry will be drawn towards 'central' areas of the region.

Whereas empirical literature reveals that in the European Union and other developed nations, integration is by and large positively associated with trade creation and that it has a positive impact on these economies, it is inconclusive for developing countries, (Head & Mayer, 2013). In the developing nations, the findings are a mixed bag, with some researchers (Shinyekwa & Othieno, 2013) confirming a positive link between integration and trade creation and others failing to confirm the same or even find that integration is net trade diverting (Afesorgbor & Bergeijk, 2014; Riedel & Slany, 2015). Not only is the literature inconclusive across the board, but also the coverage of this topic in the developing world is scanty, yet the number of integrating blocks and resources employed is on the increase (Buigut, 2012).

Wanjala (2004) suggests that COMESA has the effect of trade creation while no evidence for trade diversion is found. A more elaborate work on continental integration was undertaken by Musila (2005). The study found that the intensity of trade creation or diversion varies from region to region and from period to period. The intensity of trade

creation is higher in the ECOWAS followed by COMESA. The estimated results however suggest that the trade creation effects are weak in the three regional organisations. The results reinforce the idea that size factors (level of GNP and population) and resistance factors (distance and language) play an important role in the determination of the flow of international trade. Key to note here, however, is that proximity already provides a basis for increased trade and the subsequent need to industrialize. For landlocked countries, their trade with neighbouring countries is crucial and they are linked with international markets through countries with ports. However, light high value goods as well as perishable products like horticulture are usually transported by air thereby downplaying the role played by distance.

Kamau (2010) applied a system Generalized Method of Moments (GMM) estimation technique to examine the impact of economic integration on growth by constructing an economic integration index based on average Most Favoured Nations (MFN) tariffs and the level of regional cooperation for COMESA, EAC and SADC. The results confirm a positive relationship between economic integration and economic growth. Economic integration and trade, separately and jointly, have a positive and significant impact on growth.

The available literature on productivity spillovers largely focuses on the interaction of domestic firms and foreign firms within the economies. Guellec & De (2002) used econometric estimates conducted on a panel of 16 OECD countries[10], over the period 1980-98 to investigate the long-term effects of various types of R&D on multi-factor productivity growth, which are the spillover effects of Research and Development (R&D) activities. They show that an increase of 1 per cent in business R&D generates 0.13 per cent in productivity growth. Moreover, the effect is larger in countries that are intensive in business R&D. On the other hand, Crespi et al. (2008) explores the role of knowledge flows and productivity growth by linking direct survey data on knowledge flows to firm-level data on Total Factor Productivity (TFP) growth in the United Kingdom (UK). They found out that the main sources of knowledge are competitors; suppliers; and plants that belong to the same business group. Although these three flows together account for about 50 percent of TFP growth, the main information flow spillover is from competitors and multinational presence contributes to this spillover.

The positive significance of promoting foreign investments is presented by Grossman & Helpman (1991) who, using a model of endogenous innovation and growth shows that policies that reduce the extent of international trade strengthen the undersupply of innovation, leading to low growth. The openness being promoted by COMESA can therefore be seen as promoting a facilitative environment for foreign firms to invest within member states in order to encourage innovations.

According to Blomström & Sjöholm (1999) foreign establishments have comparable high levels of labor productivity compared to domestic establishments and domestic establishments benefit from spillovers from these foreign establishments. However Velde (2006) argue that while FDI is often superior in terms of capital and technology, spillovers to local economic development is not automatic. There is need to build domestic human resource and technological capabilities to raise the absorptive capacity to capture productivity spillovers from Transnational Corporations. This is supported by Borensztein & Lee (1998) who utilizes data on FDI flows from industrial countries to 69 developing countries over the two decades to test the effect of FDI on economic growth. Their results suggest that FDI is an important vehicle for the transfer of technology,

10 These include; Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Spain, Switzerland, Great Britain and United States of America.

contributing relatively more to growth than domestic investment but this is only the case when the host country has a minimum threshold stock of human capital.

Djankov & Hoekman (2000), uses firm-level data for the Czech Republic to show that during 1992–96 foreign investment had the predicted positive impact on total factor productivity growth of recipient firms.

Fauzel & Sannasee (2015) used a dynamic vector error correction model, catering for dynamic, endogeneity and causality issues to addresses the important question of whether foreign direct investment in the manufacturing sector enhances the productivity of the sector in Mauritius. Using time series data for the period 1980-2010, they show that FDI in the manufacturing sector has indeed contributed to both total factor productivity and labour productivity in the long run. However, they found that in the short run, FDI contribution to influence productivity is very small.

Although a few studies have been conducted on the subject area, the areas of industrialization and market integration are scanty and not encompassing all the COMESA Member states. This paper seeks to make a contribution by addressing this gap.

3.0 Methodology

3.1 The Theoretical Model

This study adopts the gravity model, as first applied to trade flows by Tinbergen (1962). In its crude form, the model postulates that trade flows between country i and j is given by a gravitational constant (G), the economic activity in country i (Y) and county j (E) and the distance (D) between them, expressed as follows:

$$X_{ij} = \frac{G\left(Y_i\, E_j\right)}{D} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(1)}$$

Distance (D) is used as a denominator because it is assumed to negatively affect the trade flows. It is formalized into equation (2) where trade between two countries X_{ij} is directly proportional to their economic sizes Y_iY_j proxied by their respective GDP and which is inversely proportional to their economic distance D_{ij} proxied by their physical distance (Koh, 2013) as expressed in equation (2).

$$X_{ij} = f(Y_iY_j/D_{ij})\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(2)}$$

3.2 Empirical Models

The model is adopted from Dion (2014) and is composed of four equations: two gravity equations and two productivity functions. Each pair of equations is composed of one equation for market integration and one equation for industrialization. The paper estimates the equations on a cross-section time series (panel data) for the period 2001 to 2015. The objective is to use the two sets of approaches, gravity and productivity equations, to build a model that determines the impact of COMESA on market integration, industrialization and productivity. Unlike Dion (2014) the paper implements a compact analysis as opposed to a cross country analysis.

3.2.1 The gravity equations

The gravity equations allows for a discussion on the specific effect of a COMESA on market integration and industrialization along the traditional economic variables such as GDP, population or distance between pairs of countries. Particularly, the effects of COMESA are captured by the inclusion of a dummy variable. The use of dummies helps to discuss the role of voluntary biases or policies taken by countries to reinforce their bilateral trade. The dummies are equal to one when we want them to display the impact of a COMESA membership, contiguity or language on market integration or Industrialization. The paper also uses market size variable (population) in terms of size effect to measure the size of countries. The study also measures the effects of languages spoken in COMESA region given that the languages are not homogenous. While it is likely that most countries in COMESA speak English, others like Democratic Republic of Congo (DRC), Rwanda and Burundi speak French. The hypothesis in this case is that heterogeneity in language may suggest divergence in interest. The paper also measures the effects of being landlocked on market integration and industrialization. The gravity equation is estimated as shown in (3) and (4):

$$Log\ M^{ij} = \alpha + \beta_1\ Log\ (Y^j) + \beta_2\ Log(PoP^j) + \beta_3\ Log(Dist^{ij}) + \beta_4 Log(Border^{ij}) + \beta_5\ Log(Language^{ij}) + \beta_6 Log(Landlocked^{ij}) + \beta_7\ Log(COMESA^{ij}) + \varepsilon^{ij} \quad \ldots\ldots (3)$$

$$Log\ Industry^{ij} = \alpha + \beta_1\ Log\ (Y^j) + \beta_2\ Log(PoP^j) + \beta_3\ Log(Dist^{ij}) + \beta_4\ Log(Border^{ij}) + \beta_5\ Log(Language^{ij}) + \beta_6 Log(landlocked^{ij}) + \beta_7\ Log(COMESA^{ij}) + \varepsilon^{ij} \ldots\ldots\ldots (4)$$

Where M^{ij} and Industry ^{ij} represent Market Integration and Industrialization respectively between country *i* and *j*. GDP is represented by Y^i. PoP^j represents population. Distance between the two capitals is represented by $Dist^{ij}$. $Border^{ij}$ represents common border $Language^{ij}$ represents a common language. Landlocked countries are represented by $landlocked^{ij}$. $COMESA^{ij}$ represents when two importing countries *i* and *j* are members of COMESA. The analysis is able to sort out the respective influence of geographical proximity versus preferential trading policies in COMESA. Note that the evolution of market integration and industry is measured by the value of imports and manufacturing value added, respectively.

3.2.2 The productivity equations

Given that market integration and inflows of FDI can act as a channels for technology transfer and convergence in the COMESA region, the study estimates two productivity equations: one for market integration and the other for Industrialization. The productivity functions borrow from the endogenous growth model mechanism. The study uses lagged Total Factor Productivity (TFP) to measure the presence of a conditional convergence effect. In order to measure the delay of transmission, our formulation gives us the lags attached to the foreign TFP variable before it affects the domestic TFP (see equation 5).

Every COMESA Member State can potentially benefit from foreign TFP through trade since they can cumulate their own domestic TFP with the trade-weighted TFP of their partners. They thus have access to an available stock of knowledge higher than their own. Trade-related TFP is the weighted average of foreign-produced TFP, where the weights are calculated given the bilateral import shares.

$$A^i = \alpha + \beta_1\ (A^d{}_{t-1}) + \beta_2 \left(\frac{A^j{}_{t-1} * X^{ij}{}_{t-1}}{Log\ Y^j}\right) + \varepsilon^{ij} \qquad (5)$$

Where A^i is the stock of knowledge available to the i country measured by TFP, α is country specific constant, the elasticity of domestic and foreign productivity spillover are measured by β_1 & β_2 respectively. A^d_{t-1} is the lagged variable of the stock of domestic knowledge owned by country i, A^j is the stock of foreign knowledge available to j and is a matrix of market integration weighted by import shares[11] in the market integration estimation or a matrix of industrialization weighted by manufacturing value added in an economy in the industrialization estimation (see table 4). The use of import-share weighted sum of the foreign TFP imply that TFP spillovers potential benefits increase in imports. Given that TFP takes time to bear fruits, lagged variables are used to reflect the presence of a stock of knowledge in which past TFP still has a role even if it is decreasing in importance. The time lags are longer for the foreign than for the domestic TFP.

3.3 Data Sources

The study relied on the total economy website for the data on TFP; the WTO economic and research division for the data on distance between cities, the dummies on language, contiguity and land lockedness; and World Bank's World Development Indicators database for data on manufacturing value added, GDP and population. The data on import and exports is from COMTRADE. The data is in constant prices as shown in Table 3 in the appendix for a concise description of the data.

3.4 Estimation Procedure and Robustness Test

The study used Ordinary Least Squares (OLS) model to estimate the effects of COMESA on market integration and industrialization. The study introduces a fixed effect equation to account for country fixed effects or to capture country specific characteristics, which if not accounted for may introduce endogeneity in the estimation. To test for robustness to endogeneity, the study used the Durbin–Wu–Hausman test for endogeneity and obtained small p-value, which suggest that the OLS estimation is not consistent. To remedy this problem, we instrumented (2SLS) fitted values of the market integration and industrialization equation with geographical variables to account for endogeneity. In addition, the study also used the Ramsey Regression Equation Specification Error Test (RESET) to test for specification error in the OLS, fixed effects and 2SLS equation, the study finds no evidence that the OLS, fixed effects and 2SLS equations could have been miss-specified. The study also used Arrelano-Bond estimator, for dynamic panel to account for the mismatch between the time and cross-section dimension in the equations.

To estimate productivity equation, the study used the GLS estimator to pool each country and its trade partners. We then tested for unit roots and co-integration in the productivity equation before building an error correction mechanism (ECM frameworks).

4.0 Estimation Results and Discussion

4.1 Results of the market integration model

Table 4 in the appendix reports the estimation results. The table shows that the lag

11 The ratio of imports from j to i on total imports from all j's to i and/or on domestic GDP and/or on foreign GDP depending on the variable of interest

of market integration coefficient (0.3) is significant at 1 percent suggesting that the previous efforts and initiatives to integrate the markets have a strong impact on the future integration of the markets. Results suggest that COMESA market integration is partly through bilateral imports of goods, services and capital. The coefficient (3.46) on impact of bilateral COMESA membership is stronger than that of population, contiguity, GDP and common language. This implies that being a member of the COMESA REC increases the chances of member states to integrate their respective markets with each other.

These results lead to a possible conclusion that membership to a Regional Economic Community (REC) removes tariff and non-tariff barriers to trade to some extent. This suggests that the efforts put in place to facilitate trade in the COMESA region are bearing results of integrating the markets. This is in agreements with the results of other studies (see for example Krugman, 1980; Wanjala, 2004; Buigiut, 2012; Shinyekwa & Othieno, 2013) that have argued that regional integration creates large markets and promotes regional trade among partners.

The results also confirm that the COMESA Member States heavily trade with non-members, given that the coefficient (3.46) for unilateral COMESA membership is significant at 1 percent. Given that the region strives to industrialize, the composition of imports from outside the region is very critical. Importation of intermediate product is likely to have a positive effect compared to final products.

We notice that distance displays as expected a negative effect on the market integration although it is insignificant. This is however compensated for by the strong positive effect of member states having a common border. The strong impact of contiguity on market integration may also stress the importance of local features such as localized knowledge spillovers, local cultures, habits or tastes. This is in agreement with results of Garcia-del-Barrio, (2012) who argued that there are external economies of scale that provide an atmosphere of cross- pollination of ideas so that firms learn from each other and through competition generate efficiency in production.

4.2 Results of the industrialization model

Table 5 in the appendix reports the estimation results from the industrialization model that are similar to results in Table 4 but are relatively weaker outcomes in terms of statistical significance. It can be observed that the lag of industrialization coefficient (0.89) is significant at 1 percent suggesting that the previous efforts and initiatives to industrialize are likely to positively impact industrialization in the future which is intuitive.

The GDP of the importers has a positive and significant impact on industrialization as observed from the coefficient (0.26). This suggests that the higher the GDP the more the importer is likely to industrialize. The role of effective demand in spurring industrialization is critical for the COMESA region. This is related to the aspects of the quality of the population given that population of the importer is positive but not significant in the results. Therefore, a growing population is necessary but not sufficient to support industrialization if aspects of the quality of the population that determine effective demand are not addressed.

The results suggest that two countries belonging to COMESA and trading together have a high likelihood of industrializing, compared to when a COMESA Member State trades with a non-member states. The coefficient for bilateral COMESA membership is significant

at 1 percent compared to the one for unilateral membership which is positive and not significant. This is explained by the fact that whereas COMESA member states export to fellow members light manufactured products, they largely export primary commodities to non-members who are likely to be highly industrialized countries. Similarly, the region predominantly imports finished products from out of the region. The results suggest that fostering industrialization in the region will require growth in intra-COMESA trade. Owing to technology limitations, member states may not export manufactured products to especially industrialized countries who are the main importers of regional commodities.

The results are in agreement with Harris (1980) argument in favour of wider markets to support industrialization by use of tariffs. Accordingly, when markets are created this attracts new investments into the region generating an industrial base for the region.

4.3 Results of Productivity spill overs

Table 6 in the appendix reports the estimation results for productivity spillovers. The results reveal that the domestic and foreign stock of knowledge attributable to market integration and industrialization are both positive but insignificant implying that the share of foreign TFP to COMESA's TFP are weaker than expected suggesting non-convergence to international knowledge spillovers.

5.0 Conclusions and Policy Implications

The paper sought to establish the contribution of COMESA programmes in promoting market integration and industrialization, and the link between trade and productivity using spillovers in a multi-country model. The main findings of the study are that; membership to the COMESA REC has created large markets and promoted regional trade among partners suggesting that efforts put in place to facilitate trade such as removal of tariff and non-tariff barriers and other trade facilitation initiatives like infrastructure development among others, are bearing results of integrating the COMESA markets. We conclude that regional initiatives to integrate markets and industrialize are likely to positively impact industrialization in the future.

The results also confirm that COMESA Member States still heavily trade with non-members. Given that the region strives to industrialize the composition of imports from outside the region is very critical. Importation of intermediate product is likely to have a positive effect compared to final products. The results suggest that two countries belonging to COMESA and trading together have higher chances of industrialization compared to when a COMESA member states trades with a non-member state. This reflects the type of products traded in between COMESA member states and non-members states, which are largely imports of finished products. It is therefore, imperative that the COMESA region should further strengthen trade among its member states to foster industrialization.

The role of effective demand in spurring industrialization is critical for the COMESA region and is underscored by the results. However, it is concluded that although a fast-growing population is necessary, it is not sufficient to support industrialization if the quality of the population is not addressed. This implies that efforts to increase the quality of life and incomes of the population is necessary to increasing effective demand, needed to increasing trade and therefore industrialization.

Results demonstrate that domestic and foreign stock of knowledge attributable to market integration and industrialization are not significant. We conclude that the share of foreign TFP to COMESA's TFP are weaker than expected suggesting non-convergence to international knowledge spillovers.

In light of these findings the COMESA Member States should:

1. Continue furthering the policies that promote regional integration as enshrined in the treaty and promote infrastructure development and trade facilitation;

2. Implement the provisions of the regional and national industrialization policies and strategies;

3. Develop deliberate policies that support trade in intermediate products to support industrialization in the region; and

4. Encourage technology transfer and adoption into the region to reduce on importation of mainly finished products from outside the region.

5. COMESA member states should develop deliberate policies to ensure that their respective economies generate productivity spillovers both on the domestic and foreign fronts.

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Appendix

Table 1: Sectoral contribution to GDP for the combined COMESA Member states (1965 to 2020)

	1965	1975	1985	1995	2005	2015	2016	2017	2018	2019	2020	2020
Industry	24	24	22	21	25	24	25	24	24	24	24	26
Services	38	39	45	50	49	49	48	48	48	48	48	48
Agriculture	38	37	33	29	26	27	27	28	28	28	28	26
GDP (%)	100	100	100	100	100	100	100	100	100	100	100	100

Source: World Bank

Table 2: Manufactured exports (% of merchandise exports)

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Indonesia	56.4	54.4	52.1	50.5	47.2	44.7	42.9	38.8	40.6	37.5	34.2	36.2	37.8	-
Philippines	91.1	91.7	90.1	89.9	89.2	86.7	85.3	83.3	85.9	56.8	58.8	82.6	77.7	79.1
Singapore	84.7	84.8	84.8	83.7	81.1	79.5	76.4	70.4	74.2	73.1	68.7	69.8	70.6	71.3
Thailand	74.5	75.1	75.4	76.3	76.8	76.0	76.8	73.9	74.6	75.3	72.0	73.8	74.9	76.3
Vietnam	45.4	49.6	52.8	52.4	50.2	51.5	54.8	55.2	60.1	64.7	65.0	69.4	74.7	-
Burundi	0.8	1.9	6.4	5.1	6.2	1.3	31.3	18.1	20.6	5.9	12.7	12.9	19.8	24.2
Rwanda	2.7	23.8	4.3	3.8	3.4	3.3	4.5	6.7	16.6	7.6	10.5	10.2	9.5	12.3
Kenya	23.3	24.0	24.2	25.7	31.9	35.7	37.3	36.5	36.6	34.7			36.9	
Uganda	5.5	5.5	11.7	11.0	11.5	21.3	22.1	27.4	25.6	22.8	31.5	34.2	25.7	
Comoros	3.7	2.6	2.3	3.0	12.9	13.4	6.3	29.4	27.1		-	-	-	-
DRC	-	-	-	-	-	-	21	23	25	18	18	17	18	18
Egypt	32.7	35.4	31.0	30.5	23.6	21.2	18.8	36.5	43.8	43.4	45.1	45.5	48.7	51.5
Ethiopia	13.4	14.3	11.4	3.8	4.6	5.4	13.8	9.0	8.7	8.9	10.4	8.8	8.6	-
Malawi	10.2	11.8	11.5	15.4	16.3	12.9	10.5	10.0	8.5	9.0	9.0	-	7.5	-

Mauritius	74.2	72.6	73.6	68.1	57.3	64.1	61.9	57.3	64.2	60.2	64.5	61.7	58.7	62.5
Swaziland	48.5	76.4	75.5	51.0	71.5	63.9	69.8	-	-	-	-	-	-	-
Zambia	14.3	14.4	15.3	9.8	8.8	5.8	7.3	6.7	8.4	6.3	10.0	11.7	15.9	11.7
Zimbabwe	14.6	38.4	-	-	38.1	24.0	50.3	40.2	34.3	36.4	23.1	10.4	17.4	27.0

Data Source: WDI

Table 3: Description of data

Variable	Description	Obs.	Mean	Std. Dev.	Min	Max
Language	Common Language	555				
Border	Contiguity	555				
Landlocked	Landlocked	555				
TFP	Total Factor Productivity Growth	555	-0.3	19.1	-444.2	15.7
Unilateral COMESA Members (One in)	Trading partner (i) in COMESA	555				
Bilateral COMESA Members (Both in)	Trading partner (I and j) in COMESA	555				
None-in	Trading partner (I and j) not in COMESA	555				
(log of) Imports	As a measure of Market Integration	555	12.0	3.1	0	16.34
(Log of) Exports	Export	555	10.0	3.0	0	14.9
(log of) GDP	Annual Output of importer	555	15.9	9.9	4.7	30.0
(log of) Population	Population	555	16.7	2.1	11.3	26.4
(log of) Distance	Distance between Capital city i and j	555	7.7	1.1	5.70	9.51
(log of) Manufacturing Value Added (MVA)	Measure of Industrialization	555	20.2	7.3	0	28.9
T	Fitted vales of market integration and industrialization equation (Domestic or foreign Stock of Knowledge)	555	12.0	81.9	-149.3	140.6

Table 4: Impact of COMESA on Market Integration of Member State

Variable	OLS	Fixed effects	2 SLS	Arellano - Bond
Market Integration (-1)				0.30*** (0.06)
log GDP	0.11*** (0.05)	0.99*** (0.16)	0.99*** (0.16)	0.26*** (0.07)
Log Population	0.19* (0.10)	0.97*** (0.18)	0.96*** (0.18)	0.28*** (0.10)
Log Distance	-0.75*** (0.28)	-69.28 (63.45)	-43.10 (44.87)	-0.59 (0.68)
Unilateral COMESA Membership	1.36 *** (0.71)	1.24 (2.12)		3.46*** (1.00)
Bilateral COMESA Membership	1.96*** (0.95)	5.56*** (2.60)	4.32*** (1.50)	3.46** (1.39)
Common Language	0.06 (0.73)			0.88 (0.91)
Contiguity	0.70 (0.81)	0.46 (2.12)	0.46 (2.12)	4.22*** (1.62)
Constant		565.40 (499.)	359.02 (352.13)	8.57 (5.24)
Observations	556	555	555	518
Wald chi^2	1600.02		19132.59	97.97
F Stat		8.35		

****** 1 percent, ** 5 percent, * 10 percent***

Table 5: Impact of COMESA on Industrialization of Member state

Variable	OLS	Fixed effects	2 SLS	Arellano - Bond
Industrialization (-1)				0.89*** (0.05)
log GDP	0.12 (0.12)	0.64* (0.36)	0.64* (0.36)	0.26*** (0.07)
Log Population	0.32 (0.23)	0.65 (0.41)	0.65 (0.41)	0.41 (0.24)
Log Distance	-1.44* (0.70)	-28.83 (142.45)	-24.52 (100.73)	-0.40 (2.07)
Unilateral COMESA Membership	3.02* (1.79)	0.20 (4.76)		1.64 (3.21)
Bilateral COMESA Membership	2.53 (2.40)	9.72* (5.83)	9.92*** (3.36)	9.13*** (3.45)
Common Language	1.94 (1.94)			0.70 (3.81)
Contiguity	0.80 (2.07)	-8.94 (4.76)	8.94* (4.76)	4.17 (3.24)
Constant		-181.45 (1120.62)	-147.47 (790.53)	10.30 (15.83)
Observations	555	555	555	518
Wald chi^2	636.96		10715.01	565.04
F Stat		2.69		

****** 1 percent, ** 5 percent, * 10 percent***

Table 6 Impact of Market Integration and Industry on TFP growth

Variables	Market Integration led productivity	Industrial led productivity
(T) Domestic Stock of Knowledge (TFP)	0.01(0.03)	0.02 (0.07)
(T) Foreign Stock of Knowledge (TFP)	0.03 (0.02)	0.02 (0.01)
Constant	0.48 (0.90)	0.70 (1.71)
Observations	553	553
F Stat	1.33	1.32

Effect of Regional Integration on Intra-COMESA Foreign Direct Investment: **Empirical Evidence**

Duncan O. Ouma

ABSTRACT

This study investigated the effect of Regional Integration on Foreign Direct Investment in COMESA using the gravity model. The gravity equation was estimated using the Pseudo Poisson Maximum Likelihood technique. The findings show that the various proxies for economic, monetary, political, physical and social integration have significant impact on FDI flows. Regression results further show that membership to COMESA has positive and significant effect on FDI flows. This study therefore concludes that regional integration has a positive and significant impact on the intra-COMESA FDI flows.

Key Words: Regional Integration, Foreign Direct Investment, COMESA.

1.0 INTRODUCTION

Regional integrations (RIs) are known to advance the cause of trade liberalization and lead to freer markets by reducing or eliminating tariffs and some non-tariff trade barriers among Member States, even though at the risk of diverting trade away from non-Member States (Vollrath, 1998). RIs have both positive and negative effects on different kinds of monetary transactions between countries depending on how they are designed and implemented as well as enhancing social ties between and among the member states. Recent literatures have also linked Regional Integration Arrangements (RIAs) to flow and stock of Foreign Direct Investment (FDI) within the region.

According to UNCTAD 2015 World Investment Report, FDI flows account for more than 40 per cent of external development finance to developing and transition economies. Inward FDI flows to developing economies were at the peak in 2014 at $681 billion, reflecting a 2 per cent rise while in developed countries it declined by 28 per cent to US$499 billion. The inward FDI to Africa remained unchanged at US$54 billion in 2014.

The effect of RI on the direction and level of FDI flows can take different channels, and not all of them go in the same direction. According to Duade, Levy and Stein (2002), the impact depends on the reasons that bring about foreign investment in a particular country. For instance, a firm may invest abroad in order to exploit a highly protected domestic market, thus serving through sales of a foreign affiliate a market that it could serve through trade only at a high cost. Alternatively, it may invest abroad following a strategy of international vertical integration, exploiting differences in comparative advantage for different stages of production of a given good. In this case, depending on the motive for foreign investment, the formation of trading blocs may have completely different implications for the direction of FDI flow.

According the 2013 COMESA Investment Report, the region continues to be an attractive investment destination. This is evidenced by the overall growth rate of 86 per cent in inward foreign direct investment (FDI) in 2012. This was a major recovery from the low performance of 2011, despite the declines in global inward FDI flows in 2012 which were attributed to uncertainty particularly in the Eurozone area and a weak macroeconomic environment in advanced economies. The 2012 performance was attributed to mainly to countries like Uganda, Democratic Republic of Congo, Madagascar and Egypt, which experienced high levels if inward FDI increases. According to COMSTAT statistic, the inward FDI flow in COMESA further increased by 21 per cent in 2015. On the other hand, the outflow FDI remains very low in COMESA, and with a fluctuating trend.

The overall objective of the study was to investigate the effect of Regional Integration on Foreign Direct Investment in COMESA. The study focused on Intra-COMESA flows of FDI in relation to the regional integration. Based on availability of bilateral FDI data, the study investigated the effects of RI on FDI inflow from Kenya to selected COMESA Member States and a few non-members. The specific objective was to determine the effect of various forms of regional integration on Intra-COMESA FDI. This included effect of monetary, political, physical, economic and social integration on intra-COMESA FDI.

2.0 REVIEW OF THE LITERATURE

The traditional theory of FDI explains why firms produce abroad instead of producing at home and exporting to the markets abroad despite the additional costs and risks that come with producing abroad. Dunning (1977, 1981) introduced Ownership, Location and Internalization (OLI) framework which describes the advantages which the Multi-National Corporations (MNC) holds over the foreign producers. The basic argument is that when these advantages outweigh the costs, firms choose to produce abroad and FDI arises. The ownership advantage includes a product or a production process to which other firms do not have access, such as a patent, blueprint or trade secret, to more intangible advantages such as reputation for quality. While the location advantage stems directly from the foreign market, such as low factor prices or customer access, together with trade barriers or transport costs that make FDI more profitable than exporting.

On the other hand, the internalization advantage is derived from the firm's interest in maintaining its knowledge assets internally such as highly skilled workers who know the firm's technology, (Di Mauro, 2000). Other arguments for preference of FDI over exporting (or licensing) may include; informational asymmetries such as better knowledge of the domestic market by the licensee (which may lead to take over) and advantages derived from the reduction of transaction costs (for contracting, quality assurance, etc.) that arise in case of licensing. The OLI framework however fails to explain the existence of horizontal FDI and to provide a reliable empirical model.

The New Theory of FDI builds on the traditional theory by referring mainly to the ownership and location advantage, and introducing the MNCs in general equilibrium models. Helpman (1984) and Helpman and Krugman (1985) derive the activity of MNCs by trying to explain intra-firm trade. The models are based on two main assumptions: product differentiation and economies of scale, and firm inputs that behave like public goods (that is, inputs such as management, marketing, R&D, that are specific to the firm and that can be easily transferred from one plant to another, at virtually no cost).

Moreover, it is assumed that transport costs are zero and the MNCs will split their production process between a 'headquarter' activity, often skill or capital-intensive, and the plant production abroad. This implies that factor proportions in home and foreign activities differ. This can be referred to as vertical FDI since firms separate their production process in order to take advantage of factor price differentials across countries.

Duning (1997) analyzed empirical findings regarding the effects of the formation of the Internal Market Programme (IMP) in Europe largely on the basis of econometric studies. He found that the main dynamic impact of the FDI is through the effects on other determinants of FDI, such as market size, income levels, structure of activity and agglomeration economies. IMP as an independent variable raised extra- and to a lesser extent intra-regional FDI but not by as much as other variables. The effects of the IMP were industry specific, with extra-EC FDI increasing more in FDI sensitive sector. There was limited evidence that economic activity has become geographically concentrated as a result of the IMP, although high value-added activities remained clustered and lower value activities became more dispersed. Finally, there was complementarily between trade and FDI.

Velde, Willem and Bezemer (2006) investigated the relationship between RI and FDI in developing countries. The study aimed at bringing together the descriptive and the econometric approaches to conduct empirical research that could help to identify the effects of specific investment-related provisions in RTAs on FDI. It estimated a model explaining the real stock of UK and US FDI in developing countries, covering more developing countries than contained in the OECD database often used for such analyses, over the period 1980–2001. They found membership to regional integration leads to further extra regional FDI inflows depending on the regional provisions, and that the position of countries within a region also determines the destination of FDI flows.

Salike (2010) analyzed the relationships between RIA and FDI from theoretical point of view. Using a cross-sectional tabulation framework, the study found that the main motives of multinational firms investing abroad within the RIA were tariff-jumping and internationalization. Looking at the conduct and pattern of FDI prior to formation of RIA and the effect of RIA on the intra-regional FDI, the study found that tariff jumping reduces

horizontal FDI but has no effect on the vertical FDI, while internalization increases vertical FDI and has a mixed effect on the horizontal FDI. Additionally, it was found that both tariff jumping and internationalization increase inter-regional FDI on both vertical and horizontal modes. Based on the analysis of the attractiveness matrix the study further found that the flow of FDI depends on the consequences of environmental change and locational advantage of the recipient countries within the region. The inflows of FDI from "outsiders" into the region would go up if the average level of protection increases as a result of the RIAs, or if the establishment of a RIA raises fears about future protection. This could be due to market enlargement that comes as a result of the establishment of the RIA. The study therefore concluded that in general, formation of RIA leads to increase in inflow of FDI in integrated region, and that FDI distribution is not even in the participating countries after the formation of RIA. This study is however limited due to its theoretical approach and fails to provide empirical evidence of the effect of RIA on intra-regional and inter-regional FDI flows.

3.0 METHODOLOGY

In order to synthesize both the horizontal FDI and vertical FDI approaches, a simple gravity model was specified including the following variables; relative factor endowments, an index of countries' similarity in size, geographic distance between the partner countries and a measure of the economic space between the two countries as given by the sum of the two GDPs. Additional variables, such as a common language, a common border, or preferential trade agreements, that may reduce the costs of locating abroad, were introduced via dummy variables. Given the similarities between FDI and international trade, gravity model applied in trade can be employed to estimate bilateral FDI flows (see Brenton and Di Mauro, 1999; Levy, Stein and Duade, 2003; Velde *et.al*., 2006).

3.1 Model Specification

Following the work of Di Mauro (2000), the gravity model specified in this study takes the following form:

$$\ln FDI_{ij} = \alpha + \beta_1 \ln\left(GDP_i + GDP_j\right) + \beta_2\left[\ln\left[1 - \left(\frac{GDP_i}{GDP_i + GDP_j}\right)^2 - \left(\frac{GDP_j}{GDP_i + GDP_j}\right)^2\right]\right]$$

$$+ \beta_3\left[\ln\frac{GDP_i}{PoP_i} - \ln\frac{GDP_j}{PoP_j}\right] + \beta_4 DIST_{ij} + \sum_{k=1}^{n}\pi_k D_{kij} + \varepsilon_{ij} \ldots\ldots(1)$$

Let's denote the terms in equation 1 as follows;

$$S\_GDP_{ijt} = \ln(GDP_{it} + GDP_{jt}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(a)$$

$$S\_SIZE_{ijt} = \ln\left[1 - \left(\frac{GDP_{it}}{GDP_{it} + GDP_{jt}}\right)^2 - \left(\frac{GDP_{jt}}{GDP_{it} + GDP_{jt}}\right)^2\right] \ldots\ldots\ldots\ldots\ldots\ldots(b)$$

$$R\_END_{ijt} = \left[\ln\frac{GDP_{it}}{PoP_{it}} - \ln\frac{GDP_{jt}}{PoP_{jt}}\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(c)$$

Substituting (a), (b) and (c) into (1), we obtain;

$$\ln FDI_{ijt} = \alpha + \beta_1 S\_GDP_{ijt} + \beta_2 S\_SIZE_{ijt} + \beta_3 R\_END_{ijt} + \beta_4 DIST_{ijt} + \sum_{k=1}^{n} \pi_k D_{kijt} + \varepsilon_{ijt} \ldots\ldots\ldots\ldots\ldots(2)$$

FDI_{ijt} is the Foreign Direct Investment from country i (home country) to country *j* (host).

S_GDP_{ijt} is the sum of the GDP of country i and j.

S_SIZE_{ij} is the index of size similarity.

R_END_{ijt} is the differences in relative endowments between countries i and j.

$DIST_{ijt}$ is the relative distance between countries i and j.

D_{kijt} are dummy variables (assuming n country dummies) and other indicators of integration.

ε_{ijt} is the error term.

To be able to capture the effect of regional integration on FDI, we obtain the breakdown of the last term of equation 2 into the indicators of integrations such as exchange rate variability (ERV), membership to COMESA (COMESA) and membership to EAC (EAC); and dummies such as common border (CB) and common language (CL). Equation 2 can therefore be re-written as;

$$\ln FDI_{ijt} = \alpha + \beta_1 S\_GDP_{ijt} + \beta_2 S\_SIZE_{ijt} + \beta_3 R\_END_{ijt} + \beta_4 DIST_{ijt} + \beta_5 ERV_{ijt}$$

$$+ \beta_6 COMESA_{ijt} + \beta_7 EAC_{ijt} + \beta_8 CB_{ij} + \beta_9 CL_{ij} + \varepsilon_{ijt} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

The model can be further augmented by addition of corruption perception index (CPI) as a measure of political integration or business environment friendliness. Equation 3

becomes;

$$\ln FDI_{ijt} = \alpha + \beta_1 S\_GDP_{ijt} + \beta_2 S\_SIZE_{ijt} + \beta_3 R\_END_{ijt} + \beta_4 DIST_{ijt} + \beta_5 ERV_{ijt}$$

$$+ \beta_6 COMESA_{ijt} + \beta_7 EAC_{ijt} + \beta_8 CB_{ij} + \beta_9 CL_{ij} + \beta_{10} CPI + \varepsilon_{ijt} \ldots\ldots (4)$$

Looking at the dataset, there are several observations where FDI stocks or flows are zero, which would be dropped by taking logs. The problem of the zero variables is common when estimating a gravity equation, and there are several ways of dealing with it. In this study, the suggestion by Eichengreen and Irwin (1995, 1997) who proposed a simple transformation to deal with the zeros problem was adopted. Instead of working with ln FDI, they propose working with ln (1 + FDI) as the dependent variable. This still allows us to interpret the coefficients elasticities, and be able to obtain a value even where FDI is zero. Additionally, the value of ln (1+ FDI) is approximately equal to the value of ln FDI.

Subsequently, the following equation was estimated to determine the effects of various forms of regional integration on the intra-COMESA FDI;

$$\ln(1 + FDI_{ijt}) = \alpha + \beta_1 S\_GDP_{ijt} + \beta_2 S\_SIZE_{ijt} + \beta_3 R\_END_{ijt} + \beta_4 DIST_{ijt} + \beta_5 ERV_{ijt}$$

$$+ \beta_6 COMESA_{ijt} + \beta_7 EAC_{ijt} + \beta_8 CB_{ij} + \beta_9 CL_{ij} + \beta_{10} CPI + \varepsilon_{ijt} \ldots\ldots (5)$$

Where the exchange rate variability (ERV) is computed as follows;

$$EVR_{ijt} = \frac{\ln ER_{ijt}^{Max} - \ln ER_{ijt}^{Min}}{\ln ER_{ijt}^{Min}} \ldots\ldots (6)$$

Where;

R_{ijt}^{Max} is the maximum monthly exchange rate between country i and j in year t.

R_{ijt}^{Min} is the minimum monthly exchange rate between country i and j in year t.

3.2 Description and Measurements of Variables

The variables included in the empirical model specified in the previous section were motivated by the theories of FDI and the empirical literature. Table 3.1 presents brief description and measurements of the variables.

Table 3.1: Description and Measurement of Variables

VARIABLE	DESCRIPTION/DEFINITION	MEASUREMENT	EXPECTED SIGN
Foreign Direct Investment (**FDI)**	The total flow of investment (control of ownership) from one country to another.	Millions, USD in a given year.	N/A
Sum of the GDP (**S_GDP)**	The sum of the GDPs of the source and recipient countries, as a measure of the economic space between the two countries.	Constant price, Billions, USD in a given year.	Positive
Size similarity (**S_SIZE)**	Countries' similarity in size, computed as in equation (b).	An index which ranges between 0 and 0.5. (Numeric)	Positive
Relative Endowments (**R_END)**	Differences in relative endowments as proxied by the difference in GDP per capita of the source and recipient countries.	Constant price, USD in a given year.	Positive
Distance (**DIST)**	Distance between the economic centers of the countries.	Thousands, Kilometers (KM)	Negative
Exchange Rate Variability (**ERV**)	The nominal bilateral exchange rate between the two countries, computed as in equation (6).	Percentages	Negative
Corruption Perception Index (**CPI**)	Corruption perception index is a proxy for political integration.	Index, numeric	Positive
Regional Integration (**COMESA**)	A dummy that membership to COMESA	1 for common membership, 0 otherwise.	Positive
Regional Integration (**EAC**)	A dummy that membership to EAC	1 for common membership, 0 otherwise.	Positive

Common Border (**CB**)	A dummy that captures transaction costs between the countries.	1 for common border, 0 otherwise.	Positive
Common Language (**CL**)	A dummy that captures social ties between the countries.	1 for common language, 0 otherwise.	Positive

3.4 Data Types and Sources

The study used annual secondary data covering the period 2000 – 2015. The data was sourced from various databases and publications including COMSTAT Data Portal, Transparency International (TI) database, International Financial Statistics (IFS), Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) and World Development Indicators (WDI).

4.0 ESTIMATION RESULTS

4.1 Diagnostic Tests Results

To determine the appropriate models and estimation procedures, several diagnostic tests, including unit root tests, test for cointegration and Hausman test were carried out. Other precautionary tests carried out included the test for correlation and good fit test.

The panel root test was performed to investigate if there was any variable that was non-stationary. The Im-Peseran-Shin panel unit-root test developed by Im, Pesaran and Shin (1997) was adopted in this study. The Im-Pesaran-Shin panel unit root test hypotheses are as follows;

Ho: All panels contain unit root

Ha: Some panels are stationary

The results of the unit-root test presented in Table 4.1 showed the rejection of null hypothesis for FDI (which was the dependent variable in the study) at five per cent level of significance and for exchange rate variability (ERV) at one per cent level of significance at levels. On the contrary, the rest of the variables were non-stationary at levels, implying the presence of unit root. However, all the variables became stationary upon first differencing. The variables were found to be cointegrated. This implies that an error correction model (ECM) can be specified with the dependent variable, exchange rate variability, distance and the dummies at levels, while the rest of the independent

variables at first difference. The gravity equation was therefore estimated using the Pseudo Poisson Maximum Likelihood (PPML) technique.

Table 4.1: Results for unit-root test (Im-Peseran-Shin panel unit-root test)

Variable	*t-bar statistic*		
	Levels	*First Difference*	*Levels with time trend*
Ln FDI	-2.2408**	-2.8657***	-2.5013***
Ln S_GDP	5.3208	-2.6462***	-2.3099**
Ln S_SIZE	0.7585	-2.2221**	-1.2718
Ln R_END	0.5395	-2.1506**	-1.2244
Ln ERV	-2.7237***	-3.3783***	-2.6464***
Ln CPI	1.1601	-2.2999**	-0.2874

*** and ** denote rejection of the null hypothesis at 1% and 5% levels of significant, respectively.

Relative endowment was found to be highly correlated with distance, sum of GDP and corruption perception index. As a result, this variable was dropped from the study. Common border (CB) was also dropped from the model for being highly correlated with EAC. To help in determining the most appropriate model between random effects model (REM) and fixed effects model (FEM) Hausman test was carried out. The Hausman test results show rejection of the null hypothesis of "no systematic difference in random and fixed effects coefficients" for all the data sets, implying that the REM was most suitable for the study.

4.2 Empirical Results

The study aimed at investigating the impact of Regional Integration and Foreign Direct Investment in COMESA using a gravity model. Regional integration was captured by variables such as; membership to regional blocs, corruption perception index and exchange rate variability. The augmented gravity model specified in equations (5) was estimated using the PPML technique in panel data. The regression results are presented in Table 4.2.

Table 4.2: Regression Results (Dependent Variable: Foreign Direct Investment)

Variable	*Coefficients*	*P – value*
SUM OF GROSS DOMESTIC PRODUCT	6.8915	0.269
SIZE SIMILARITY	24.4125**	0.022
EXCHANGE RATE VARIABILITY	-0.6365***	0.000
CORRUPTION PERCEPTION INDEX	7.1945**	0.016
COMESA	0.3237***	0.002
EAC	0.2831**	0.000
DISTANCE	0.0008***	0.003
COMMON LANGUAGE	0.0318**	0.022
Constant	4.8036	0.110
No. of Observations	55	
Pseudo R^2	0.2981	
Pseudo log-likelihood	-75.4997	

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

The equation has generally performed well with pseudo R^2 of 0.2981 for a panel data analysis. The coefficients of all the variables are statistically significant except for the sum of the GDPs. All the coefficients have the expected signs except for Distance. The results show that the size similarity variable has a positive and significant impact on FDI flows, confirming that FDI flows in COMESA is driven by countries similarity as suggested by the New Theories of FDI. Exchange rate variability (ERV) has the expected negative and significant impact on FDI, implying that high exchange variability within COMESA is a bad thing for FDI flows. ERV is considered as one of the measures of monetary integration.

The coefficient of corruption perception index (CPI), which measures business friendliness of a country and therefore proxy for political integration also has the expected positive sign and is statistically significant at 5 per cent. This implies that political integration, as proxied by CPI increases the FDI flow by 7.19 per cent. However, Distance has the unexpected positive sign which is highly significant at 1 per cent, but the magnitude of the coefficient is too small (0.0008) implying that the distance between the economic centers of the country, used as a proxy for physical integration, has very little impact on the flow of FDI and may discourage production abroad in favor of exportation. This could be partly explained by the fact that firms would prefer to set up production units abroad only if the cost of transport is significantly high, as measured by the distance.

Additionally, the regression results show that membership to COMESA and EAC regional blocs have positive and significant effect on the FDI flows. The coefficient of dummy variable for COMESA is positive (0.3237) and statistically significant at 5 per cent level of significance, while that of EAC is also positive (0.2831) and statistically significant at 1 per cent level of significance. These imply that there is a 32.37 percentage effect on Kenyan FDI outflow to COMESA and 28.31 per cent to EAC as a result of being a member of the regional blocks.

The results on COMESA and EAC memberships imply that a wider integration in the region or in Africa would translate into better prospects for intra-regional FDI flows. Furthermore, common language between two countries also has a positive and significant impact on the FDI flows between the countries. Common language can be interpreted to imply the level of social integration between the countries. In this study, English was considered as the official language and the language of business in Kenya. The results show that sharing a common official language increases FDI flows between the countries by about 3.18 per cent.

5.0 CONCLUSION AND POLICY IMPLICATIONS

As evident in the literature reviewed, the relation between RIA and FDI depends on a number of economic, social political factors. Based on the findings this study concludes that regional integration has a positive and significant impact on the intra-COMESA FDI flows. Economic, political, monetary and social forms of integration as proxied by the regional blocs, corruption perception index, exchange rate variability and common language respectively, have the expected (positive or negative) impact on FDI flows. Investors tend to establish and produce in countries where there exists some form of integration with their own country. The study also concludes that the form of FDI flows in COMESA is mainly horizontal in nature as the coefficient of size similarity is found to be positive and significant.

This study therefore recommends that COMESA Members States should put more emphasis on deepening integration as a mechanism of promoting intra-COMESA FDI flows. Such measures should focus on all aspects of integration such as economic, monetary, political and social integration. Specifically, policies aimed at exchange rate stabilization, elimination of corruption, tightening social ties in the region would go a long way in promoting intra-regional FDI flows.

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IMPACT OF BORDER DELAYS AND COSTS ON COMESA CROSS BORDER TRADE

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Abstract

The study estimated the impact of cross border costs and delays on cross border trade in COMESA using a gravity model on cross sectional data for 16 Member States. The study found that a 1% increase in border delays by both importing and exporting countries reduce bilateral annual export flows by approximately US$2 million while a 1% increase in border delays by exporting and importing country reduces annual bilateral COMESA exports by approximately US$700 000 and US$ 1.3 million respectively. The study further found that unilateral/national reforms to reduce border delays induced less trade flows relative to bilateral initiatives while trade facilitation reforms implemented jointly reduced border delays considerably. The study recommends that COMESA Member States should consider bilateral or regional approaches to border management such as establishment of one stop border posts, cross-border interfacing of systems, integrated risk management, regional integrated single window systems and mutual recognition of Authorized Economic Operators (AEOs).

1.0 Introduction

Since 2000, trade agreements have been taken as a key tool to achieve integration and more trade. There has been an increase in trade agreements from just below 150 in force in 2005 to more than 290 in force in 2015, (UNCTAD, 2016b). However, trade under these agreements did not experience a similar increase. In 2015, 50% of the 2015 global trade flows took place under some form of trade agreements. In Europe, more than 50% of trade is carried out under agreements that go beyond the traditional tariff reduction and the WTO agreement to factors behind the borders. In COMESA, only 15% of members conducted 50% to 75% of their trade through regional trade agreements while the rest traded below 50% of their trade under regional agreement. Of these, 36% had below 25% trade under a regional agreement, (UNCTAD, 2016b), as shown in Table 1. This shows that COMESA member states trade more outside the regional trade agreement (Barka, 2012).

Table 1: Importance of Trade Agreements as Measured by trade volume under agreements for selected COMESA Member States.

Category	Trade Volume under trade agreement				
	50% to 75%	**25% to 50%**	**10% to 25%**	**< than 10%**	**No data**
Very important	Egypt, Swaziland and Zimbabwe				
Important		Burundi, Malawi, Madagascar, Rwanda, Sudan and Zambia			
Relatively important			Kenya, Libya, Uganda		
Not important				Ethiopia, Eritrea, DRC, Djibouti	
No data					South Sudan

Source: Compiled by the Author, data obtained from UNCTAD (2016b).

There are arguments that trading outside Africa is cheaper relative to trading within. For example, during the launch of Move Africa in Rwanda, in 2016, it was argued that it is easier and cheaper for Coca-Cola to buy passion fruit from China, move it to Kenya, bottle and sell it in Kenya than to buy it from the next-door Uganda. Long border waiting times and high costs of complying with border formalities are presented to be the major drivers of trade transaction costs in Africa.

1.2 Background to the Study

The changing landscape of international trade, characterized by declining financial returns to traders due to falling commodity prices[14] demands high operational efficiency and competitiveness. The search for efficiency and competitiveness saw the emergency of global value chains with trade in intermediate products reaching 44% of total global trade in 2015, (UNCTAD, 2016a). The increased participation in global value chains means commodities cross many borders before they become final goods. This development implies that any increase in border crossing times or costs will have serious trade impact. Border delays affect cross border trade in various channels.

1.2 1 Border Delays and their Sources

There are a number of factors that induce delays at border posts. According to the Economic Commission for Africa (2012), Barka (2012), OSCE (2012), SAIIA (2014) and Willie & Chikabwi (2017), the following are the common cause of delays at border posts in Africa:

* Border agency multiplicity;
* Inadequate border infrastructure;
* Complex procedures;
* Unsynchronized border working hours for example at Moyale Border Post between Kenya and Ethiopia;
* Different operating hours of borders along the same corridor for example North South Corridor, Beitbridge Border operates 24 hours, Chirundu OSBP operates from 6am to 10pm and Kasumbalesa border operates from 6am to 6pm;
* Frequent power cuts and internet failures have also been observed as common sources of border delays in Africa, (AEN, 2016);
* Fixed time schedule for Physical Examinations for example at Dedza Border Post in Malawi;
* Insufficient or late payment of duty and taxes;
* Escorts;
* Multiple fees payment points; and
* Corruption and errors in declarations.

14 International trade value declined by 10% in 2015 due to declining commodity prices.

1.2.2 Border Costs and their Sources

Costs incurred at border posts can be categorized into two forms. Direct costs, which are official charges for the service rendered and the indirect costs which are delay induced costs. Direct costs at border posts include payments to clearing agents for framing declaration documents, customs service fees, bond fees, and statutory payments in compliance with other government agencies' formalities. Willie & Chikabwi (2017) established an average cost of US$486 to cross Forbes Border Post from Mozambique to Zimbabwe. It has been established that costs can also be exacerbated by participation of private sector in provision and management of border infrastructure. For example, the private operator at Kasumbalesa charges US$33 per axle to cross the Zambian side and US$100 to cross the DRC side of the border. Besides direct costs, complex procedures and delays at the border induce costs to traders. These include costs of holding too much stock, driver upkeep expenses, demurrage and cost of spoilage in case of perishables.

1.2.3 Border Crossing Costs, Delays and Intraregional Trade

Border delays affect intraregional trade in various channels. Delays lead to higher transport costs which are passed on to traders in the form of high transport prices, (Teravaninthorn & Raballand, 2009). Demurrage fees, driver subsistence, unofficial payments to seek quick passage are examples of delay induced costs passed on to traders in the form of high transport prices. African borders are mostly served by medium to small logistics companies with limited capacity to furnish many bonds at once. Thus, delaying a truck at the border imply reducing the volume of business for clearing agencies and this could be reflected in high bond fees, (Fitzmaurice, 2016). The overall effect is increase in trade transaction costs which negatively affect trade flows.

On the other hand, delays induce unreliability in the supply chain. This reduces flexibility of traders to satisfy varying customer demands. Thus, traders opt to holding high levels of stock to hedge against delivery delays, an option that increases production costs. Besides, unpredictability of supply chain hinders producers from participating in high value global supply chains. In general, border delays affect international competitiveness of an economy's products, (OCC, 2004).

Direct costs incurred at the border in complying with statutory requirement have similar effect as border delays on intraregional trade. Trade facilitation reforms to reduce border delays and costs compliment tariff concessions in promoting intraregional trade in Africa. Table 2 shows selected reforms implemented by COMESA countries to reduce border delays and costs. The reforms are either nationally or regionally implemented. The reviewed literature has indicated that trade facilitation reforms to reduce costs and delays are more effective when implemented regionally relative to nationally (UN-OHRLLS, 2016).

Table 2: Selected reforms implemented by COMESA countries to reduce border delays and costs.

#	Initiative/reform	Implementing country and the approach	
		National/unilateral approach	**Regional/bilateral approach**
1	Bond/guarantee system	Zimbabwe, Zambia, DRC, and Malawi	Kenya, Uganda, Rwanda
2	electronic cargo tracking systems	Zimbabwe	Kenya, Uganda, Rwanda
3	COMESA Yellow Card		Burundi, DR Congo, Djibouti, Eritrea, Ethiopia, Kenya, Malawi, Rwanda, Sudan, Uganda, Zambia, Zimbabwe
4	One Stop Border Posts		Zimbabwe, Zambia, Rwanda, Kenya, Uganda etc.
5	Automation (ASYCUDA World or other)	Zimbabwe, Zambia, Malawi, DRC	Uganda, Rwanda, Kenya, Burundi
6	Single Window System	Malawi, DRC, Kenya, Rwanda, Uganda	
7	Risk Management	Zimbabwe, Zambia, Malawi, DRC	Uganda, Rwanda, Kenya
8	Authorized Economic Operators (AEOs) Programmes	Zimbabwe and Zambia	Uganda, Rwanda, Kenya
9	Centralized clearance		Uganda, Rwanda, Kenya (under Single Customs Territory)
10	Pre-clearance	Zimbabwe, now mandatory in Zambia	Uganda, Rwanda, Kenya
11	Harmonization of Regulations	Zimbabwe (work in progress under ease of doing business reforms)	East African Community with USAID Assistance

1.3 Problem Statement

COMESA, like other regional economic communities in Africa have very low intra-regional trade which makes it susceptible to international shocks. Tariffs have been considerably reduced to stimulate intra-COMESA trade, (Otsuki, 2011; Azharia et al., 2011), unfortunately with very limited success. COMESA countries are now focusing on policy instruments outside the tariff box to stimulate intra-trade. Border management reforms have taken centre stage. These reforms are undertaken either unilateral, bilateral or regionally, targeting to reduce border crossing time and costs. Whilst reducing border crossing time and costs are critical outputs of the border management reforms, they do not show the policy outcome of whether the reform will result in increasing intra-COMESA trade. This higher-level impact of border management reforms is indispensable in building a business case to get political will. Thus, this paper seeks to generate evidence

on how much intra-trade is lost due to costs and delays at border posts in COMESA Member States.

1.4 Objectives of the Study

The general objective of the study is to estimate the impact of long border crossing times and costs on intra-COMESA trade. We seek to demonstrate in monetary terms how much intra-COMESA trade is lost due to border crossing costs and delays to justify the need for border management reforms in COMESA Member States.

Specifically, the study will:

a) Estimate the quantum of trade that is lost due to border crossing delays and costs; and

b) Determine which border reform implementation strategy, (unilateral, bilateral/regional strategy) is most efficient in stimulating intra-COMESA trade.

2.0 Review of the Literature

International trade business always involves the use of intermediaries who provide information and other services between buyers and sellers so that exchange of goods take place. An efficient trading environment reduces trade transaction cost and higher transaction cost reduces trade flows. This has been explained in the iceberg theory which postulates that a portion of goods traded pay transaction costs. Thus, high transaction costs reduce trade volume by higher margin (Hewitt & Gillson, 2003). At border posts, transaction fees are paid to customs, other government agencies, and clearing agencies for clearance services. Delays in the provision of clearing services will induce further costs with the same effect of reducing trade volumes.

The impact of delays or transit time and transaction costs on cross border trade flows have been interrogated by numerous empirical studies across the globe. Using a gravity model analysis of Mongolia trade patterns, Vorshilov & Ulzii-Ochir (2016) established that trade transaction costs have a negative impact on trade flows. Vidavong (n.d) also analysed the impact of trade transaction cost on Laos exports using the gravity model and found that a 1% increase in trade costs will reduce Laos exports by 0.99%. The same argument has been authenticated by Akbar, et al. (2013) who established a negative impact of trade costs on Bangladesh's exports. Again, Akbar, et al. (2013) used gravity model as the tool of analysis.

Studies have also established that transit times have a negative impact on trade flows. Ansón, et al., (2017) using the gravity model analysed the impact of time on trade flows for both developed and developing countries and established three key findings. The first finding was that an extra day spent in transit reduce export volume by about 1%. The second finding was that transit time effect on trade volumes vary from one place to another and from one commodity to another. They are most pronounced in developing countries relative to developed countries. Perishables and intermediated products are more time sensitive relative to other finished industrial goods. Lastly, they found that supply chain unreliability induced by transit time which cause firms to hold high levels of inventories reduce trade by more than 1%. Their findings are in agreement with the United States of America study by Clark, et al., (2013) who established that a 10% increase in transit time induced uncertainty and reduced trade by 3%.

Vorshilov & Ulzii-Ochir, (2016), included a variable that captured border crosing time in their model and established that a 1% increase in border crossing time reduced Mongolia's exports by 0.89%.

The empirical literature clearly shows that transit time and trade transaction costs have a negative impact on trade flows. The gravity model has been the major tool of analysis. However, variables of varying scope were used to proxy transit time and trade transaction costs. Literature reviewed in this paper proxied transit time by time to export/import. This variable indicate the time from origin to destination of goods. Only Vorshilov & Ulzii-Ochir, (2016) included a time variable capturing the time to cross a border. Similarly, trade costs variables that cover the whole supply chain were used in empirical analysis. With these aggregate time and cost variables it is difficult to advice on a reform policy targeted at a border post which is the focus of our study. While the previous studies provided a policy direction, the analysis could not be lowered down to a single unit such as a border due to lack of data.

3.0 Methodology

To understand the impact of border delays and costs on COMESA cross border trade we first employed the gravity model of trade analysis followed by simulation method. The simulation method relied on trade elasticities of time and cost generated through the gravity model, time and cost data generated by Time Release Surveys (TRS) and Time-Cost Distance (TCD) models conducted in various border posts in COMESA member states.

3.1 The gravity model

Following Silva and Tenreyro (2006), our empirical model is specified as followsWhere

$$T_{ij} = \exp\left(\beta_i X_{ij} + \varphi_i Y_{ij}\right) + \mu_i \quad (1)$$

T_{ij} represents trade flow (exports or imports) from country *i* to country *j*. X_{ij} is a vector of traditional gravity variables that include GDP of the exporter and importer, common border, common official language, land locked and common colonizer.

Y_{ij} is a vector of our variables of interest (the costs and time to comply with border crossing formalities for both the exporter and the importer). B_i and Q_i are vectors of parameters to be estimated, U_i is the white noise error term.

Equation (1) was estimated in a multiplicative form using the PPML estimator in the following specification:

$$T_{ij} = \exp\left(\alpha + \beta_1 GDP_{ij} + \beta_2 GDP_{ji} + \beta_3 DST_{ij} + \beta_4 LL_{ij} + \beta_5 CB_{ij} + \beta_6 COL_{ij} + \beta_7 CC_{ij} + \beta_8 TM_{ij} + \beta_9 CST_{ij} + \beta_{10} TM_{ji} + \beta_{11} CST_{ji}\right) + \mu_i \quad (2)$$

Equation (2) was estimated for both intra-COMESA exports and imports flows. The variables in equation (2) are defined in Table 3.

Table 3: Variable definition

Variable Symbol	Name	Description	Measurement	Expected Sign
T_{ij}	Intra-COMESA trade	Intra-Trade flows (Imports or Exports)	US$	
GDP_i	Gross domestic product of the exporting country	Economic mass of exporting country	US$	Positive
GDP_{ij}	Gross domestic product of the importing country	Market potential of the importing country	US$	Positive
DST_{iJ}	Distance	Geographical distance between trading partner	Kilometers	Negative
LL_{ij}	Land Locked	A Country that is landlocked	1 if landlocked, 0 otherwise	Negative
CB_{ij}	Common Boarder	Trading partners that share a Border	1, is sharing a border, 0 otherwise	Positive
COL_{ij}	Common Official Language	Common Official Language between trading partners	1, for common language, 0 otherwise	Positive
CC_{ij}	Common Colonizer	Countries colonized by the same colonial masters	1 for common colonizer, 0 otherwise	Positive
TM_{ij}	Time	Time spent complying with border formalities on the export side of the border	Hours	Negative
CST_{ij}	Cost	Cost of complying with border formalities on export side of the border	US$	Negative
TM_{ji}	Time	Time spent complying with border formalities on the import side of the border	Hours	Negative
CST_{ji}	Cost	Cost of complying with border formalities on import side of the border	US$	Negative

We have taken care of unobserved heterogeneity using fixed effects. The choice of PPML estimator was informed by our data which comprises zero trade observations thus rendering the log linearized approach inapplicable to our data set. The estimator

used also takes care of heteroscedasticity, a phenomenon inherent in trade data.

3.2 Simulations

The second step of our analysis used simulations method guided by the work of Otsuki (2011), we used the cost and time elasticities of trade estimated in (1), and examined scenarios of reduced cost and time to cross the border post and estimate the quantity of intra-COMESA trade that can be realized. Using cases of two border posts, Chirundu OSBP in North South Corridor (Southern Africa) and Malaba OSBP in the Northern Corridor (East Africa), we also examined scenarios of reduced cost and time to estimate the potential intraregional trade induced by reforms undertaken at these borders. We chose Chirundu One Stop Border Post since it was the first OSBP in Africa and currently one of the busiest borders in Southern Africa. Malaba OSBP, by being in East Africa and along the busiest Northern Corridor, was chosen to provide a comparison between southern and Eastern COMESA Member States.

3.3 Data Sources

Cross sectional data for the year 2015 for 16 COMESA countries[15] was examined in this study. Countries included in the study were chosen based on data availability. Data on costs and time to comply with border formalities were obtained from World Bank trading across borders database. Data on costs and time relating to Chirundu and Malaba OSBPs were accessed from various journals, surveys and evaluation reports (Hoffman et al. 2016; Teravaninthorn and Raballand, 2009; Vincent and Murenzi, 2014; McPherson, 2015, Curtis, 2009 and Chibbabbuka, 2008). Variables that capture distance, common border, land lockedness, common coloniser, and common language were accessed from Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) whilst trade flows data was downloaded from World Integrated Trade Solution (WITS). We have used the imports reported by the reporting country as exports of a partner country because countries tend to keep a good record of imports relative to exports for duty purposes. GDP data for all countries was downloaded from World Development Indicators (WDI).

4.0 Results and Discussion

4.1 Descriptive Statistics

Descriptive statistics are given in Table 4. Intra-COMESA trade reached an average of US$27.5 million in exports and US$18 million in imports for the year 2015. The variation in bilateral trade flows is too large as some countries recorded zero flows whilst maximum export flows reached US$946.6 million and US$52.3 million imports in 2015. Zero flows could be because of rounding off, non-reported data or omission.

On average it takes 83.7 hours (3.48 days) to comply with border formalities on exporting side of the border whilst 127.12 hours (5.29 days) are required to process the exported goods as imports on the other side of the border. At least 8 days are required to cross a border in COMESA countries. Border crossing time ranges 114 hours and 415 hours on the exporting and importing sides of the border respectively. The greater range in border crossing time suggests high unpredictability of supply chains in COMESA countries.

The average costs of complying with border crossing formalities are higher on the import side of the border, averaging US$ 663.83 per shipment whilst those on the export side

15 Burundi, Ethiopia, Kenya, Mauritius, Malawi, Madagascar, Comoros, DRC, Sudan, Rwanda, Uganda, Seychelles, Swaziland, Zambia and Zimbabwe.

averaged US$ 357.5 per shipment in 2015. Again, there is greater variability of formal costs incurred at the border. Whilst the costs on the exporting side are US$844, the importing side they are US$2905. This suggests higher chances of traders meeting huge unexpected costs at the border. With insufficient cash to meet the unexpected costs, delays at border post will be unavoidable as clearance and release are not separated in most cases.

Table 4: Descriptive Statistics

Variable	Mean (Std. Dev.)	Min	Max
Intra- COMESA exports (US$ thousands)	27483.88 (106720.2)	0	946564.1
Intra-COMESA imports (US$ thousands)	18008.18 (61715.78)	0	522617.8
Time (hrs.) spent complying with border formalities on the export side	83.7 (30.40681)	48	162
Time (hrs.) spent complying with border formalities on the import side	127.12 (97.55624)	5	420
Exports complying costs in the exporting side of the border, (US$)	357.5 (253.07)	106	950
Exports complying costs in the importing side of the border, (US$)	663.83 (688.89)	134	3039
Imports complying costs in the exporting side of the border, (US$)	357.5 (253.07)	106	950
Imports complying costs in the importing side of the border, (US$)	663.83 (688.89)	134	3039

4.2 Gravity Model Regression Results

The regression results for the gravity model (1) are presented in Table 5. The coefficients for time variables, (column 1), for both the exporting and importing country for exports flow have expected signs and are highly significant. A 1% increase in time spend at the border on the exporting country side would decrease bilateral export trade by 0.023% in COMESA whilst a 1% increase in time spend at the border on the importing country side, would decrease bilateral export trade by 0.049% in COMESA. Intra-COMESA import flow exhibit similar behavior. A 1% increase in border crossing time in the importing country side of the border will reduce bilateral imports flow by 0.024%.

Coefficients of the cost variables in the intra-exports equation for both the exporting and importing country are positive and significant. The signs of the cost coefficients contradict with theoretical expectations. This implies that traders in COMESA have a

mechanism to handle costs of complying with border formalities.

The coefficients for distance have expected signs and are significant. The results show that a 1% increase in distance would lead to a 1.05% and 2% decrease in intra-export and intra-import trade respectively. Coefficients of land locked are significant though contradicting with the theory. Results suggest that land lockedness increases intra-export trade and intra-import trade respectively. Since land locked countries are expected to incur more trading costs, traders in COMESA have a mechanism to handle costs hence land lockedness is not a deterrent to trade. This implies that trading costs resulting from land lockedness could be easily diversified away by COMESA traders by putting the burden on final consumers.

The coefficient of common border is significant in explaining intra-export COMESA trade and has the expected sign. Countries that share common borders would increase intra-export trade by 373%. Other variables such as common official language, common colonizer and time spent in intra-import trade in dealing with border formalities on the export side of the border are insignificant in explaining intra-COMESA trade.

Table 5: Gravity Model results for Intra-COMESA trade

	(1)	**(2)**
VARIABLES	Intra-exports	Intra-imports
GDP_{ij}	-0**	0
	(0)	(0)
GDP_{ij}	0***	0***
	(0)	(0)
Log DST_{iJ}	-1.052***	-1.948***
	(0.406)	(0.395)
LL_{ij}	6.748***	2.478*
	(2.394)	(1.359)
CB_{ij}	1.554**	0.818
	(0.663)	(0.636)
COL_{ij}	0.749	0.482
	(0.635)	(0.550)
CC_{ij}	-1.008	-0.665
	(0.753)	(0.562)
TM_{ij}	-0.0225**	-0.0153
	(0.0102)	(0.0176)
CST_{ij}	0.00468***	0.00871***
	(0.00129)	(0.00251)
TM_{ji}	-0.0488***	-0.0242***
	(0.0173)	(0.00767)

CST_{ji}	0.0148***	0.00462***
	(0.00361)	(0.00110)
a	5.695	17.09***
	(4.365)	(3.792)
Observations	113	107
R-squared	0.842	0.833

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.3 Simulation Analysis Results

The simulations were carried out using the coefficients estimated from the gravity model using the following formula (percentage reduction in delay * the time coefficient * the average intra-export or import flows in Table 4). The simulations used the time coefficients only because the cost coefficients are carrying a sign that contradicts trade theory and they don't seem to be an issue in reducing bilateral trade flows in COMESA.

4.4 Simulations at Regional Levels

Trade facilitation instruments implemented in East Africa COMESA countries demonstrated that it is possible to reduce time spent at border post from 52.8hours to 9hours. This was achieved in approximately 5 years. We first simulated trade flows with time reduction of 24 hours from the averages given in Table 4 which translate to a reduction of 29% for exporters and 19% for importers. Results of this simulation analysis are given in Table 6. A reduction in delays at the border of 24hours by the exporting country will induce bilateral annual export flows of US$183 320. Whilst a similar reduction in delays at the border by the importing country induces a US$255 870 annual bilateral exports flows. A reduction of border delays by 24hours by both importing and exporting countries will induce annual bilateral trade flows of US$439 190.

Table 6: Export flows simulation with a time decline by 24 hours for both exporting and importing countries

INDICATOR	EXPORTING COUNTRY CHANGE		IMPORTING COUNTRY CHANGE		TOTAL	
	VALUE (US$ 1000)	% CHANGE	VALUE (US$ 1000)	% CHANGE	VALUE (US$ 1000)	% CHAMGE
Time	183.32	0.0067	255.87	0.009	439.19	0.016

Table 7 shows that a reduction in time spent at the border by 24hours (19%) in the importing country would increase bilateral import flows by US$82 800.

Table 7: Import flows simulation with a time decline by 24 hours for both exporting and importing countries

INDICATOR	EXPORTING COUNTRY CHANGE		IMPORTING COUNTRY CHANGE		TOTAL	
	VALUE (US$ 1000)	% CHANGE	VALUE (US$ 1000)	% CHANGE	VALUE (US$ 1000)	% CHANGE
Time	-	-	82.80	0.0046	82.80	0.005

Second, we simulate trade flows with time reduction of 50% which translate to a reduction of 41.85hours (1.74 days) for exporting and 63.6 hours (2.65 days) for importing countries. With commitment these are achievable as evidenced by East Africa COMESA countries' cases and after all, these reductions leave the general COMESA countries worse off relative to the case of East Africa countries. The intention here is just to provide an incentive in this direction of reforms. Results of the simulation analysis are given in

Table 8. A 50% reduction in delays at the border by the exporting country will induce a US$329, 810 increase in annual bilateral export flows. A similar reduction in delays at the border by the importing country will induce a US$687,100 increase in annual bilateral export flows in COMESA. Annual bilateral export flows of US$1 million could be induced if both the importing and exporting countries reduce delays at the border by 50%.

Table 8: Export flows simulation with a time decline by 50% for both exporting and importing countries

INDICATOR	EXPORTING COUNTRY CHANGE		IMPORTING COUNTRY CHANGE		TOTAL	
	VALUE (US$ 1000)	% CHANGE	VALUE (US$ 1000)	% CHANGE	VALUE (US$ 1000)	% CHAMGE
Time	329.81	0.012	687.1	0.025	1016.91	0.037

Bilateral import flows of US$450 200.00 per year could be induced if the importing country reduces border delays by 50% as shown in Table 9.

Table 9: Import flows simulation with a time decline by 50% for both exporting and importing countries

INDICATOR	EXPORTING COUNTRY CHANGE		IMPORTING COUNTRY CHANGE		TOTAL	
	VALUE (US$ 1000)	% CHANGE	VALUE (US$ 1000)	% CHANGE	VALUE (US$ 1000)	% CHAMGE
Time	-	-	450.20	0.025	450.20	0.025

4.5 Simulations at Border Levels

This subsection presents results of simulations at border levels.

4.5.1 Chirundu One Stop Border (OSBP)

The OSBP was established in 2009. On average it took a minimum of 39 hours and a maximum of 49 hour to cross the border in 2008 prior to the establishment of an OSBP, (Chibbabbuka, 2008; Curtis, 2009). In 2012, the border crossing time had reduced to an average of 26 hours, (JICA, 2013). This represents a minimum time reduction of 33% and a maximum reduction of 46%. Using the 2015 level of bilateral trade flows between Zimbabwe and Zambia, we estimated that the time reduction stimulates Zimbabwe's annual exports to Zambia ranging from US$ 2.2 million to US$3.1 million. We assumed that the bilateral exports flows between these countries have a high probability of passing through Chirundu OSBP. Our assumption was made due to lack of actual data on values of trade flows passing through this border.

4.5.2 Malaba One Stop Border Post (OSBP)

The border is between Kenya and Uganda. In 2010 it took an average of 48hours to cross the border (Vincent & Murenzi, 2014). This was reduced to about 6 hours in 2015. This represents a time reduction of about 87.5 %. Using the 2015 level of bilateral trade between Uganda and Kenya, we estimated that the time reduction stimulates Kenyan annual exports to Uganda of US$35 million. Again, we could not find data on actual trade passing through this border, thus, to carry on with the analysis, we assumed that most Kenyan exports to Uganda have a high probability of passing through this border.

4.6 Discussion of Results

The descriptive statistics show that it takes long to comply with border crossing formalities in COMESA. This, coupled with higher range and standard deviation of border crossing times, imply that supply chains in COMESA are very unpredictable and therefore unreliable. Therefore, it is difficult to engage in regional value chains or just in time production scheduling.

The gravity model analysis provides evidence that border delays reduce intra-COMESA trade. It is also shown that exports are more sensitive to border delays by the importing country relative to exporting country. An increase by 1% in border delays by an exporting COMESA country will reduce annual bilateral COMESA exports by approximately US$700 000 whilst the same increase in border delays by the importing country reduces export trade by approximately US$ 1.3 million. An increase in border delays by 1% by both importing and exporting countries will cost COMESA an annual bilateral trade flow of approximately US$2 million. Our findings are comparable to those of Hoffman et al. (2016); Martincus & Graziano (2012) and Freund & Rocha (2010).

The results demonstrate that greater loss of exports is induced by delays on the importing side of the border compared to the exporting side. It could be that COMESA countries rely mostly on import revenues, hence there are more time-consuming formalities on the importing side of the border to guard against loss of revenue. Thus, trade facilitation interventions in the exporting country alone will have marginal impact on its exports. Therefore, to promote exports, the exporting country needs to jointly implement trade facilitation reforms with the importing country.

Based on simulation results, we infer that unilateral reduction of border delays by the exporting country generate less trade flows relative to border reforms by the importing country alone. Joint reduction of border delays by the exporting and importing countries generate more intra-COMESA trade relative to the unilateral cases. Trade facilitation reforms by one trading partner generate efficiency which can be wasted by the adjoining state that has not implemented a complimentary reform. Greater efficiency in trade

facilitation is therefore generated when reforms are undertaken at bilateral, corridor or regional level.

These results imply that trade facilitation initiatives implemented in various COMESA countries to reduce delays at border posts such as national single window systems, Risk Management systems, Authorized Economic Operators (AEO), electronic cargo tracking systems and data exchange have negligible positive impact on intra-COMESA trade when implemented nationally. Countries will trade more and better when both exporting and importing countries implement these reforms jointly. If national single window system is integrated with that of the adjoining state, then export declaration by the exporting country automatically becomes import declaration to the importing country thereby reducing the repetitive submission of the same information. Similarly, mutual recognition of AEOs by trading countries ensures that trusted traders are facilitated on both side of the border.

The analysis of Chirundu and Malaba OSBPs reveal that these practical projects can reduce time to cross the border and therefore induce more trade. Malaba Border post reforms reduced crossing time by a larger magnitude and therefore induced more trade relative to Chirundu OSBP. However, we take note that Kenya and Uganda naturally trade more compared to Zambia and the low performing Zimbabwean economy. The magnitude of time reduction resulting from reform is very critical as it matters in determining the quantum of trade to be induced. Thus countries need to set time bound targets of time reduction whenever implementing trade facilitation reforms. That practice is also critical for evaluation and benchmarking of performance.

The study revealed that the costs of complying with regulatory formalities at border posts do not reduce intra-COMESA exports. The implication is that traders pass on these costs to consumers which results in the general increase in consumer prices in the region thus reducing consumer welfare. A reduction in statutory fees paid at border posts may assist in reducing poverty levels in the region.

The costs considered in this study do not include insurance and informal payment for which a receipt is not issued. Contrary, delays are key determinants to supply chain predictability which affects traders' decisions on production and satisfying varying customer demands. It is difficult for traders to diversify away delays at the border.

5.0 Conclusions and Policy Recommendations

5.1 Conclusions

An attempt was made to estimate the impact of border crossing costs and delays on intra-COMESA trade. A gravity model of trade and simulation methodologies were applied in data analysis. Increase in border delays by both importing and exporting countries reduce bilateral annual export flows between COMESA Member States. Unilateral/ national reforms aimed at reducing border delays induce less trade flows relative to bilateral initiatives.

5.2 Policy Recommendations

The study recommends the implementation of trade facilitation reforms that reduce border crossing time to stimulate intra-COMESA trade. Examples of such reforms include establishing One Stop Border Posts at ports of entry or exit of COMESA member states, interfacing of customs electronic data interchange systems of adjoining Member

States, implementation of regional integrated risk management systems, regional single window systems, and mutual recognition of Authorized Economic Operators (AEOs) and SPS Standards in the region. There is need for deeper integration of border management systems. Significant time reduction which has high impact on intra-COMESA trade is likely to be realized when these reforms are implemented at bilateral, corridor or regional levels.

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AN AUDIT OF NON-TARIFF BARRIERS IN COMESA, THEIR CAUSES AND COSTS

By

Jane Wangechi Kibiru and Benedict Musili Musengele

Abstract

This study used desk review and fieldwork approach to investigate Non-tariff barriers existing in COMESA, their causes and costs. The results revealed that; since the inception of the online NTB reporting mechanism in 2008, 204 NTBs have been reported and 182 have been resolved resulting into a success rate of 89.2 percent; the most prevalent NTBs are customs and administrative entry procedures, transport, clearing and forwarding, and specific limitations. There are 11 outstanding NTBs among COMESA Member States. The resolution of NTBs does not adhere to timeframes set in COMESA Regulations on Elimination of NTBs.

The study further found the following causes of outstanding NTBs; protection of domestic industries, existence of different SPS standards, poor macroeconomic conditions, smuggling of products across borders, need to cater for border allowances for employees, low third party liability cover in case of death, delays and bureaucracy in the claim process of COMESA Yellow Card, misinterpretation of the Protocol on Rules of Origin, need to encourage local sourcing of inputs, government revenue generation , and prevention of illegal harvesting and trade in endangered tree species.

The major costs of the NTBs are reduction in imports and profits, loss of market, investments and revenue, increase in the cost of doing business and uncertainty in future contracting.

The major recommendations from the study are: COMESA should adopt a preventive approach in dealing with NTBs, the Council should recommend to the Authority to impose sanctions as may be appropriate against a Member State that do not provide notifications before introduction of NTMs; COMESA should harmonize SPS measures through implementation of the COMESA Green Pass (CGP) to facilitate trade in agricultural products; Member States should adhere to the NTB resolution time frames set out in the COMESA Regulations on Elimination of NTBs to ensure timely resolution of NTBs and enhance intra-regional trade; there should be periodic audit/review of the COMESA- EAC-SADC online mechanism for reporting, monitoring and eliminating NTBs to ensure correct and up to date record for easy follow up of NTBs.

1.0 Introduction

Regional trade blocs can yield dynamic or growth effects through providing domestic firms with access to larger market, making it possible to exploit economies of scale and overcome limitations of small size of national economies (UNCTAD, 2013).

With the global reduction of tariffs due to trade liberalization at multilateral and regional levels, non-tariff barriers have become more widespread and are a major determinant in restricting market access. NTBs can undermine the gains from trade liberalization for existing and new entrants, impede diversification efforts across products as well as markets (Keane at al 2010).

There are different definitions of non-tariff barriers, for instance, NTBs refer to the wide and heterogeneous range of policy interventions other than border tariffs that affect and distort trade of goods, services, and factors of production (Beghin, 2006), NTBs are discriminatory non-tariff measures imposed by Governments to favour domestic over foreign suppliers (UNCTAD, 2013). The COMESA-EAC-SADC NTB online mechanism for reporting, monitoring and eliminating NTBs defines NTBs as restrictions that result from prohibitions, conditions, or specific market requirements that make importation or exportation of products difficult and/or costly. NTBs also include unjustified and/or improper application of Non-Tariff Measures (NTMs) such as sanitary and phytosanitary (SPS) measures and other technical barriers to Trade (TBT).

Trade liberalization is a key aspect of COMESA integration as contained in Article 45 of the Treaty. COMESA launched a Free Trade Area (FTA) in November 2000 with the aim of facilitating regional integration through zero custom tariffs on goods traded among the Member States. The FTA provides for rules that prohibit the re-imposition of custom duties and non-tariff barriers, with systems for addressing any trade barriers that may come up. In 2017, fifteen Member States were participating in the COMESA FTA[16]. In the case of non-FTA Member States, Eritrea applies 80 % tariff reduction in its trade with COMESA Member States, D.R. Congo would reduce customs duty in three phases of 40%, 30% and 30% each year from 2016 to 2018; Ethiopia reduced its tariffs by 10% in 1989 for COMESA originating products and Swaziland is under derogation. COMESA launched a Customs Union in June 2009 and it is in the process of being operationalized.

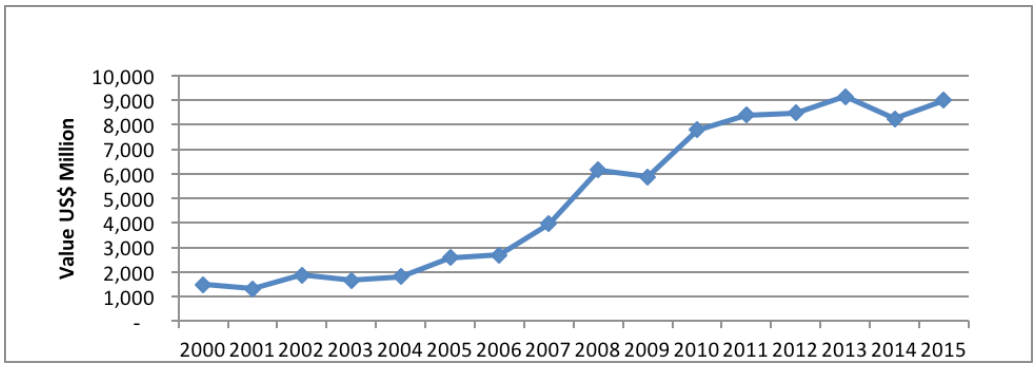
1.1 Intra-COMESA Trade

COMESA trade liberalization efforts, like the rest of the world have been met with increased prevalence of non- tariff barriers affecting intra-COMESA trade. Intra-COMESA exports as a proportion of total exports remains low accounting for 12.2 percent in 2015 compared with 61.6 percent in European Union and 24.5 percent in Association of Southeast Asian Nations (ASEAN) (UNCTAD, 2017). NTBs contribute to high costs of doing business, inhibit intra-regional trade and are more widespread and restrictive in the agricultural sector than the manufacturing sector. In COMESA, removal of NTBs remain therefore very critical for increasing trade in agricultural commodities (Sukati, 2016).

Intra-COMESA exports increased from US$1.5 billion in 2000 after the establishment of Free Trade Area to US$ 9.0 billion in 2015, representing 500 percent growth however, there were periods of downturn in 2001, 2003, 2009 and 2014 as shown in figure 1.

16 Burundi, Comoros, Djibouti, Egypt, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Uganda, Zambia and Zimbabwe

Figure 1: Intra-COMESA Exports 2000-2015

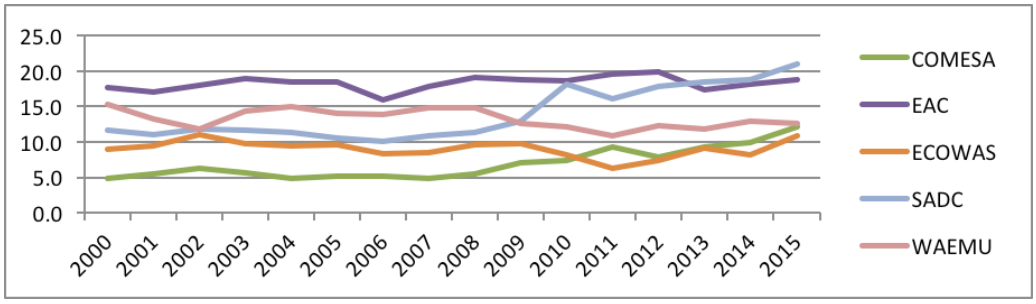


Source: Calculations based on COMSTAT database, 2017

Intra-COMESA trade excludes informal cross border trade estimated at over 40 per cent of regional total trade (Wanjiku et al.,2011). Some of the determinants of informal trade include stringent documentary requirements including rules of origin, sanitary and phytosanitary measures, road blocks and corruption at border points.

COMESA lags behind its peers with an average intra-regional trade of 6.9 per cent over the period 2000-2015 compared to EAC (18.3 per cent), SADC (14 per cent), WAEMU (13.3 percent) and ECOWAS (9 per cent) as shown in figure 2.

Figure 2: Intra-Regional Trade as a share of total Trade 2000-2015



Source: Calculations based on UNCTADstat Database, 2017

Intra-COMESA trade remains low relative to its potential estimated at US$ 82.4 billion in 2014. The products with greater potential include; textiles, wooden furniture, horticultural products, household items, hides and skins, footwear and leather products, sugar confectionery, unmanufactured and manufactured tobacco and precious metals. The following hinder exploitation of intra-COMESA trade potential; non-implementation of the agreed COMESA trade rules, substandard products from China and Eastern Asia, unnecessary roadblocks, lack of information on the production capacity of other Member States, limited connectivity of the railway infrastructure network and inefficiency of its services within the region, high cost of freight from the Island Member States to the inland markets due to trans-shipment (Musengele et al., 2016).

1.2 Objectives of the Study

The Thirty Sixth meeting of the Council of Ministers held on 14-15 October 2016 in Antananarivo, Madagascar directed the Secretariat to undertake a comprehensive audit of NTBs in the COMESA region, covering all categories of NTBs, their causes and costs, and in collaboration with relevant partners, produce recommendations for consideration by the Trade and Customs Committee.

Specifically, the study sought to;

i. Establish the number and categories of NTBs in the COMESA region, and

ii. Identify the causes and costs of existing NTBs

1.3 Methodology

The study was based on desk review of existing literature on non-tariff barriers including but not limited to the COMESA Treaty, COMESA Regulations on Elimination of Non-Tariff Barriers, COMESA-EAC-SADC NTB online mechanism for reporting, monitoring and eliminating NTBs, various reports and studies on NTBs.

Additionally, fieldwork was undertaken in 8 Member States (Burundi, Egypt, Kenya, Malawi, Mauritius, Uganda, Zambia and Zimbabwe) with outstanding NTBs to identify the causes and costs of the NTBs. The 8 Member States were selected through purposive sampling, an interview guide was developed and administered through face to face interviews. The consultations were done through individual interviews and focussed group discussions.

Some of the stakeholders consulted include COMESA coordinating ministries (Ministries of Trade and Industry), firms whose products have been affected by existing NTBs, Chambers of Commerce, Association of Manufacturers, Police and Customs Authorities.

The data collected during the fieldwork was analysed and collated to deduce the key findings.

2.0 Framework for Monitoring and Eliminating Non-Tariff Barriers in COMESA

2.1 Legal and Regulatory Framework

Article 49(1) of the Treaty provides for removal of all existing NTBs to intra-COMESA trade upon entry into force of the Treaty and thereafter to refrain from imposing any other restrictions or prohibitions. Articles 49(2) and (5) however provides for exceptions for imposition of restrictions to trade for purposes of protection of an infant industry or overcoming balance of payments difficulties. Article 50 further provides that restrictions for protection of human, animal or plant life and public morality and maintenance of food security in the event of war and famine. The Member State is however required to give notice to the Secretary General.

COMESA Regulations on NTBs, adopted by the Council in 2014 provides for the institutional structures for the elimination of the NTBs, general categorization of NTBs in COMESA, reporting and monitoring tools, facilitation of the resolution of identified NTBs as well as enforcement of outcome of the resolution.

2.2 Institutional Structure

COMESA council of ministers in 2004 made a decision that Member States should designate COMESA Enquiry Points/NTBs National Focal Points and set up National Monitoring Committees (NMCs). NMCs comprise relevant stakeholders representing the private and public sectors. According to the COMESA Regulations on NTBs, the role of NMCs include; identifying and monitoring NTBs, defining the process of elimination, confirming deadlines for action, agreeing on recourse due to non-action, and defining the mandate and responsibilities of NTB institutional structures.

The role of National Focal Points on NTBs include coordinating the implementation of the COMESA mechanism for the elimination of NTBs; providing secretariat services to the National Monitoring Committee (NMC); facilitating the removal of NTBs and report on their elimination; tracking and monitoring NTBs through utilization of the reporting tools; providing clear guidelines to the business community on the areas identified as NTBs; and sensitizing stakeholders on the monitoring and evaluation mechanism and NTBs reporting tools.

2.3 Mechanism for Elimination of Non-Tariff Barriers in COMESA

The Regional Economic Communities of COMESA, EAC and SADC, under the Tripartite Agreement are implementing an online mechanism for reporting, monitoring and eliminating NTBs (available at www.tradebarriers.org). The web-based mechanism provides a systematic and transparent process for identification, reporting, monitoring and elimination of barriers to trade in the tripartite region. It is accessible to economic operators, government functionaries, academic researchers and other interested parties. The success rate of the mechanism is 89.2 percent with182 of the reported/imposed 204 NTBs resolved.

The tripartite has also developed a mobile short messaging service (SMS) reporting tool to complement the online mechanism. It involves utilisation of local lines to report NTBs to a server hosted by the coordinating ministry, which will make it easier for those who may not have access to internet to report NTBs. The tool will be housed in the Member States and managed by NMC members through the Tripartite NTB/NTM online reporting mechanism.

Member States in 2016, developed a Time bound NTB elimination matrix in accordance with Article 10 (1) of the NTB Regulations on Elimination of NTBs. In addition, NTBs have become a standing agenda item in Trade and Customs meetings.

2.4 Non-Tariff Barriers Resolution Process

Article 11 of the COMESA Regulations on Elimination of NTBs, provides for elimination and co-operation in the elimination of NTBs which involves two stages.

1. Request and Response on a Specific NTB

A Member State individually or jointly with other Member States, through the Secretariat, requests in writing for information from the imposing Member State detailing the description of the NTB and its concerns regarding the NTB's impact on trade. The responding Member has 20 and not more than 30 days to provide a written response. If the response is acceptable the issue is resolved. If the parties agree that the complaint is a NTB, NMC develops an elimination plan.

Where the response does not resolve the complaint, the requesting Member State notifies the responding Member State and the Secretariat who convenes a meeting with the parties within 20 days from the date of receiving the notification to resolve the complaint. If the complaint is not resolved, both parties may agree to move to stage two by notifying their decision to the Secretariat which is circulated to all Member States. If the parties do not agree, any of the parties can take the matter to the COMESA Court of Justice. The proceedings should not exceed 60 days unless mutually agreed by the parties. In case of perishable goods, the period is reduced by half and the parties may agree on interim solutions pending final resolution.

2. Facilitation Stage

Stage two involves appointment of a facilitator acceptable to both parties in accordance with agreed criteria and procedures. The facilitator is drawn from a list of experts maintained by the Secretariat and notified to the Member States. Each Member State can suggest a total of five experts to be included in the list, which is reviewed annually. No Member State is allowed to amend its list of facilitators and experts upon initiation of stage two proceedings. The parties jointly agree on the terms of reference for facilitator. They also agree upon the facilitator within 10 days of commencement of stage two.

The facilitator assists the parties, in an impartial and transparent manner with a view of bringing clarity on the NTB concerned and its possible trade related impact. The facilitator:

a) With the support of the Trade and Customs Committee, calls upon the Secretariat or any relevant resource to provide information;

b) Meets individually or jointly with the parties in order to facilitate discussions on the NTB and to assist in reaching mutually agreed solutions;

c) Seeks assistance where necessary, of relevant experts and stakeholders after consulting with the parties

d) Provides any additional support requested by the parties; and

e) Offers advice and propose possible solutions (technical opinion) for the parties provided any such opinion shall not pertain to any possible legitimate objectives for the maintenance of the measure

The parties should reach a mutually agreed solution within 40 days from the commencement of the proceedings.

Upon termination by either party, or in the event that the parties reach a mutually agreed solution, the facilitator issues a draft factual report, providing a brief on; the NTB at issue in these procedures, the procedures followed, any mutually agreed solution as the final outcome of these procedures, including possible interim solutions, and any areas of disagreement. The parties have 10 days within which to comment on the draft report. After considering the comments of the parties, the facilitator submits, in writing, a final factual report to both parties and the Secretariat within 10 days of receiving the comments.

Where the parties reach a mutually agreed solution, the solution is circulated to all Member States through the Secretariat and implemented in accordance with an elimination plan as provided for under article 10 of NTB Regulations. Where a Member State fails to implement an agreed solution to an NTB, Article 171 of the Treaty is invoked. In the event that the parties do not reach a mutually agreed solution, the matter is addressed by the COMESA Court of Justice.

3.0 Non-Tariff Barriers in COMESA

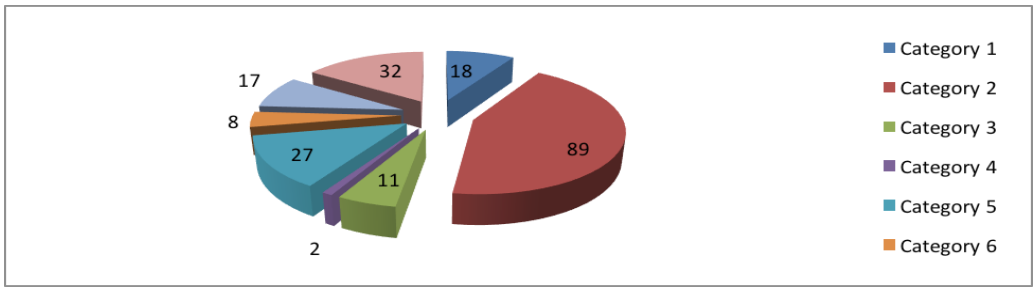
The online reporting and monitoring mechanism classifies NTBs into eight categories namely: Government participation in trade and restrictive practices tolerated by governments; Customs administrative entry procedures; Technical Barriers to Trade(TBT); Sanitary and Phytosanitary (SPS) measures; Specific limitations; Charges on imports; Other procedural problems; and Transport, Clearing and Forwarding.

3.1 Non-Tariff Barriers Reported and Imposed by Member States

Since the inception of the online reporting mechanism in 2008, 204 NTBs have been reported among the Member States. 182 have been resolved resulting in a success rate of 89.2 percent while 22 are outstanding. Of the 22 outstanding NTBs, 11 are among COMESA Member States, 9 are among EAC Partner States that are COMESA Member States and 2 are among SADC Member States out of which 8 are COMESA Member States.

The number of reported NTBs under the various categories are shown in Figure 4. The most prevalent NTBs relate to category 2 on customs and administrative entry procedures with a total of 89, category 8, Transport, clearing and forwarding with 32 and category 5 on specific limitations with a total of 27 NTBs. The top three NTBs categories account for 72.5 percent of the total reported NTBs.

Figure 4: Number of Reported NTBs per Category 2008-April 2017



Source: Author's calculations based on COMESA-EAC-SADC Online Mechanism for Reporting NTBs

There are instances of mis-classification of NTBs. For example, NTB No. 000-312, on lack of banking facilities in Democratic Republic of Congo, is non-actionable but is classified under category 3 on Technical Barriers to Trade (TBT), NTB No.033 on ban of beef imports imposed by Uganda on Kenya imports (due to Bovine Spongiform Encephalopathy (BSE) disease) is classified under category 5.10 on prohibitions while it is a SPS measure under category 4. In addition, some of the NTBs have been recorded twice, for example, NTB No. 000-731 on introduction of fees on motor vehicles exiting and entering Zambia.

The NTBs reported and imposed by Member States/REC are shown in Table 1.

Table 1: NTBs Reported and Imposed from 2008 to April 2017 (Number and percentage shares)

Country/REC/ Organization	No of Reported NTBs	% Reported	No. of Imposed NTBs	% Imposed
Burundi	6	2.9	2	1.0
Comoros	0	0	0	0
Djibouti	0	0	0	0.0
DRC	4	2.0	5	2.5
Egypt	8	3.9	4	2.0
Eritrea	0	0	1	0.5
Ethiopia	0	0	2	1.0
Kenya	28	13.7	28	13.7
Libya	0	0	0	0
Madagascar	3	1.5	6	2.9
Malawi	19	9.3	27	13.2
Mauritius	5	2.5	1	0.5
Rwanda	15	7.4	8	3.9
Seychelles	11	5.4	12	5.9
Sudan	0	0	4	2.0
Swaziland	13	6.4	9	4.4
Uganda	17	8.3	14	6.9
Zambia	18	8.8	34	16.7
Zimbabwe	52	25.5	40	19.6
EAC	0	0	6	2.9
SADC	2	1.0	1	0.5
FESARTA	3	1.5	0	0
Total	204	100	204	100

Source: Calculations based on COMESA-EAC-SADC Online Mechanism for Reporting NTBs

Zimbabwe reported the highest number of NTBs (52) accounting for 25.5%. Following Zimbabwe was Kenya (28), Malawi (19), Zambia (18) and Uganda (17) accounting for 13.7%, 9.3%, 8.8% and 8.3% in that order. Comoros, Djibouti, Eritrea, Ethiopia, Libya and Sudan did not report any incidence of NTB.

On imposition of NTBs, Zimbabwe imposed the highest number of NTBs (40) accounting for 19.6% of the total NTBs. Zimbabwe is followed by Zambia (34), Kenya (28), Malawi (27), and Uganda (14) accounting for 16.7%, 13.7%, 13.2% and 6.9% respectively. The top five countries in imposition of NTBs accounts for 70.1 percent of total imposed NTBs. Comoros, Djibouti and Libya did not impose any NTB over the period.

Comoros, Djibouti, Eritrea, Ethiopia, Libya and Sudan did not report any incidence of NTB while Comoros, Djibouti and Libya did not impose any NTB.

3.2 Resolved Non-Tariff Barriers

The resolved NTBs in their number, percentage and categories are shown in Table 2.

Table 2: Resolved NTBs 2008 to April 2017

NTB Category	No. Reported	No. Resolved	% Resolved	No. Outstanding
Category 1	18	16	88.9	2
Category 2	89	83	93.3	6
Category 3	11	10	90.9	1
Category 4	2	0	0	2
Category 5	27	22	81.5	5
Category 6	8	7	87.5	1
Category 7	17	17	100	0
category 8	32	27	84.4	5
Total	204	182	89.2	22

Source: Calculations based on COMESA-EAC-SADC Online Mechanism for Reporting NTBs

Since 2008, 204 NTBs have been reported/imposed and 182 have been resolved representing a success rate of 89.2%. The resolution of the various categories is as follows; Other procedural problems (100%), customs administrative entry procedures (93.3%), Technical barriers to trade (90.9%), Government participation in trade and restrictive practices tolerated by governments (88.9%), Charges on imports (87.5%), Transport, clearing and forwarding (84.4%) and Specific limitations 5(81.5%). None of the NTBs on Sanitary and Phytosanitary (SPS) measures has been resolved.

3.3 Outstanding Non-Tariff Barriers

As at April 2017, there were twenty two (22) outstanding NTBs; 11 among COMESA, 9 among EAC and 2 among SADC Member States as shown in Tables 3, 4 and 5.

Table 3: NTBs among COMESA Member States

	Description	Reporting Country	Imposing Country	Status as at 23 June 2017
1.	Issues related to Rules of Origin on pure palm based cooking oil	Kenya	Zambia	Bilateral scheduled for August 2017
2.	Technical barriers to trade on milk	Kenya	Zambia	Bilateral scheduled for August 2017
3.	Import licensing requirements for a variety of products	Zambia	Zimbabwe	Zimbabwe to provide SI 64

4.	Issues related to Rules of Origin on ceramic tiles	Egypt	Sudan	Being handled at bilateral level
5.	Import licensing on cement, refined cooking oil, laundry soaps and other products	Zambia	Malawi	Resolved
6.	Denial of entry of Zambian trucks into Malawi due to lack of import licenses	Zambia	Malawi	Resolved
7.	Additional taxes and other charges on the Malawi side of Muchinji border post	Zambia	Malawi	Resolved
8.	Government policy and regulations in regard to lack of honouring of COMESA yellow card	Burundi	Uganda	Resolved
9.	Issues related to Rules of origin on sugar under "V" criteria	Mauritius	Kenya	Resolved
10.	Surtax charge of 5% on imported goods that are manufactured or produced in Zambia	Kenya	Zambia	Zambian Authorities reviewing the measure
11	Prohibition of importation and transit of selected logs through Zambia	Democratic Republic of Congo	Zambia	Resolved

Source: Table based on COMESA- EAC- SADC online Mechanism for Reporting NTBs

Table 4: NTBs among EAC Partner States

	Description	Reporting Country	Imposing Country	Status as at 23 June 2017
1.	Costly road user charges/fee for port parking charges of Kshs. 500 per day for trucks	Burundi	Kenya	Consultations ongoing
2.	Costly road user charges of Kshs. 6,000 for transit cargo trucks	Burundi	Kenya	Consultations ongoing
3.	Preference given to domestic bidders/suppliers for supply of electric cable products	Uganda	Kenya	Consultations ongoing
4.	Vehicle standards in relation to lorries imported from Germany without mud guards attracting a fine of Kshs. 30,000	Uganda	Kenya	Resolved

5.	Costly road user charges/fee in relation to double payment for certificate of transit goods (truck and trailer) of USD 400	Burundi	Rwanda	Resolved
6.	Inadequate or no information on change of export and import procedures	Kenya	Uganda &Rwanda	Resolved
7.	Additional taxes and other charges due to additional verification of exports to DRC	Kenya	Uganda	Resolved
8.	Temporary geographic prohibitions for SPS reasons on beef imports	Kenya	Uganda	Resolved
9.	Temporary geographic prohibitions for SPS reasons on beef and beef imports	Kenya	Uganda	Resolved

Source: Table based on COMESA-EAC- SADC online Mechanism for Reporting NTBs

Table 5: NTBs among SADC Member States

	Description	Reporting Country/ Region	Imposing Country	Status as at 23 June 2017
1.	Border taxes relating to introduction of fees on all motor vehicles exiting and entering Zambia	SADC	Zambia	Consultations are ongoing
2.	Carbon tax increase of over 37% for commercial vehicles	SADC	Zambia	Consultations are ongoing

Source: Table based on COMESA-EAC- SADC online Mechanism for Reporting NTBs

4.0 Causes and Costs of Non-Tariff Barriers

The direct and indirect costs of NTBs to the private sector include lost man-days during goods transit and clearance at the internal borders and along the transport corridors, various non-official cost enhancements arising from scope for fraudulent behaviour created through the flexible implementation of national policies, official payments necessary for goods trade, and the lost business opportunities which is difficult to quantify (World Bank, 2008).

NTBs are not only the main obstacles to international trade and investments, they lead to welfare loss, increase the operating costs of firms and hampers firms' access to markets (Hanif et al, 2011).

4.1 Causes of outstanding Non-Tariff Barriers

According to the NTB online reporting, monitoring and elimination mechanism, there were eleven outstanding NTBs among COMESA Member States as at April 2017 and their causes as discussed therein.

a) Technical barriers to trade on UHT milk between Zambia and Kenya.

The NTB arose in 2003 as a procedural issue. The NTB was caused by importation of milk from Kenya by Gourock Ropes and Canvas Ltd without the necessary import licenses thereafter Zambia authorities became aware that the Kenyan legislation allows for a maximum of 2, 000 000 cfu in raw milk which is above the allowed standards in Zambia of 200, 000 cfu. During the fieldwork, it was established that Zambian government has invested in small scale dairy farmers through trainings and provision of cooling facilities in milk collection centres to ensure that the milk meet the required standards hence there is a deliberate effort to protect the Zambian dairy farmers. Kenya applies the EAC graded standards which allow for a minimum of less than 200,000 cfu and maximum of 2,000,000 cfu for raw milk as follows: grade1<200,000 cfu; grade 2>200,000 to 1,000,000 cfu; and grade 3>1,000,000 to 2,000000 cfu. However, Kenya processors receive milk of different grades that can be processed into different products. Some of the processors like Bio food receive raw milk with less than 50,000 cfu/ml.

b) Rules of Origin on pure palm based cooking oil between Zambia and Kenya

The NTB arose in 2003 and relates to whether the Kenyan pure palm based cooking oil meets the 35% COMESA Rules of Origin value addition criterion. The main cause of the NTB was to protect the Zambian palm based cooking oil. During the fieldwork, Zambian authorities reported that the palm-based cooking oil industry was still at infant stage and needed protection to grow. The Private sector indicated that, their concerns at the onset was that the palm based cooking oil from Kenya was being treated as semi-processed while it was a final product. They lobbied for increase of duties from K 2.2 to K4 per litre which was effected.

c) Import licensing requirements for a variety of products between Zambia and Zimbabwe

Zimbabwe through Statutory Instrument 64 of 2016 cited as the Control of Goods (Open General Import License) (No. 2) (Amendment) Notice, No. 8 of 2016, dated 17 June 2016 introduced import licensing requirements for the following products: Coffee creamers; camphor creams; white petroleum jelly; body creams; plastic pipes and fittings; wheel barrows, flat-rolled products of iron or non-alloy steel, metal clad insulated panels; baked beans; potato crisps; cereals; bottled water; mayonnaise; salad cream; peanut butter; jams; Maheu; canned fruits and vegetables;, pizza base; yoghurts; flavoured milks; dairy juice blends; ice creams, cultured milk; cheese; second hand tyres; baler and binder twine; fertilizers; tile adhesive and tylon; shoe polish, synthetic hair products; flash doors, beds; wardrobes; bedroom and dining room suites; office furniture; tissue wading; and woven fabrics of cotton.

SI 64 of 2016 was aimed at reviving the manufacturing industry in Zimbabwe which was facing the following challenges; low production levels due to depressed demand for locally produced goods and high preference for imports; reduction in capacity utilisation from 57.2% in 2011 to 34% in 2015; closure of 168 companies in 2014, liquidation of

over 700 companies in 2013, retrenchment of 2,179 and 3,881 workers in 2013 and 2014 respectively, and dumping of goods from neighbouring countries due to depreciation of currencies in the country to the United States Dollar. This was especially the case with South Africa, with Zimbabwe recording a trade deficit of more than US$ 3 billion in favour of South Africa for the past six years. However, when the statutory instrument came into force, there were delays in clearing of raw materials at the borders which affected manufacturing processes and increased the costs of doing business.

The Zimbabwean authorities needed to take immediate measures to prevent the closure of more companies and did not have the capacity to prepare the required documentation to apply for a safeguard and therefore imposed SI 64.

d) Import licensing on products from Zambia to Malawi

On 13 April 2016, Zambia reported the enactment of the Republic of Malawi Control of Goods (Import and Export) (Commerce) Order, 2015 dated 18 December 2015. The Statutory Instrument places import restrictions for cement, refined cooking oil, laundry soaps, liquor in sachets and fresh milk. The order contains strict conditions and instructions for the acquisition of the import licence.

The purpose of the import licensing was to protect local industries are producing similar products. In particular, local cement was not able to compete with imports which resulted to retrenchment of workers and almost led to closure of some companies. During field work, the Malawian authorities indicated that the NTB had been resolved on 17 May 2017.

e) Denial of entry of Zambian trucks into Malawi due to lack of import licences

The NTB was reported on 6 April 2016 in relation to the Republic of Malawi amended Control of Goods (Import and Export) (Commerce) Order, 2015. The Statutory Instrument places import restrictions for cement, refined cooking oil, laundry soaps, liquor in sachets and fresh milk and other products. Traders are required to obtain import license to import the goods that are subject to this Statutory Instrument into the Republic of Malawi. This has had adverse effects on a company exporting and importing products under heading 25(salt, sulphur, earths and stone, plastering materials, lime and cement) to and from Malawi. Trucks from the company were denied entry into Malawi on 11th December 2015.

The trucks were transporting smuggled cement when they were impounded along Lilongwe road by customs officers. The NTB was resolved on 17 May 2017.

f) Additional taxes and other charges between Zambia and Malawi

The NTB was reported on 9 January 2017.It relates to overtime fee of MWK 1,000 charged by border officers on the Malawi side of Mchinji to attend to clients.

Overtime fee was introduced through a government Act in the 1990s. The Act provides for payment of MWK 500 per truck during weekends and public holidays along the borders. The purpose of the overtime fee was to cater for border allowances for employees working at the borders. The overtime fee has not been reviewed upwards and is currently less than US$ 1 compared to US$ 7.5 in 2001. The overtime fee may not be serving the

objective for which it was introduced. The Malawian authorities indicated that the NTB had been resolved, however according to the NTB online reporting mechanism, the NTB was outstanding as at 18 July 2017.

g) Government policy and regulations between Uganda and Burundi

On 11th July 2016, Burundi reported that Uganda does not honour the COMESA Yellow Card in case of accidents. The COMESA Yellow Card covers third-party liabilities and medical expenses for the driver of the vehicle and his passengers in case of any bodily injury as a result of an accident to an insured vehicle.

The causes of the NTB are, first, the low third party liability cover amounting to UGX 1,000,000 (US$ 250) in case of death of a third party. The third-party liability cover is limited to the statute provisions of road traffic third party award limits of the country in which the accident happens. Second, there are delays and bureaucracy in the claim process due to manual administration of Yellow Card. For instance, in case of an accident involving a vehicle registered in a different Member State, the National Bureau in the country where the accident has taken place, has to liaise with the National Bureau of the country where the vehicle is registered, who has to contact the Primary Insurance Company(PIC) that issued the Yellow Card in order to get the details of the Yellow Card of the particular vehicle. In most cases, relatives of the bereaved persons opt for civil suit.

A particular case was where a truck with registration number 9725AB19/6792AC19 was involved in an accident with a 14-seater taxi registration number UAV 670F on 27th October 2015.Five people died on the spot, 4 were seriously injured and 3 sustained minor injuries. The driver of the truck ran away and the vehicle did not have any documentation hence it was withheld by the police. Three of the deceased were compensated by National Insurance Company (NIC) however relatives of the other two deceased lodged a civil suit. The NTB was resolved during the 22nd meeting of the EAC NTBs Forum held on 7 December 2016.

h) Issues related to Rules of origin on sugar between Kenya and Mauritius

Refined sugar from Mauritius was denied entry into Kenya on 17 March 2017 by Kenya Revenue Authority. This was due to misinterpretation of the Protocol on Rules of Origin. Kenya questioned whether sugar from Mauritius had met the 35% value addition criterion due to a sudden increase in sugar imports from Mauritius under “V” criteria while previous imports were based on “P” criteria.

During the fieldwork, it was established that Mauritius imports raw sugar from Brazil which is kept in the customs duty-free port and used for processing industrial sugar which is mainly for export. The sugar is blended with wholly Mauritian produced sugar. The blending is at 82.4% non-originating sugar and 17.6% locally produced sugar. There is a production loss of 3% between the refined and raw sugar during processing. The fieldwork mission confirmed that the refined sugar in Mauritius met the 35% value addition criterion.

i) Surtax on all imported products that are produced or manufactured in Zambia between Zambia and Kenya.

On 20th February 2017, Lake Kariba Harvest Commercial Ltd, Zambia, that is involved

in distribution of tilapia from Zimbabwe reported that the Government of Zambia had enacted the Customs and Excise Amendment Act number 47 of 2016 effective 1 January 2017.The amendment imposes a surtax of 5% on all imported goods that are produced or manufactured in Zambia. The NTB was also reported by Kenya on 21 February 2017. The surtax has affected exports of margarine by Bidco Kenya.

The imposition of surtax was meant to encourage local sourcing of inputs into the manufacturing sector to reduce the cost of production. The private sector lobbied for imposition of surtax on locally produced inputs however there was a blanket application of the surtax covering inputs not locally produced and finished products as a way of raising revenue for the government.

j) Prohibition of importation and transit of selected logs through Zambia between Zambia and Democratic Republic of Congo.

On 26 April 2017 transporters from DR Congo reported that the Government of Zambia had enacted Statutory Instrument number 31 of 2017. The SI is cited as "The control of Goods (Import and Export) (Forest Produce) (Prohibition of Importation) Order, 2017". The order bans importation including transit of specified logs through Zambia. About 600 trucks carrying mukula logs were impounded in various parts of Zambia.

The SI was introduced to prevent illegal harvesting and trade in endangered tree species. During field work, Zambian authorities reported that the NTB had been resolved however the NTB online reporting mechanism indicates that the NTB is in process of being resolved as at 19 July 2017.

4.2 Costs of Outstanding Non-Tariff Barriers

a) Technical barriers to trade on UHT milk between Zambia and Kenya.

The NTB has led to loss of market for Kenyan milk, between 2003 and 2009 there was no trade in milk between Zambia and Kenya. In 2010, Kenya milk exports to Zambia amounted to US$6,161 with no trade thereafter. The NTB has resulted into more extra-COMESA trade in milk, for the period 2010-2015, Zambia's intra-COMESA milk imports accounted for 0.9% while extra-COMESA imports accounted 99.1%.

b) Rules of Origin on pure palm based cooking oil between Zambia and Kenya

Pure palm based cooking oil exported by Bidco in Kenya was denied entry into Zambia in 2011. The company paid US$25,000 as security to allow delivery of the consignment into Zambian market, which has not been refunded to date. In the same year, 12 trucks carrying pure palm based cooking oil valued at US$ 504,000 was denied entry on the basis that the COMESA and SADC Certificates of Origin were not genuine. The company was asked to pay US$ 10,500 per truck as security to allow for delivery of the goods. The company could not pay the requested amount and the consignment was held for 3 months at Nakonde border. This affected the shelf life of the product resulting into a loss of US$504,000 in addition to storage and costs of offloading the trucks. It is estimated that the company is losing a potential market valued at US$ 3 million per annum.

The NTB has resulted into loss of market for Kenyan pure palm based cooking oil. Zambia pure palm-based cooking oil imports from Kenya amounted to US$ 6.8 million accounting for 40.2 % in 2003. After imposition of NTB in 2003, the value of imports declined to US$3.9 million in 2004 and US$54,000 in 2005 accounting for 0.32% with

the decline continuing upto 2009.By 2015 Zambia imports from Kenya amounted to US$143,000 and accounted for 0.31% of the total imports.

The NTB has also led to a reduction of intra COMESA trade, for the period 2003-2015, Zambia's intra-COMESA imports of pure palm-based cooking oil accounted for 8.2 % while extra-COMESA imports accounted for 91.8%. South Africa and Singapore accounted for 50% and 31% of the total imports respectively.

c) Import licensing requirements for a variety of products between Zambia and Zimbabwe

The import licensing caused delays in importation of raw materials, which affected the manufacturing processes in Zimbabwe as well as exports of Zambian milk products. Milk traders are required to export through an agent based in Zimbabwe failure to which a commission of US$ 0.3 per litre is charged. This has resulted into increase in milk prices affecting its competitiveness in the Zimbabwean market. The NTB has also led to loss of investments and jobs in Zambia. Some of the companies which were producing products in Zambia have relocated to Zimbabwe, for example, Trade Kings has invested in a state of the art detergent plant valued at US$15 million.

d) Rules of Origin on ceramic tiles between Sudan and Egypt

The NTB has led to loss of investments and market for the industry however the firms in the building materials industries have not done an analysis of the actual costs of the NTB due to the short time that the NTB has been in existence.

e) Import licensing on products from Zambia to Malawi

The import licensing led to smuggling of cement along the Mchinji border especially by small scale traders through the use of bicycles due to cumbersome processes of acquiring the import license resulting into loss of revenue for the government. The process of acquiring the import license is cumbersome and adds to the cost of doing business.

f) Government policy and regulations between Uganda and Burundi

The NTB has led to high cost of doing business for the private sector in Burundi. In case a Burundian truck is involved in an accident, the Uganda Police usually request the driver of the truck to compensate the third party without due regard to the Yellow Card. This causes delays as drivers wait for truck owners to send money and increases the cost of transport.

g) Issues related to Rules of origin on sugar between Kenya and Mauritius

The NTB led to the following costs for the Mauritius Sugar Syndicate (MSS): payment of US$ 1.6 million as security to Kenya Revenue Authority to allow for delivery of sugar into Kenyan market; storage charges; loss of market where some buyers bought sugar from other sources to fulfil their commitments; reluctance by some buyers to buy sugar from MSS affecting the prices of sugar; and uncertainty in future contracting.

h) Surtax on all imported products that are produced or manufactured in Zambia between Zambia and Kenya.

The surtax has led to a reduction in tilapia imports for Lake Kariba Harvest Commercial Ltd. Tilapia imports for the period January-May 2016 amounted to 1.7 million tonnes valued at K 39.9 million compared to 0.9 million tonnes for a similar period in 2017, valued at K22.6 million. The firm pays on average K90,000 per week as surtax. The margin per kilogram of fish has fallen by over 30% except for fillet which is hard to procure and is not the firm's main product. These have affected the operational cashflow of the firm. The firm has set up a fish feeds manufacturing plant in Siavonga valued at US$3.8 million. Some of the raw materials are imported from South Africa and are subject to surtax making the feeds less competitive.

The introduction of surtax has also led to reduction of the value of margarine exports by Bidco in Kenya to Zambia from US$ 360 million to US$ 60 million per month resulting into loss of a market valued at USD$ 300 million per month.

5.0 Conclusions and Policy Recommendations

5.1 Conclusions

Despite the increase in intra-COMESA trade, its proportion to global COMESA exports is low. One of the factors attributed to low intra-regional trade is the existence of non-tariff barriers.

The most prevalent NTBs include customs and administrative entry procedures, transport, clearing and forwarding and specific limitations. The top five countries imposing and reporting NTBs are; Zimbabwe Kenya, Malawi, Zambia and Uganda. Comoros, Djibouti and Libya did not impose any NTB.

The online mechanism for reporting, monitoring and eliminating NTBs, was found to have the following shortcomings, misclassification of some of the reported/imposed NTBs, provision of general information on some of the products affected by NTBs making it difficult to identify the products, incomplete information on details of particular NTBs, double entry of some of the NTBs and delay in updating of the system after resolution of NTBs.

It was further observed that resolution of the outstanding NTBs does not adhere to the timeframes set in COMESA Regulations on Elimination of NTBs. The regulations provide for 135 days for resolution of NTBs however seven of the outstanding NTBs have remained unresolved for more than 135 days. Most of the Member States do not provide advance notification on introduction of new NTMs which impact negatively on intra-COMESA trade.

The causes and costs of the outstanding NTBs are:

i. The technical barrier to trade on UHT milk between Zambia and Kenya was caused by importation of milk from Kenya without the necessary import licenses and the existence of different standards of raw milk used in making UHT milk. Zambian Government has invested in the dairy sector through trainings and provision of cooling facilities hence there is a deliberate effort to protect the Zambian dairy farmers. The NTB has led to loss of market for Kenyan milk.

ii. The NTB on Rules of Origin on pure palm based cooking oil between Zambia and Kenya was caused by the need to protect the Zambian palm based cooking oil industry which was at an infant stage. The NTB has affected Bidco through loss of market.

iii. Import licensing between Zambia and Zimbabwe was due to poor macroeconomic conditions prevailing in Zimbabwe which had affected the manufacturing industry negatively. The NTB led to loss of market for Zambian milk.

iv. Rules of Origin on ceramic tiles between Sudan and Egypt, has led to loss of investments and market for firms in the building materials industries.

v. The introduction of Import licensing on products from Zambia to Malawi was meant to protect the local industries producing similar products. The NTB led to smuggling of cement along Mchinji border resulting into loss of revenue for the government. The NTB was resolved on 17 May 2017.

vi. The denial of entry of Zambian trucks into Malawi was due to lack of import licences and smuggling of cement into Malawi. The cumbersome process of acquiring the import license adds to the cost of doing business. The NTB was resolved on 17 May 2017.

vii. Additional taxes and other charges between Zambia and Malawi was meant to cater for border allowances for employees working at the border. The NTB was resolved on 17 May 2017.

viii. Government policy and regulations relating to non-recognition of COMESA Yellow Card by Uganda between Uganda and Burundi, was due to low third party liability cover in case of death and delays and bureaucracy in the claim process. It has led delays and increase in cost of transport thereby increasing the cost of doing business for private sector in Burundi. The NTB was resolved in December 2016.

ix. Issues related to Rules of origin on sugar between Kenya and Mauritius, were due to misinterpretation of the Protocol on Rules of Origin. The NTB led to security and storage charges, loss of market and uncertainty in future contracting in Mauritius. The NTB was resolved in June 2017 during on the spot verification mission.

x. Imposition of surtax on all imported products that are produced or manufactured in Zambia between Zambia and Kenya, was to encourage local sourcing of inputs into the manufacturing sector in order to reduce the cost of production and to raise revenue for the government. The surtax has had negative effects on Zambian manufacturing sector. It has also led to a reduction in tilapia imports and profits for Lake Kariba Harvest Commercial Ltd and loss of market for margarine by Bidco in Kenya.

xi. Prohibition of importation and transit of selected logs through Zambia between Zambia and Democratic Republic of Congo. The NTB was meant to prevent illegal harvesting and trade in endangered tree species. The NTB was reported as resolved however according to the NTB online reporting mechanism, the NTB was in the process of being resolved as at 18 July 2014.

5.2 Policy Recommendations

Based on the study findings, the following are the policy recommendations.

Main Policy Recommendations

a) COMESA should adopt a preventive approach in dealing with NTBs. The Council should recommend to the Authority to impose sanctions as may be appropriate against a Member State that do not provide notifications before introduction of NTMs.

b) COMESA should harmonize SPS measures through implementation of the COMESA Green Pass (CGP) to facilitate trade in agricultural products.

c) Member States should adhere to the NTB resolution time frames set out in the COMESA Regulations on Elimination of NTBs to ensure timely resolution of NTBs and enhance intra-regional trade.

d) There should be periodic audit/review of the COMESA- EAC-SADC online mechanism for reporting, monitoring and eliminating NTBs to ensure correct and uptodate record for easy follow up of NTBs.

e) The National Focal Points should sensitize the private sector on the NTB reporting mechanisms and COMESA Regulations on Elimination of NTBs.

f) The National Monitoring Committees(NMCs) should provide quarterly reports on NTBs to ensure implementation of the COMESA time bound matrix and timely resolution of NTBs.

Other Policy Recommendations

a) Zambia should recognize the graded milk standards applicable in Kenya and allow processors that meet the required standards to export their milk.

b) COMESA should consider establishing a COMESA Dairy Regulatory Authorities Council to address regulatory issues and NTBs in the dairy sector.

c) Kenya and Zambia should fast truck resolution of the NTBs on UHT milk and pure palm based cooking oil during bilateral meetings scheduled for August 2017.

d) Zimbabwe should apply for a safe guard and allow for quotas on the deficit for Member States.

e) The government of Zambia should consider providing a tax holiday for 18-36 months to allow local fish firms to readjust and strategize their businesses for local production or reduce the surtax to about 1.5-2.5 %.

f) Zambian government should abolish application of surtax on COMESA originating products.

g) The National Bureaux of Uganda should review the third-party liability cover upwards to ensure adequate cover for the holder and victims and the COMESA

Yellow Card should be computerised to ensure effective and speedy resolution of claims.

h) The Secretariat should undertake continuous capacity building on Rules of Origin to Member States.

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REVENUE IMPLICATIONS OF CONTINENTAL FREE TRADE AREA:

A MALAWIAN PERSPECTIVE

Michael Masiya

Abstract

The study estimates the tax revenue implications of Malawi joining the Continental Free Trade Area (CFTA) using a traditional buoyancy Model on disaggregated trade data. The results show that African imports have a positive impact on Malawi's trade taxes. The results further show that Malawi is likely to benefit from joining the CFTA through trade creation. However, revenue losses are imminent and more pronounced for capital goods. The study recommends that Malawi should join the CFTA and liberalize while keeping 15 percent of tariff lines for sensitive products and excluded products over a period of 10 years. The exclusion list should contain a significant amount of capital goods to minimize the negative revenue impacts.

1.0 Introduction

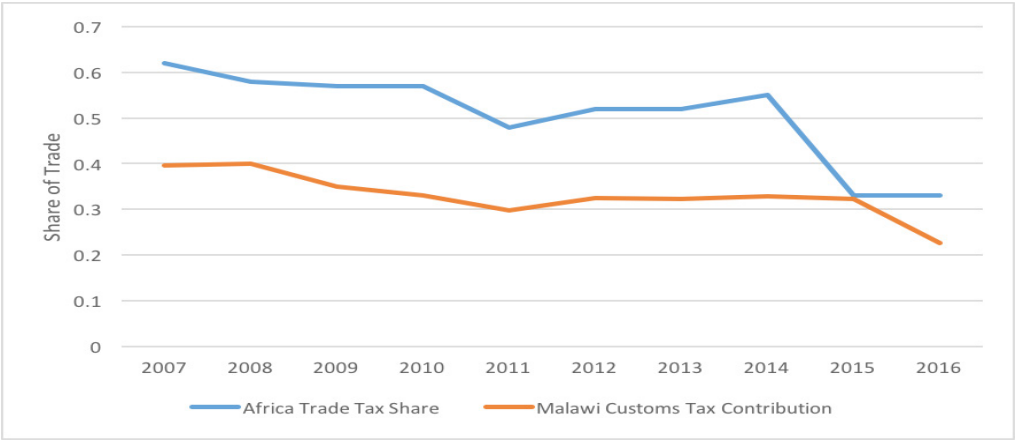
The Common Market for Eastern and Southern Africa (COMESA) along with other Regional Economic Communities (RECs) are making strides towards the eventual achievement of the Continental Free Trade Area (CFTA). The CFTA is envisaged to bring together fifty-four African countries with a combined population of more than one billion people and a combined gross domestic product of more than US $3.4 trillion (TRALAC, 2017).

The aim of the CFTA is to create a single continental market for goods and services. The CFTA is expected to enhance competitiveness at the industry and enterprise level through exploitation of opportunities for scale production, market access and better reallocation of resources (TRALAC, 2017). According to the African Union (2016), the CFTA will be a solution to the challenges of multiple and overlapping memberships and will facilitate a continental integration process.

The joining of a free trade area calls for the liberalization of tariffs at some point. There is a growing consensus for all countries, particularly developing countries, to adopt liberalized trade regimes because it was one of the catalysts in the rapid growth of many Latin American countries in the late 1980s and 1990s (Epaphra, 2014). However, Matlanyane & Harmse (2002) observed that trade revenue is impacted by tariff liberalization even though the direction of change is ambiguous. They argued that lower tariffs due to liberalization may lead to lower marginal benefit to evade taxes hence, lead to a rise in trade revenues. On the other hand, trade tax revenues may decline depending on elasticity of tariff revenue with respect to tariff rates.

Much as the CFTA is expected to increase trade flow among African countries, the customs revenue implications have far-reaching effects. This is partly because trade taxes still remain a huge source of tax revenues in Sub-Saharan Africa (Kassim, 2016). Trade with African countries, on average, contributed 51 percent of Malawi's trade tax revenues and 33 percent of the customs revenue to the gross tax revenues for the period 2007-2016 as shown in Figure 1. This is higher than the African average estimated for a decade prior to the year 2004 which stood at 28 percent of total current revenues (Economic Commission for Africa, 2017).

Figure 1: Share of Malawi-Africa Trade and Malawi's Trade Tax Share



Source: Republic of Malawi, National Statistical Office (NSO) and Malawi Revenue Authority (MRA)

Liberalization of tariffs may come at a cost such that the country has to weigh between reduced trade revenues and increased trade volumes in form of exports. The benefit is likely to be realized in the long-run but in the short to medium term, tariff liberalization is expected to lead to a reduction in customs revenues (Matlanyane & Harmse, 2002). If the fall in trade taxes is not compensated by a rise in other taxes especially domestic indirect taxes, then the liberalization would result in a huge cost exacerbated by high reliance on customs revenues (Epaphra, 2014).

It is against this background that we attempt to estimate the revenue implications that may arise from joining the Continental Free Trade Area (CFTA). This study is important because other African countries that rely on customs revenues may be uncertain of the revenue implications of joining the CFTA. Hence, the findings of this study are intended to help Malawi and other countries make informed decisions on the CFTA.

Objectives

The main objective is to estimate the revenue implications of Malawi joining the CFTA. More specifically the study sought to:

i. Estimate the impact of African Imports on Malawi's trade tax revenue

ii. Estimate the revenue gains or losses arising from joining CFTA

iii. Estimate the trade creation effect of joining the CFTA

2.0 Review of Literature

Theoretical Literature

The theory explaining the link between tariff liberalization and tax revenues is not cast in stone ((Kassim, 2016) & (Suliman, 2005)). In the short to medium term, trade liberalization policy is expected to reduce customs revenue due to lower tariffs (Matlanyane & Harmse, 2002). On the other hand, when tariffs are reduced, imports will become cheaper and volume of imports will expand hence, the tax base will rise as well (Epaphra, 2014). The same effect can take place through another channel. The lower tariffs due to liberalization may lead to a reduction in tariff evasion by lowering the marginal benefit to avoid taxation thereby more importers declaring their imports hence, an increase in import tax revenues (Matlanyane & Harmse, 2002). Therefore, the impact of trade liberalization on trade revenues is bi-directional. In theory, the ultimate impact may depend on import price elasticity and type of imports (for instance, capital goods unresponsive to price changes) and the share of trade revenue in total revenue (in developing countries, this is a significant share) (Matlanyane & Harmse, 2002). From Zafar (2005), the trade creation equation is given as follows:

$$TC_{ijk} = M_{ijk}\alpha_i^m \frac{dt_{ijk}}{\left(1+t_{ijk}\right)\left(1-(\alpha_i^m/\gamma_i^m)\right)} \quad (1)$$

Where TC_{ijk} is the sum of trade created in millions of dollars over i commodities affected by tariff change and α_i^m is the elasticity of import demand for commodity i in the importing country from the relevant trading partner. M_{ijk} is the current level of import demand of the given commodity i, while t_{ijk}^0 and t_{ijk}^1 represent tariff rates for commodity i at the initial and end periods respectively. Determinants of trade creation include current import level, import demand elasticity, and the relative tariff change. Trade creation occurs when there is a shift from higher cost producer to lower cost producer because of elimination of tariffs on imports from the partner. On the other hand, trade diversion results when an efficient producer from outside the free trade area is displaced by less efficient producers in the preferential area. In terms of revenue implications, the difference between the revenue after the tariff change, R_1 (with rate t_{ijk}^1) and the revenue before the tariff change, R_0 (with rate t_{ijk}^0) gives the revenue loss or gain as follows:

$$RI = R_1 - R_0 \tag{2a}$$

Where RI = Revenue Implication

$$R_1 = \sum_i \sum_k t_{ijk,}^1 P_{ijk,} M_{ijk}$$

$$R_0 = \sum_i \sum_k t_{ijk,}^0 P_{ijk,} M_{ijk}$$

Hence,

$$RI = \sum_i \sum_k \Delta t_{ijk,}^0 P_{ijk,} M_{ijk} \tag{2b}$$

This is the equation which is simulated in the SMART Model of the World Bank when estimating revenue implications of a tariff change.

Empirical Literature

Several studies have examined the revenue impact of trade liberalization and others have attempted to evaluate overall, how regional integration has impacted trade.

Matlanyane & Harmse (2002) using annual time series data from 1974 to 2000, estimated an Ordinary Least Squares Tax Buoyancy Model for South Africa. They found that the volume and value of imports increased owing to liberalization while import tax revenue declined due to lower tariffs. They concluded that a sound macroeconomic environment is a prerequisite for successful trade liberalization.

Epaphra (2014) used cointegration analysis to examine the revenue implications of trade liberalization in Tanzania, over the period 1979/80 to 2009/10. The findings show that total tax revenue as a share of Gross Domestic Product (GDP) has declined because of the inability of Tanzania to strengthen the domestic taxes as a means of recovering from customs revenue loss due to liberalization. The study concludes that trade liberalization results in reduced import duty revenue thereby culminating into fiscal challenges if appropriate steps are not taken to strengthen the domestic tax system.

Kassim (2016) analyses the revenue impact of trade liberalization for 28 countries in Sub Saharan Africa over the period 1981 to 2010.The study used different panel data methods including Generalized method of Moments (GMM). The study concluded that the net effect of adopting freer trade reforms significantly increased total tax revenue in Sub-Saharan Africa. This result is also shared by Suliman (2005) in analyzing the impact of trade liberalization on revenue in Sudan.

Korinek & Melatos (2009) assessed the trade impact of selected regional trade agreements in agriculture, and found that there was increased trade in agriculture for COMESA Member States. They further found that there was no trade diversion with respect to imports from outside the region.

Darku & Appau (2015) analyzed the impact of regional trade agreements to Sub-Saharan Africa trade using the dynamic gravity model. The study found that creation of COMESA, ECOWAS and SADC led to significant increase in trade among Member States while creation of ECCAS had a negative impact on both intra-ECCAS and extra-ECCAS bilateral trade flows.

From the literature review, most of the studies have shown little or no increments in trade within members of a REC. This study attempts to draw lessons from the data to simulate the likely trade creation and revenue implications of joining the CFTA.

3.0 Methodology

3.1 Econometric Model

This study estimated the traditional buoyancy and elasticity model adopted from (Leuthold & N'Guessan, 1986), (Osoro, 1993), Wawire (2000) to determine the impact of imports from African countries on Malawi's trade tax revenues. Tax buoyancy and elasticity are the commonly used measures of tax productivity but the elasticity of a tax is difficult to measure as it requires estimation of discretionary changes while buoyancy does not control for discretionary changes in tax policy (Osoro, 1993). Hence, due to the challenges in estimating the discretionary changes, we use the traditional buoyancy model.

The global buoyancy of a tax system is usually measured by the proportional change in total tax revenue with respect to proportional change in the tax base (Suliman, 2005) and is presented as follows:

$$B_{TR,TB} = \frac{\partial TR}{\partial TB} \cdot \frac{TB}{TR} \qquad (3)$$

Where TR is tax revenue and TB is the tax base. Equation (3) can also be expressed as follows:

$$TR = \alpha TB^{\gamma} \varepsilon \qquad (4)$$

The empirical model obtained by expressing equation (4) in double-log is expressed as follows:

$$\ln TR_t = \alpha + \gamma \ln TB_t + \varepsilon_t \quad (5)$$

Where

TR_t is the tax revenue

α and γ are coefficients

TB_t is the tax base

ε_t is the error term which is assumed to follow the standard one-way error specification presented as $\varepsilon_t = \mu_t + \nu_t$

We ran a set of equations each with a separate tax type belonging to customs revenue category but with a common base represented as Value for Duty Purposes (VDP) for Malawian imports from African countries. We estimated the following models:

$$\ln \text{Imp\_}Duty_t = \beta_0 + \beta_1 \ln VDP\_Africa_t + \varepsilon_t \quad (6)$$

$$\ln \text{Imp\_}Excise_t = \delta_0 + \delta_1 \ln VDP\_Africa_t + \varepsilon_t \quad (7)$$

$$\ln \text{Imp\_}VAT_t = \lambda_0 + \lambda_1 \ln VDP\_Africa_t + \varepsilon_t \quad (8)$$

$$\ln \text{Trade\_}Tax_t = \theta_0 + \theta_1 \ln VDP\_Africa_t + \varepsilon_t \quad (9)$$

Where the variables Imp_Duty, Imp_Excise, Imp_VAT mean Import Duty, Import Excise and Import VAT respectively. Trade_Tax is the sum of Import Duty, Import Excise and Import VAT which represents total tax revenue collected from imports into Malawi.

3.2 Data Type and Sources

The study used monthly data from January 2007 to December 2016, to determine the impact of Africa imports on Malawi's trade taxes. The trade data was sourced from Malawi National Statistical Office (NSO) and is highly disaggregated with eight-digit Harmonized System (HS) code and commodity descriptions. The data has Cost Insurance Freight (CIF) values which are converted to VDP values using the exchange rate of the day. The subsequent taxes are calculated using applicable tariff rates for the commodity at the eight-digit tariff level.

4.0 Results and Discussions

4.1 Descriptive Statistics

The descriptive analysis based on VDP is shown in Table 1 in the Annex. We rank product categories from Africa and examine their contribution to the VDP of Malawi and narrow down on the top 10 categories of products from Africa in terms of VDP.

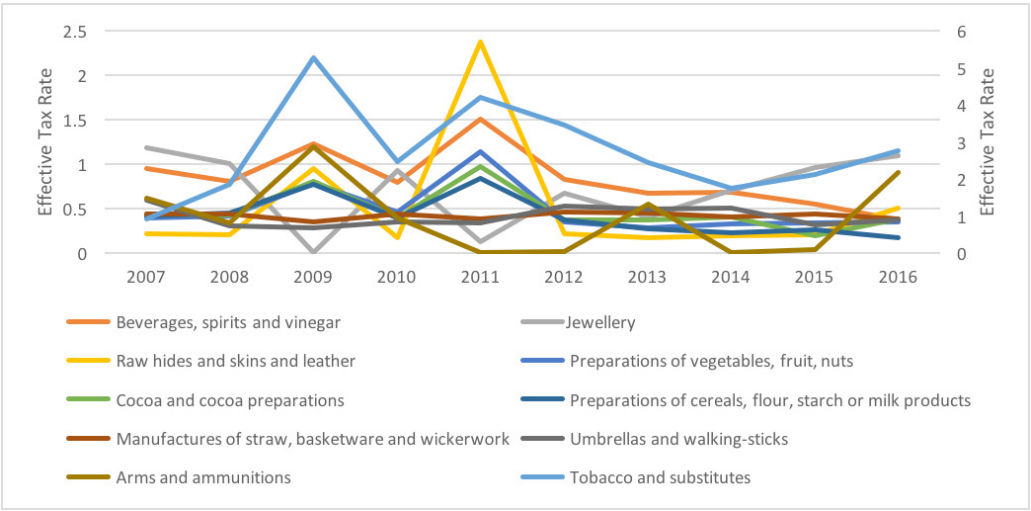
Mineral fuels top the list while iron and steel come last. The top three categories of products are highly dutiable products while the middle-three are mainly duty-free commodities which are geared towards improving critical sectors of the economy such

as agriculture and health. The list of product categories ranked in terms of trade tax revenue contribution is shown in the annex as table 2. This gives a rough idea of what products Malawi is likely to give up quickly for liberalization.

The top imports by value are not necessarily the top contributors of the trade tax revenue. All top 5 imports by value with an exception of vehicles, have changed their ranking with respect to trade tax revenue contribution.

We computed the effective tax rates to determine which product categories are taxed highly relative to their import value as shown in Figure 2

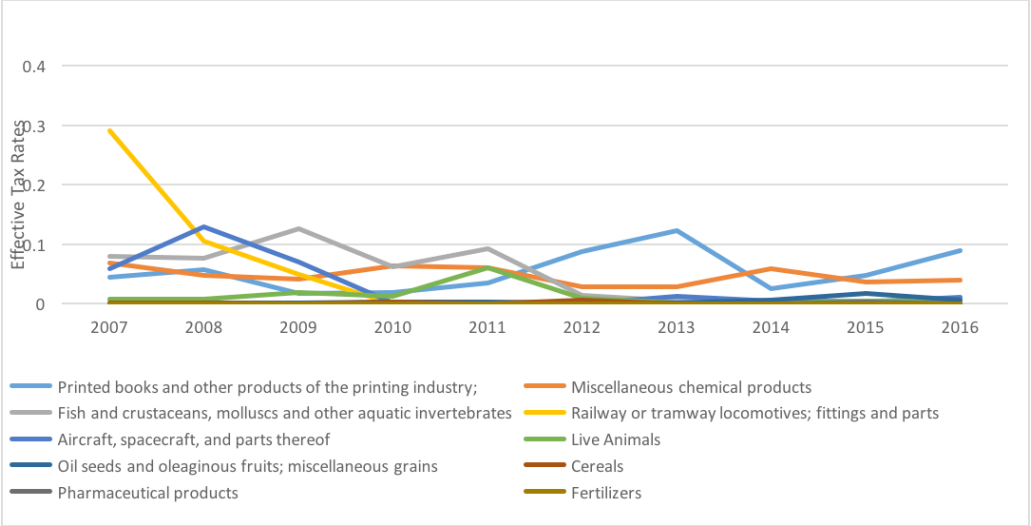
Figure 2: Effective Tax Rates by Top 10 Product Categories



Source: Author's manipulation using National Statistical Office (NSO) data

The effective tax rates of top 10 product categories over a 10-year period is shown in figure 2. The results show that most of the products which are taxed very highly are raw materials and products made from raw materials that are obtained locally. Taxing such products highly ensures that local farmers as well as infant industries are shielded from external competition. Tobacco is the most highly taxed to prohibit its consumption in addition to shielding the infant industry. Looking at the nature of such products, it would hardly be feasible for Malawi to fully liberalize as part of the CFTA agreement. The effective tax rates for the bottom 10 product categories is as shown in figure 3.

Figure 3: Effective Tax Rates by Bottom 10 Product Categories



Source: Author's manipulation using National Statistical Office (NSO) data

The products in the bottom 10 categories are meant to boost critical sectors of the economy such as Agriculture (Fertilizer, Chemical products for making fertilizers, Fish, Seeds and hybrid animals), Health (pharmaceuticals), Transport (Railway locomotives, Aircraft), Education (Books) and promote food security (cereals). Such products have zero tax rates on some lines or very low rates of duty. Such products would easily be given up for complete liberalization by the Malawi government in a trade agreement such as the CFTA.

4.2 Regression Results

In ascertaining the importance of African Imports to Malawi's trade taxes, we estimate the model described in Section 3. The results are presented in table 3.

Table 3: Regression output of African Imports relevance to Malawi

	Log of import duty	Log of Import excise	Log of Import VAT	Log of Total Tax
Log VDP	0.626***	0.392***	0.676***	0.600***
	(0.0197)	(0.0226)	(0.0185)	(0.0168)
_cons	6.511***	11.83***	5.820***	8.370***
	(0.469)	(0.537)	(0.440)	(0.400)
N	120	120	120	120
adj. R^2	0.894	0.716	0.918	0.915

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

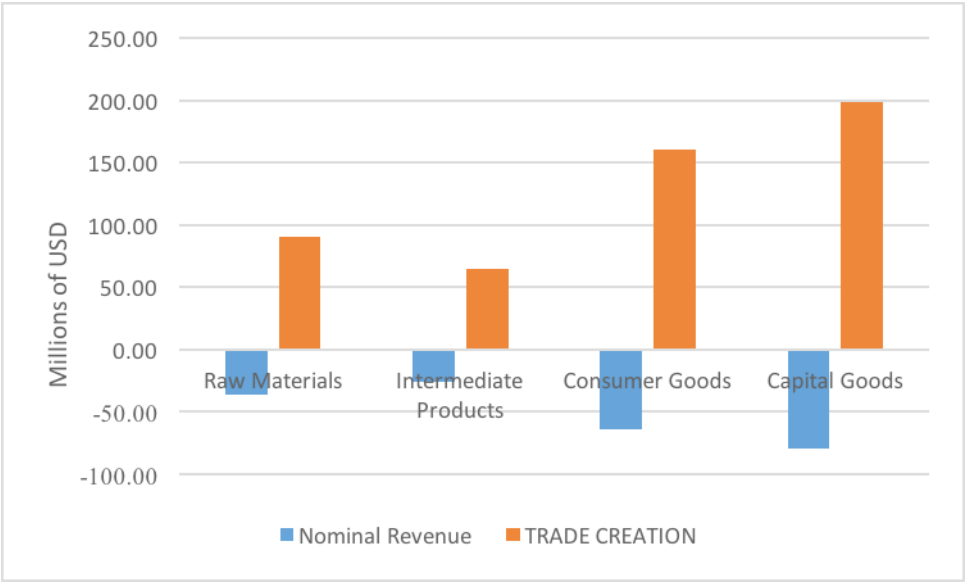
The regression results show the impact of African imports on trade taxes. African imports have an impact on each trade tax type in Malawi. The results show that a 10% increase in Africa import VDP leads on average to a 3.92% increase in import excise. Overall, African imports significantly impact on total Malawi trade taxes. Hence, we appreciate the crucial role that imports from Africa play in determining Malawi's taxes such that every decision to liberalize must be accompanied by a decision on how taxes will be impacted by the decision.

4.3 Results from Trade Liberalization Simulations

We used a SMART Model for trade simulation to estimate the revenue impact of Malawi joining the CFTA using data for 2016 for raw materials, intermediate and capital goods. We assumed a tariff rates' reduction to zero percent from the current rates by segmenting across various categories of products. We found that there is high revenue loss and high trade creation impact for capital goods. However, there will be less revenue loss for raw materials and least for intermediate goods.

Figure 4 shows nominal values of revenue impact and trade creation upon liberalizing all goods in the CFTA. The results show that while trade creation is positive and hitting as high as US$ 200 million, there is an imminent revenue loss of close to US$100 million upon liberalizing all tariff lines for the CFTA.

Figure 4: Revenue Impact and Trade Creation (Nominal values in Millions of USD)

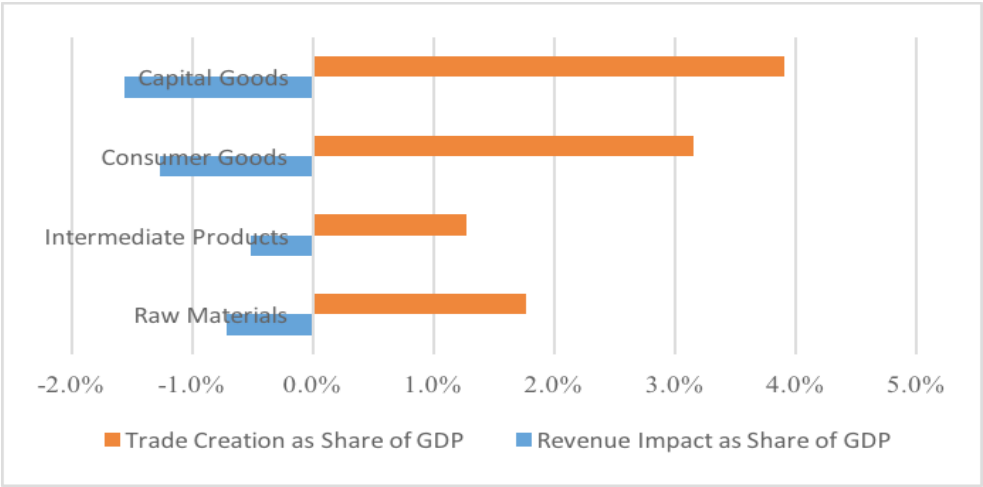


Source: World Integrated Trade Solution (WITS)

Figure 5 shows the revenue loss as a share of GDP for Malawi which ranges from -0.5 to -1.6 percent while trade creation as a percentage of GDP is from 1.3 to 3.9 percent. The gains are higher than Zafar (2005) which were within the range of 0.5 to 1.5 percent for various tariff regimes. This entails that Malawi stands to gain significantly from joining the CFTA through enhanced trade creation. Indeed, the fact that Malawi is a landlocked country, massive trade creation would be of significant value addition. However, the

trade creation is hardly accompanied by an increase in trade revenue.

Figure 5: Revenue Impact and Trade Creation (Shares of GDP)



Source: World Integrated Trade Solution (WITS)

The results point to revenue loss close to -2 percent of GDP for capital goods and less pronounced for intermediate goods at about -0.5 percent of GDP.

5.0 Conclusions and Policy Implications

5.1 Conclusions

The study found that imports from Africa are highly significant to Malawi's Trade tax revenues. Some products are crucial to revenue generation, promotion of crucial sectors in the economy and liberalizing tariffs on capital goods will have significant negative impact on tax revenues compared to raw materials and intermediate goods.

A potential caveat of the study is that the model used was a partial equilibrium model. This model ignores other potential sectors of the economy that would be affected by the ripple effects of trade creation. On the other hand, in a general equilibrium model, the trade creation gains would be transmitted to other sectors of the economy to estimate overall gain to all the sectors. This would form a comprehensive basis for a decision for a country like Malawi to join the CFTA.

5.2 Policy Implications

The study recommends that, in CFTA negotiations, Malawi and other countries that heavily rely on customs revenues should be given a longer period of liberalization such as 10 years' in addition to keeping a larger percent of tariff lines for sensitive and excluded products such as 15 percent, currently obtainable by a small group of Least Developing countries. This pegs the level of ambition at 85 percent. In terms of composition, the paper recommends that capital and consumer goods should constitute a higher proportion of the exclusion list due to their revenue-intensive nature.

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ANNEX

Table 3: Top 10 Imports from Africa by Product Categories (Millions of US Dollars)

Import Category	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Mineral Fuels	182.16	213.06	112.93	201.53	59.59	252.07	318.82	250.17	51.10	53.26
Machinery and Parts	37.44	68.64	94.20	70.98	61.20	49.68	80.89	125.40	55.85	37.15
Vehicles	39.85	68.42	96.79	53.27	63.12	52.01	63.82	77.97	49.47	41.89
Fertilizers	39.94	90.17	83.57	53.00	87.69	30.57	71.45	116.57	41.21	3.37
Cereals	3.17	10.92	49.93	8.10	24.35	1.35	19.50	36.30	53.17	105.20
Pharmaceutical products	8.48	10.45	78.56	9.42	61.92	13.19	14.62	159.69	26.39	2.33
Plastics	27.66	36.39	32.33	42.50	34.15	45.76	52.39	58.47	41.39	12.68
Plastering materials, lime and cement	25.18	25.16	27.00	66.22	36.15	47.61	62.14	42.88	29.60	15.65
Electrical machinery and Electronics	21.41	29.71	69.52	30.42	50.11	40.80	34.14	50.67	30.55	19.89
Iron and steel	33.46	45.30	23.90	40.09	25.64	35.43	44.42	42.91	25.17	11.07

Source: Author's manipulation using Malawi's National Statistical Office (NSO) data

Table 4: Top 10 Import Taxes from Africa by Product Categories (Millions of US Dollars)

Import Category	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Vehicles	67.44	79.01	77.56	75.45	32.26	46.58	51.71	44.44	11.74	12.29
Plastics	11.50	17.32	15.79	14.74	18.15	12.83	14.68	26.73	13.00	11.01
Tools made of base metal	5.27	12.31	13.02	15.85	13.22	12.87	12.85	4.96	4.26	6.14
Articles of iron or steel	5.96	7.43	5.69	7.73	7.63	6.88	7.37	10.17	7.50	2.42
Ceramic products	6.26	5.55	5.10	5.80	6.59	7.39	6.36	9.59	5.97	4.10
Wood and articles of wood	6.90	6.94	7.05	7.24	8.25	6.33	5.76	7.55	6.01	4.07
Machinery and Parts	6.30	7.76	6.30	7.84	7.12	4.52	4.31	6.18	3.85	1.70
Glass and glassware	3.86	3.10	5.23	8.22	6.90	4.25	3.20	3.79	2.98	2.04
Miscellaneous man-ufactured articles	3.17	3.78	4.21	4.91	4.96	3.50	3.30	3.73	4.90	1.73
Electrical machinery and Electronics	2.06	3.15	2.60	3.25	5.51	3.51	3.20	5.24	3.78	1.63

Source: Author's manipulation using Malawi's National Statistical Office (NSO) data

INSTITUTIONAL QUALITY AND TRADE: **THE CASE FOR COMESA REGION**

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Abstract

This paper investigates the determinants of exports using the gravity trade model with random effects for 19 COMESA member states, for period 2000-2015, with an institutional perspective. Controlling for traditional determinants of trade, four governance indicators were chosen to measure institutional quality: corruption, government effectiveness, regulatory quality and rule of law. The empirical results provide evidence that presence of corruption significantly reduce exports; improvements in government effectiveness is associated with increased exports; improved regulatory environment positively significantly facilitates increased levels of exports, deterioration in the rule of law seems to be working against improved exports of the COMESA member states. The results also provide confirmation that abiding by the WTO principles of trade liberalisation and becoming more outward oriented significantly increases export capacity. Therefore, COMESA member states need to undertake institutional reforms to improve institutional quality and thus stimulate economic growth and trade.

1.0 Introduction

International trade theories failed to recognise the role of institutions in determining trade between and across political and economic entities. Their emphasis gravitate towards factor endowments, technology, tastes and preferences, and nature of competition as key determinants of international trade. The birth of New Institutional Economics (Williamson, 1985, Coase, 1998) brought to the attention of many scholars the need to investigate the link between institutions and trade. North (1991:97) argued that institutions determine transaction costs, profitability and feasibility of economic activities, therefore a collective impact of institutions, technology, tastes and factor endowments determines actual magnitude and direction of trade at each given time. A couple of empirical studies (Hall and Jones, 1999; Anderson and Young, 1999; Bigstein et-al, 2000; Anderson, 2001; Anderson and Marcouiller, 2002; Rauch and Trindade, 2002; Dollar and Kraay, 2002; Gilbert, 2002; De Groot et-al., 2004) started to examine direct effects of institutions on bilateral trade flows. The conclusion stemming from the literature is that countries with better institutions are likely to trade more.

Although previous researches concurred on the role played by institutions in stimulating exports, the relations between institutions and trade remains ambiguous. This paper intends to solve this puzzle by investigating the relationship between institutional quality and trade in the context of the Common Market for Eastern and Southern Africa (COMESA) region. COMESA region has not been the subject matter regarding the relationship between institutional quality and trade, even though most of the countries in the region suffer from poor institutional infrastructure (*see Table 1*). Many countries in the COMESA region are characterised by poor export performance, balance of trade deficit, low levels of growth, and relative poverty resulting from narrow investments (Comstat, 2017).

Relative to other Regional Economic Communities (RECs) in Africa, COMESA has been ranking number three on intra-regional trade, following Sothern African Development Community (SADC) and Economic Community of West Africa States (ECOWAS) (Comstat, 2017). There are also poor social and economic infrastructure and high production costs in the region which have thwarted financial incentives to lure more foreign direct investments that drive growth. In addition, several countries in the region are struggling to improve institutional infrastructure as they are constrained by insufficient public expenditures (Ngwenya, 2015).

The emphasis of COMESA countries on trade as the key engine for growth requires that they develop appropriate institutions that support both regional and global integration of countries. The facts regarding the quality of institution in the region point to the need for improvement in order to boost both intra and extra COMESA trade. Osabuohien and Efobi (2011) documented that COMESA ranks number 4 on the institutional quality of regulatory quality, following after SADC (1), ECOWAS (2) and East African Community (EAC) (3). The percentile rank for all the six indicators of governance (political stability, voice and accountability, control for corruption, government effectiveness, rule of law and regulatory quality) for COMESA region are below 40 (Worldwide Governance Indicators, 2017). Institutions where corruption prevails inevitably depress competition and trade facilitation in the region. COMESA successfully established a Free Trade Area (FTA) in October 2000 with the aim of promoting regional integration through zero customs tariffs on goods traded among member states. In addition to FTA, appropriate and quality institutions in respective countries would improve intra-COMESA trade and foreign direct investment in the region. More so, the development of appropriate institutions would

also help in the reduction of capacity gaps that rendered implementation of agreed obligations in member states slow. Efficient institutions will also catalyse the envisioned progress to a Common Market and eventually to a full Economic Community by 2025.

0.1 Problem statement

The role of institutional quality on export promotion has generated a lot of exciting debate among scholars, but the interaction between trade and institutional quality has remained ambiguous. On one hand, institutional quality can play a significant role in reducing overall cost of trade across countries and regions since reducing the cost of transportation to local and foreign markets can be a strong incentive for exporters. Institutional quality improvement can affect trade through the development of regional market size which can improve export potential, reduce tariffs and develop infrastructure that can considerably reduce transaction cost of trade. On the other hand, Anderson (2001) suggests that the ineffective institutions hinders international trade through increasing of both transaction costs and risks of trading internationally. To this end, the effects of institutional quality and export flows requires a close analysis of the changes in particular countries and regions. It is therefore against this backdrop that this study seeks out to analyse the effects institutional quality on export flows, from a viewpoint of developing countries. In particular, the study analyses the effects of institutional quality on intra-COMESA and extra-COMESA export flows.

1.2 Objectives

The main aim of this paper is to provide empirical evidence on the effects of institutional quality on trade flows in the COMESA region, by examining the effects of quality of institutions on exports. The following specific objectives were:

i. To identify the patterns of institutional quality and export flows in the COMESA region

ii. To analyse the effects of institutional quality on export flows in the COMESA region

iii. To give the policy implications in relation to the interaction between institutional quality and trade in the COMESA region.

1.3 Research Questions

The specific questions this paper set out to answer are:

i. What are the patterns of institutional quality and export flows in the COMESA region?

ii. How do institutional factors explain export flows in the COMESA region?

iii. What policy implications can be drawn?

2.0 Institutional quality and Trade in the COMESA region

Several studies have pointed out that the quality of institutions has a strong impact on a country's competitiveness and economic growth. Anderson (2001) argue that ineffective

institutions can hinder trade, and Anderson and Marcouiller (2002) postulate that bad institutions can negatively affect volumes of trade by increasing both transaction costs and risks of trading internationally. This section analyses the quality of institutions and trade performance in the COMESA region.

2.1 Quality of institutions

"Institutions are rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction" (North 1991:3). They structure incentives in human exchange and shape the framework that facilitates economic transactions. Effective institutions are expected to reduce transaction costs and improves the security of international exchange. Weak institutions, on the other hand, have impeding effects on maximising the gains from trade. Ngwenya (2015) mentioned that weak institutions and poor policies are among key factors hindering growth of agricultural trade in the COMESA region through limiting market access and demand driven intra-regional trade expansion. Unclear property rights and uncertainties around intra-COMESA exchange relations have persistently reduced the traders' access to markets and their incentive to invest. In addition, unharmonised policies in the region are also affecting trade, through imposing tedious trade processes which include unnecessary delays in crossing borders due to inefficient customs service and onerous documentary requirements (Ngwenya, 2015). These unplanned and ad hoc policies by governments tend to distort markets, depress competition and negatively affect regional integration endeavours.

Even though institutions matter, it can be hard to measure quality of institutions because various aspects of institutional infrastructure are determined with ambiguity. To address this lacuna, this study adopts the Worldwide Governance Indicators (WGI) as variables to measure institutional quality. The WGI consist of six composite indicators of broad dimensions of governance covering over 200 countries since 1996. These indicators include: Political Stability and Absence of Violence or Terrorism, Voice and Accountability, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. These indicators are based on various variables obtained from different data sources, capturing governance perception as reported by survey respondents, commercial business information providers, non-governmental organisations and public sector organisations.

In the COMESA region, countries are striving to improve the institutional infrastructure, but are constrained by lack of sufficient public expenditure in this region. A relative analysis of the percentile rank for political stability and absence of violence/ terrorism made shows that Comoros, Djibouti, Egypt, Ethiopia, Kenya, Libya, Madagascar, Mauritius, Seychelles Swaziland and Zimbabwe experienced deterioration in the institutional quality for political stability during the period 1996 to 2015.Table 1 shows that there are high levels of political stability in Seychelles and Mauritius with rankings way above the median of 50%. Comoros, Egypt, Madagascar, Libya, Kenya and Seychelles experienced sharp declines with the margins of 16.5%, 18%, 15.4%, 14.1%, 12.7% and 13.5%, respectively. Zimbabwe suffered a marginal decline of 2.3% points during the same period 1996-2000, from 28% to 25.7%. These are worrying changes, which are attributable to weak forms of political governance, state failure, imperialism, civil wars, military intervention, contested election outcomes and non-democracies as well as intensification in political violence in the region. Regrettably, these challenges affect trade and other macroeconomic variables that are key for economic growth and development.

The aggregate of voice and accountability examines the institutional quality of press

and media freedom. The rankings of COMESA countries are very much alarming. Zimbabwe, Djibouti, Eritrea, Madagascar and Seychelles experienced significant decline in the institutional quality of voice and accountability. Although Mauritius experienced a marginal decline of 0.7%, it is the top performer in the institutional quality indicator of voice and accountability. For the 19-year period, there are variations in the degrees of declines ranging from significant to marginal. The following are the countries that recorded marginal decline in the institutional quality of voice and accountability: Swaziland (2.2%) and Ethiopia (0.6%). Countries like Burundi, DR Congo, Kenya, Rwanda, Uganda and Zambia have recorded remarkable improvements in the institutional quality of voice and accountability. The percentile rank for voice and accountability for Kenya, Rwanda and Burundi have increased by 13.5%, 10.9% and 10% respectively.

The Worldwide Governance Indicators show that most of the COMESA countries are striving to improve institutional quality for government effectiveness between 1996 and 2015. Government effectiveness captures the perceptions of quality of public services, quality of civil service and degree of independence from political pressures, quality of policy implementation, and credibility of government's commitment to such policies. On government effectiveness, Rwanda, Ethiopia, Zambia, Mauritius and Uganda have remarkably improved, with the following margins: 40.2%, 22.5%, 19.5%, 17.4% and 12.6 respectively. Zimbabwe, Egypt, Madagascar and Libya experienced sharp decline in the institutional quality for government effectiveness, with the margins of 35.8%, 25.7%, 22.6% and 17.1% respectively. The deterioration in the institutional indicator for government effectiveness in most COMESA countries implies that there is policy inconsistence, lack of commitment by the governments and high political interference in the region.

The percentile rank of regulatory quality (Table 1) shows that Mauritius and Rwanda are the top performers in the region with 82.2% and 60.6% respectively. Libya is the worst performer of the region with the percentile rank of 0.48%. In the region, countries like Rwanda, Mauritius and Burundi have remarkably improved on policy formulation and implementation and regulations that promote private sector development. Rwanda improved by 53.2%, from 7.4% in 1996 to 60.6% in 2015. These significant improvements in institutional quality for regulatory quality in Rwanda and Mauritius were as a result of specific institutional restructuring and reforms implemented in both countries. Egypt, Eritrea, Madagascar, Seychelles, Uganda and Zimbabwe have experienced disturbing deterioration in the institutional indicator for regulatory quality, with the following margins: 28%, 12.3%, 15.6%, 11.8%, 11.6% and 14.8% respectively.

The Worldwide Governance Indicators show that Mauritius, Seychelles and Rwanda are the region's top performers in rule of law holding percentile ranks of 77.4%, 62% and 60.1% respectively. Rwanda improved drastically in the percentile ranking between 1996 and 2015, gaining 57.7 points, from 2.4% in 1996 to 60.1% in 2015.Kenya, Ethiopia, Zambia, Swaziland and Uganda are the other countries that have made remarkable strides in improving the quality of contract enforcement, police, courts, as well as building confidence in the society. Countries like DR Congo, Eritrea, Libya, Sudan and Zimbabwe with percentile ranks below 10% need to implement institutional reforms in the police and courts to improve on contract enforcement mechanisms. This will build confidence in the agents and they will abide by the societal rules.

The percentile rank for corruption in table 1, illustrates that only Rwanda and Zambia have been fighting the institutionalised corruption for a 19-year period. Rwanda and Zambia have made significant strides in the fight against corruption as indicated by

aggregate governance indicators between 1996 and 2015 (see Table 1). The percentile corruption rank for Rwanda has increased by 55%, from 20% in 1996 to 75% by 2015. Zambia improved from 15.1% in 1996 to 43.3% in 2015. Other countries registered positive change in the percentile rank for corruption control are Burundi and DR Congo. However, some countries in the region have experienced significant decline in the institutional indicator for corruption control index. Eritrea is the worst affected country with 65.5% decline, followed by Madagascar (39.9%), Zimbabwe (37.1%), Malawi (26.2%), Egypt (21.5%) and Swaziland (12.4%). Countries that recorded marginal declines include Djibouti, Libya and Kenya with 2.4%, 1.9% and 1.6 decline respectively. Countries in the COMESA region need to take reformative steps that strengthen the existing institutional capabilities to ensure reduction in red tape and streamlining of administrative and bureaucratic procedures, investing and prosecuting corruption cases at all levels.

Table 1: Institutional Quality Indicators (Percentile rank) for selected COMESA Member states (1996 -2015)

	Political Stability			Voice and Account-ability			Government Effec-tiveness			Regulatory Quality			Rule of Law			Control for corruption		
	1996	2015	D. of	1996	2015	D. of	1996	2015	D. of	1996	2015	D. of	1996	2015	D. of	1996	2015	D. of
Burundi	2.90	6.70	3.8	3.80	13.8	10	2.90	12.0	9.1	4.40	27.4	23	2.90	11.5	8.6	4.90	10.1	5.2
Comoros	57.0	40.5	16.5	31.3	37.4	6.1	2.90	5.80	2.9	13.7	13.0	0.7	15.8	20.2	4.4	20	30.8	10.8
DR Congo	0	3.80	3.8	4.30	12.8	8.5	3.40	3.80	0.4	2.90	6.30	3.4	1.40	3.40	2	0	9.10	9.1
Djibouti	39.9	31.0	8.9	21.6	9.40	12.2	17.1	16.3	0.8	19.1	28.4	9.3	19.1	18.3	0.8	36.1	33.7	2.4
Egypt	26.6	8.60	18	24.0	18.2	5.8	47.8	22.1	25.7	52.5	24.5	28	53.6	35.6	18	56.6	35.1	21.5
Eritrea	15.0	18.1	3.1	13.0	0.98	12	11.2	4.80	6.4	13.7	1.40	12.3	38.8	4.80	34	70.2	5.30	65.9
Ethiopia	15.9	8.10	7.8	14.9	14.3	0.6	6.30	28.8	22.5	8.80	14.4	5.6	21.1	38.5	17.4	8.80	42.8	34
Kenya	21.7	9.0	12.7	28.4	41.9	13.5	43.4	43.8	0.4	36.3	43.3	7.0	16.3	36.5	20.2	15.1	13.5	1.6
Libya	17.4	3.33	14.1	9.13	9.85	0.72	19.0	1.92	17.1	3.43	0.48	2.95	15.3	1.92	13.3	25.9	24.0	1.9
Madagas-car	48.3	32.9	15.4	43.3	34.5	8.8	31.2	8.65	22.6	17.2	26.0	8.8	33.0	28.8	4.2	63.9	24.0	39.9
Malawi	27.5	45.2	17.7	43.3	48.3	5.0	33.7	26.4	7.3	38.7	23.1	15.6	35.4	44.2	8.8	49.3	23.1	26.2
Mauritius	84.1	79.5	4.6	73.1	72.4	0.7	63.4	80.8	17.4	50.5	82.2	29.7	78.5	77.4	1.1	73.2	67.8	5.4
Rwanda	3.90	44.2	40.2	6.25	17.2	10.9	11.2	51.4	40.2	7.40	60.6	53.2	2.40	60.1	57.7	20.0	75.0	55
S e y - chelles	81.6	68.1	13.5	57.2	49.8	8.4	75.6	68.6	7.0	62.3	50.5	11.8	69.4	62.0	7.4	82.4	77.9	4.5
Sudan	1.93	4.29	2.36	2.40	3.45	1.05	12.2	6.25	5.95	8.33	4.81	3.52	4.78	8.17	3.4	5.37	2.40	2.97
S w a z i - land	36.2	29.5	6.7	13.5	11.3	2.2	27.8	34.1	6.3	42.2	33.2	9.0	32.1	46.6	14.5	60.5	48.1	12.4
Uganda	7.73	20.0	12.3	19.7	29.1	9.4	24.4	37.0	12.6	57.8	46.2	11.6	30.1	43.3	13.2	28.8	12.0	16.8
Zambia	39.6	51.4	11.8	36.5	44.8	8.3	13.7	33.2	19.5	33.8	37.9	4.1	29.7	47.1	17.4	15.1	43.3	28.2
Z i m b a - bwe	28.0	25.7	2.3	30.8	15.3	15.5	47.3	11.5	35.8	18.6	3.84	14.8	25.4	6.25	19.2	44.3	7.20	37.1

Source: World Governance Indicators, World Bank (2017). D. of change refers to direction of change

Note: The percentile rank indicates the country's rank among all countries covered by the aggregate indicator, with 0 corresponding to lowest rank and 100 to the highest rank.

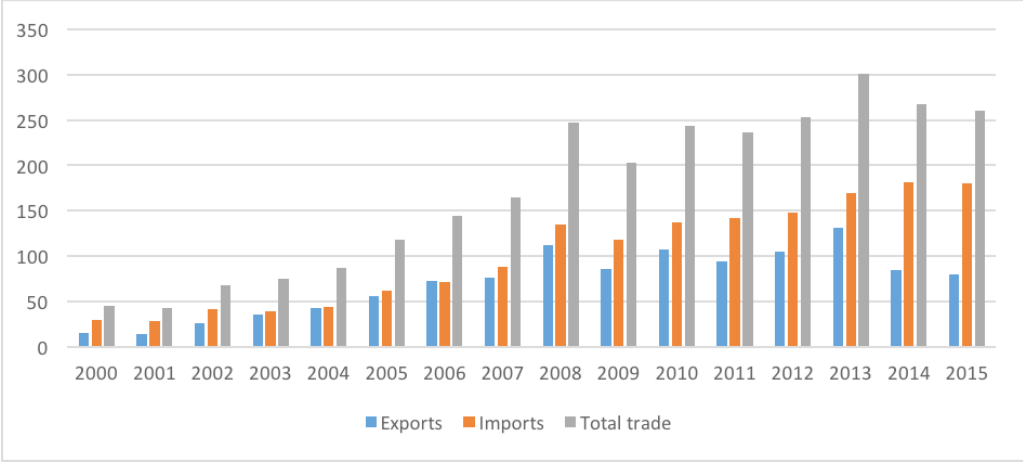
The major inference made from the above analysis is that institutional quality indicators in most COMESA countries are rather lower than the average, median of 50. Therefore there is urgent need to enhance and strengthen the institutional quality in COMESA countries within the region's framework. This is important for economic activities including trade as strong institutional quality will help reduce the effects of adverse selection, non-adherence to procedures and transaction costs and time.

The institutional framework is relevant in explaining the size of transaction costs and time that include: days to import and export, registration costs, real estate agent fees, legal fees and sales and transfer taxes. Low institutional quality increases the transaction costs incurred during the exchange and hence reduce trade.

2.2 Trade structure and performance

Global trade for COMESA member states (global-COMESA trade) grew from US$44.5 billion in 2000 to US$301.1 billion in 2013 before it plunge to US$259.9 billion in 2015. Specifically, total exports have declined from approximately US$131.6 billion by the end of 2013 to US$79.3 billion in 2015. Imports registered decline from US$182 billion by the end of 2014 to US$180.6 billion in 2015. Continuous decline in exports over the period 2013-2015 has worsened the trade deficit in the region, to approximately US$100.7 billion in 2015. Figure 1 below depicts global-COMESA trade performance from 2000 to 2015.

Figure 1: Global-COMESA Trade in US$ (Millions) 2000-2015



Source: Comstat, 2017

There was significant decline in the level of economic activities in the COMESA countries as evidenced by decreasing total exports. Of the 19 member states in the region, only Djibouti and Uganda registered positive growth in the levels of global exports in 2015 over 2014 levels. The worst affected member states were Democratic Republic of Congo (22.4%), Egypt (20.9%), Eritrea (28.3%), Libya (42.3%), Sudan (27.2) and Zambia (27.4%). On the import side, Comoros, Djibouti, Egypt, Eritrea, Ethiopia and Sudan registered negative growth in the levels of their global imports in 2015 over 2014 levels.

Regarding the major export markets for COMESA products, European Union (EU) is

ranked the top, with exports worth US$42.9 billion destined to the EU market in 2015. The other export markets ranked after the EU are China, COMESA, South Africa and Saudi Arabia, with exports worth US$11.2, US$9.6, US$4.5 and US$4.4 billion respectively. On the import side, China is ranked number one, with imports into COMESA worthUS$31.1 billion. The other major sources of imports are EU, India, South Africa and COMESA, with the following import values US$20.3, US$10.8, US$10.2 and US$9.7 respectively.

Table 2: COMESA's top 5 major export and import markets in 2015

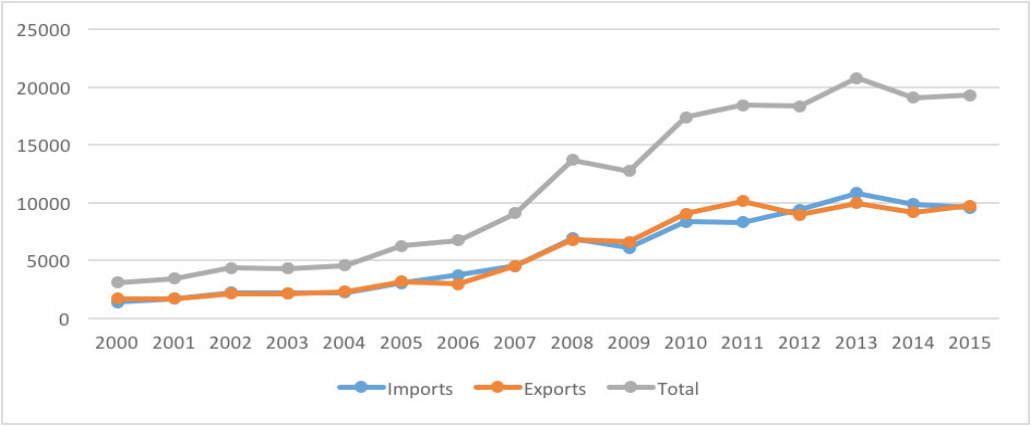
	Exports		Imports	
Rank	Market	US$ Million	Market	US$ Million
1	EU	42,918	China	31,139
2	China	11,154	EU	20,323
3	COMESA	9,561	India	10,838
4	South Africa	4,517	South Africa	10,168
5	Saudi Arabia	4,447	COMESA	9,738

Source: Comstat, 2017

2.2.1 Intra-COMESA trade performance

The establishment of Free Trade Area has in partly led to an increase in intra-COMESA trade from US$3.1 billion in 2000 to US$19.3 billion in 2015. Intra-COMESA exports increased from US$9.2 billion by the end of 2014 to US$9.7 billion in 2015, while imports declined from US$9.9 billion in 2014 to US$9.6 billion by the end of 2015. The increase in total intra-COMESA exports can partly be attributed to registered growths by key intra-trade players in the region, which are Egypt, Kenya, DR Congo, Sudan, Zambia and Uganda. Figure 2 below shows intra-COMESA trade trend over the period 2000-2015.

Figure 2: Intra-COMESA Merchandise Trade Performance (US$ Million) - 2000-2015



Source: COMSTAT, 2017

In 2015, Egypt, DR Congo and Kenya registered the largest shares of intra-COMESA export market with 18.6%, 18.2% and 15.4% respectively. Egypt exported goods worth US$1.8 billion, DR Congo US$1.7 billion and Kenya US$1.5 billion. The value of exports

for Sudan, Zambia and Uganda were US$1.4, US$0.98 and US$0.84 billion respectively.

Regarding intra-COMESA import share, DR Congo and Zambia recorded the largest market share of 21% and 20.9% respectively, with goods worth US$2.0 billion; followed by Sudan, Uganda, Libya, Egypt and followed with 8.5%, 7.3%, 7.1%, 6.5% and 6.4% respectively (Table 3).

Table 3: Intra-COMESA Merchandise Trade by country (US$ Million) – 2000-2015

Country	Exports				Imports			
	2000	**2005**	**2010**	**2015**	**2000**	**2005**	**2010**	**2015**
Burundi	5	16.1	24.6	48.0	19.0	53.9	105.9	77.3
Comoros	0.1	0.1	2.4	4.1	5.0	6.6	13.0	15.6
DRC	33.7	38.8	1134	1778	107.1	188.2	806.1	2004
Djibouti	4.1	62.8	601.7	15.5	73.4	84.0	78.1	150.6
Egypt	113.8	431.4	2344	1812	239.1	298.5	961.8	625.3
Eritrea	0.2	11.6	2.1	12.4	7.8	15.5	155.5	93.6
Ethiopia	155.1	100	287.3	162.1	107.6	192.1	286.2	297.1
Kenya	595.6	1331	1658	1501	77.3	175.7	504.1	613.8
Libya	50.4	115.7	334.8	90.5	69.3	166.3	1378	681.2
Madagascar	19.1	21.7	47.1	54.7	63.5	101.4	197.3	152.0
Malawi	41.5	45.0	215.6	210.1	52.8	177.6	231.8	226.5
Mauritius	96.8	108.9	155.7	225.7	58.3	72.8	125.3	171.3
Rwanda	35.1	41.0	82.7	331	28.7	141.0	415.2	395.2
Seychelles	2.4	0.8	2.5	1.5	12.5	21.0	47.0	84.6
Sudan	78.7	57.8	336.5	1402	201.2	477.1	767.9	815.5
Swaziland	65	64.9	140.2	176.4	0.5	1.1	10.7	21.0
Uganda	71.1	248.5	713.0	835.9	152.4	565.0	586.9	699.2
Zambia	152.1	336.5	690.2	975.5	85.3	246.4	1394	2003
Zimbabwe	170.7	176.0	267.0	101.4	57.7	61.3	271.2	434.6

Source: COMSTAT, 2017

A notable feature in the majority of COMESA countries is that balance of payments have remained in deficit for the entire period even though in some countries exports rose. Narrow range of export products and rising imports have been the main causes of widening trade gap among the COMESA member states.

3.0 Review of the Literature

The literature regarding institutions and trade (Sachs and Warner, 1995; Hall and Jones, 1999; Rodrik, 2002; Chong and Calderon, 2000; Rodrik et-al., 2002; Dollar and Kraay, 2003; Sekkat and Varoudakis, 2003; Achy and Sekkat, 2003 etc) has been paying more attention to the role that good institutions and trade openness play in explaining economic growth. The major conclusion drawn from the literature is that causality is bi-directional and running in all possible directions. On one hand, good institutions are a pre-requisite for long term growth and increased productivity. On the other hand, accelerated growth and trade openness increase the demand for good institutions. Studies on countries in other regions other than COMESA indicate that more open economies tend to adjust faster from primary to secondary exports (Sachs and Warner, 1995). The study by Sekkat and Moen (2004) found out that the deterioration of institutional quality in the Middle East and North Africa (MENA) region has caused low performance in manufactured exports and foreign direct investment.

The study of the relationship between institutions and trade has received little attention, which results in the relative scarcity of solid theoretical arguments connecting trade and institutions. Although the new institutional economics emphasises that institutions are fundamental to the effective functioning of the market-based economies (Williamson, 2000), studies investigating the relationship between institutions and trade are scarce. Some researchers have documented that institutional quality is key to the promotion of trade and is catalytic to the process of economic integration. Low corruption, effective contract enforcement mechanisms, sound regulation and maintaining of efficient public sector administration are cited as key institutional and governance factors that improve trade. Despite the fact that the role of institutions and governance are not formalised as part of trade theory, a growing body of empirically recognised relations between institutions and trade is receiving much attention and is significant to this study.

Using a simple model with paradoxical comparative statics, Anderson and Young (1999) provided a first theoretical illustration on the relationship between institutions and trade. They found that lack of contract enforcement may act as custom duties on risk-neutral traders and may impede trade as much as tariffs do.

The study by Anderson (2001) suggests that the ineffective institutions hinders international trade through increasing of both transaction costs and risks of trading internationally. Rodrik (2002) finds that the key impeding factor of international trade is the problem of contract enforcement. Studies by Ades and Di Tella (1999) and Wei (2000) identify corruption as another element that impede trade. The conclusion stemming from their studies is that high trade intensity is associated with lower corruption levels. In their study Anderson and Marcouiller (2002) confirmed that institutional variables are significant determinants of trade. In particular, the study provide empirical evidence that weak institutions act as significant barriers to trade.

Some studies concur that the quality of institutions has a direct positive and sensitive effect on trade, on the contrast Rodrik et-al., (2002) concluded that institutions may also indirectly affect trade through their impact on variables that explain trade such as investment and productivity. The study by Hall and Jones (1999) noted that ineffective institutions reduce aggregate productivity and growth. Olson et-al., (2000) found that lower productivity and growth impedes competitiveness in the international markets, which is likely increase difficulties in exporting and trading abroad. The study by Das (2010) posit that economic institutions have a more significant effect on development

than social and political institutions, therefore, it is possible for countries with better institutional quality to have an advantage to reap benefits from trade integration and geography. Other similar studies include: Derby et-al., (2010) on good public governance and foreign direct investments; Busse and Hefeker (2005) on the role of democratic rights, government stability and ensuring law and order as significant determinants of foreign direct investments, Barro (2001) on the relationship the rule of law and economic growth; and Li and Resnick (2003) on effects of democracy and property rights on foreign direct investment.

The literature on relationship between institutions and trade have neglected the "second best theory" that considers corruption as a way to by-pass restrictions imposed by governments. There is evidence in literature that corruption must be explained as a directly unproductive profit-seeking activity and can be compared to activities such as tariff evasion in the international trade (Bhagwati, 1992). Even though these theories does not explain the interaction between trade and corruption directly, they contemplate corruption as a lubricant that catalyses trade (Lavallée, 2005).

The overview of the literature shows that COMESA region has not been the part of the studies done on the relationship between trade and institutions, even though the region suffer deficiencies in institutional quality.

4.0 Methodology

The gravity model continues to be the workhorse in the international trade economics because to its consistent results and comparatively compact specification (Grant and Lambert, 2008). The gravity model has undergone rigorous theoretical and empirical improvements since its genesis by Tinbergen in 1962 (Bergstrand, 1985; Anderson and Wincoop, 2003). The major advantage of the gravity trade model is its ability to examine policy and institutional variables together with traditional determinants of bilateral trade flows. In addition, the direction of effect of policy and institutional quality variables, whether negative or positive, need not to be predetermined (Anders and Caswell, 2009; Li and Saghaian, 2014)).

The augmented gravity model can be specified as follows:

$$LnEXP_{ijt} = \beta_0 + \beta_1 LnGDP_{it} + \beta_2 LnGDP_{jt} + \beta_3 LnDIST_{ij} + \beta_4 LANG_{ij} + \beta_5 LnTP_{it} + \beta_6 GE_{it} + \beta_7 RQ_{it} + \beta_8 RL_{it} + \beta_9 CC_{it} + \varepsilon_{ijt} \quad (1)$$

Where, *EXP* is the export flows from country i to j; *GDP* is the per capita gross national income for country i and country j; *DIST* is the proxy for transaction costs and denotes the geographic distance between country i and j; *LANG* is the dummy for common language between i and j; *TP* is trade policy proxied by average tariffs in country i; *GE* is government effectiveness; *RQ* is regulatory quality; *RL* is rule of law; *CC* is corruption; i and j represent domestic and trading partner respectively; t is time period and ε is error term.

Equation 1 is the benchmark specification which controls for the overall impact of trade policy and institutional quality on trade flows. However, Anderson and Wincoop (2003) and Baier and Bergstrand (2007) argue that the gravity model suffer omitted variables and policy endogeneity problems which come from unobserved heterogeneity between countries. To correct for this, this special effect can be treated as either random variable or fixed effect. To choose the appropriate model between random effects and fixed effects model, we conducted the Hausman specification tests and the null hypothesis

could not be rejected. Therefore the Random Effects Model (REM) was preferred to fixed effects model.

The random effects model used in this study was specified as follows:

$$LnEXP_{ijt} = \beta_0 + \beta_1 LnGDP_{it} + \beta_2 LnGDP_{jt} + \beta_3 LnDIST_{ij} + \beta_4 LnLANG_{ij} + \beta_5 LnTP_{it} + \beta_6 LnGE_{it} + \beta_7 LnRQ_{it} + \beta_8 LnRL_{it} + \beta_9 LnCC_{it} + \omega_i + \varepsilon_{ijt} \quad (2)$$

Where W_i is the country-specific effects that are uncorrelated with the independent variables.

4.1 Data type and sources

The panel data used in this analysis include exports of 19 COMESA member states (Burundi, Comoros, Djibouti, DR Congo, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe) for the period 2000 to 2015 as the dependent variable. The variables that were used as trade control variables are per capita GDP (PGDP) for both domestic and partner countries and trade policy. Four institutional quality measures were chosen, which are government effectiveness, regulatory quality, rule of law and control for corruption.

We included the per capita GDP (PGDP) for both domestic and partner countries as control variables because improvements and expansion of trade is influenced by highly performing economy which is suitable for investment, production and sales (Frankel and Romer, 1999). Trade policy (TP) was included because it determines the degree of a country's inward or outward orientation (Yanikkaya, 2003). The data for average tariffs level which was used as a proxy for trade policy was obtained from World Trade Integrated Solution (WITS) (2017).

The standard gravity variables such as distance (DIS) and common language (LANG) were included in the model to capture the effect of distance and similarity in tastes. The data for geographical distance and official common language is obtained from centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

On institutional quality variables, the paper used the most modern and all-inclusive data set on quality of governance available. The database was conducted for the World Bank by Kaufmann et-al. (2002). The four indicators used in this paper are discussed below: corruption, government effectiveness, regulatory quality and rule of law. Government effectiveness (GE) captures the perceptions of the quality of public services, quality of civil service and the degree of independence from political pressures, quality of policy formulation and implementation, and credibility of the government's commitment to such policies. Regulatory quality (RQ) to capture the perceptions of state's to formulate policies and implement sound polices and regulations that permit and promote private sector development. Rule of law (RL) was also included to capture the extent to which citizens have confidence in and abide by the rules of the society, in particular quality of contract enforcement mechanisms, property rights, the police, and courts as well as the likelihood of crime and violence. Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption.

5.0 Estimation Results and Discussion

The section focuses on estimation of the model as guided by the methodology in the previous section and presentation and discussion of final results. Section 5.1 presents the stationarity and model specification tests. The subsequent section presents and discusses the regression model results.

5.1 Diagnostics tests

Table 4 presents the results of the gravity model specification of the determinants of COMESA export flows over the 2000-2015 period, estimated by pooled OLS estimator and random effects estimator. The Hausman specification test (table 4) failed to reject the null hypothesis of no misspecification or exogeneity of any of the regressors, hence, the random effects estimator is preferred to pooled OLS estimator and fixed effects model. The importance of the time effects, which control for common shocks affecting all COMESA countries, shows that their inclusion is justified. Therefore, estimation and interpretation of the results was based on the random effects model.

Table 4: Hausman specification test results

Test summary	Chi-square statistic	Chi-square d.f	Probability
Cross-section random	0.0000	7	1.000

Source: Authors' estimates from Eviews 9

Moreover, stationarity tests were conducted using LLC and IPS unit root tests. The results (table 5) display that all variables used in the model are stationary. This implies that at least one individual series does not embrace a unit root. Stationarity means that it is not necessary to perform panel cointegration tests.

Table 5: Stationarity results

Series	LLC Test	IPS test	Result
EXP	-5.66960(0.0000)***	-2.68100(0.0037)***	Stationary
GDPX	-9.52130(0.0000)***	-6.22295(0.0000)***	Stationary
GDPM	-6.46470(0.0000)***	-1.9943(0.0231)**	Stationary
TEC	-4.82885(0.0000)***	-2.68140(0.0037)***	Stationary
TP	-20.3295(0.0000)***	-10.2833(0.0000)***	Stationary

Source: Authors' estimates from EViews

5.1 Discussion of results

Regarding the GDP-related parameter estimates, the positive and significant coefficient values of overall economic size for both exporter and importer countries support the gravity theory. The findings reflect that any increase in the per capita income in domestic economy as well as in its trading partners translate into increase in export capacity in COMESA countries at both regional and global level as shown in Table 6. The trade-impeding effect of transport costs and trade-related costs is apparent from negative coefficient of distance. Similarities in tastes and cultural ties, proxied by common language, are not important in explaining bilateral trade flows.

Table 6: Gravity model estimated results for Random Effects Model

Variables	Intra-COMESA	Extra-COMESA
GDP Exporter	0.1898* (3.3205)	0.7482***(6.3633)
GDP Importer	1.3108*** (5.9477)	0.4557** (2.3205)
Distance	-3.0399***(-5.5498)	-1.2228*** (-4.883)
Common Language	-0.7754*** (9.3071)	0.0682 (0.1750)
Trade Policy	-0.2897*** (-1.0213)	-0.1293*** (-4.4556)
Corruption	-0.33631*** (-1.4662)	-0.4786*** (-3.1407)
Government Effectiveness	0.3192** (1.1504)	0.2109* (1.2135)
Regulatory Quality	0.6334** (2.4040)	0.5102**(2.4955)
Rule of Law	-0.1811(-0.6519)	-0.2156 (-0.8873)
Constant	12.822*** (3.5205)	4.9560**(2.0782)

Source: Authors' estimates from Eviews 9. *, **, *** indicate significance at 10%, 5% and 1%, respectively. Numbers in the parenthesis are asymptotic *t*-statistics.

The results show that trade policy is a major factor in explaining both intra-COMESA and extra-COMESA trade flows. The result of the trade policy variable confirm that gradual trade liberalisation through tariff reduction facilitates trade. This also mean that living with the World Trade Organisation (WTO) principles of trade liberalisation and becoming more outward oriented stimulates the export capacity in the COMESA region.

The institutional quality indicator for government effectiveness (GE), has the expected positive and statistically significant coefficient at both intra-COMESA and extra-COMESA trade flows. In particular, a 1% increase in government effectiveness would lead to an expansion in intra-COMESA trade by 0.21% and extra-COMESA trade by 0.32% The results concur the findings by Francois and Manchin (2006). This finding corroborates the widespread belief that poor government ineffectiveness.

The rule of law variable has a negative and statistically insignificant coefficient at both intra-COMESA and extra-COMESA trade levels.

The coefficient of regulatory quality explain a positive and significant in influencing export flows for COMESA countries, at both regional and international levels. A 1% increase in regulatory quality will increase both intra-COMESA and extra-COMESA exports by 0.63% and 0.51%, respectively. The result support the view that government's ability to formulate sound policies and regulations that permit and promote private sector development open up new opportunities for COMESA member states to expand export capacity through increased competitiveness. The results is also supported by De Groot et-al. (2004), Anderson and Young, 1999; Bigstein et-al., 2000; Gilbert, 2000 and Anderson and Marcouiller, 2002.

The results on corruption variable has the negative and statistically significant coefficient showing that the higher degree of corruption the lower the trade volumes. A 1% increase in corruption levels will depress intra-COMESA and extra-COMESA export flows by 0.34% and 0.48%, respectively. The result confirms the view that high trade intensity is associated with lower corruption levels and high corruption impedes trade. This result is supported by Hall and Jones (1999).

6.0 Conclusion and Policy implications

This section contains a conclusion to the study. It presents the conclusions drawn from the results of the previous section. This will be followed by policy implications.

6.1 Conclusion

The study analysed the effects institutional quality on trade in COMESA. Our results of the random effects model controlled for endogeneity provide evidence that presence of corruption significantly reduces both regional and global exports; improvements in government effectiveness is weakly associated with increased regional and global exports; improved regulatory environment facilitates increased levels of exports at both regional and global level, deterioration in the rule of law seems to be working against improved exports of the COMESA countries; abiding by the principles of WTO (reduction in tariffs) and becoming more outward oriented stimulates regional and global exports.

Our results support the view that institutions do really matter and are an integral part of enhancing trade for a country. The results suggests that institutional quality is a pre-requisite for successful trade liberalisation policies. In addition the results encourage the efforts to increase the quality of institutions which may help COMESA region and other developing countries to improve their export capacities.

6.2 Policy implications

The findings of this study have the following policy implications. First, improved quality of institutions mean reduction in transaction costs and other cost of doing business, thus lowering production costs while improving competitiveness. Therefore, COMESA member states need to focus on the improvement in quality of institutions, particularly those that facilitate trade. In addition, should undertake capacity building and training on effects on institutional quality on trade for easy understanding by policy-makers is worth considering.

Secondly, the implication of the regression results is that improvement in competence of and efficiency of the civil service in carrying out government's day to day duties will improve exports by significant margins. The other implications are that countries with lower levels of government intervention in the economy and lower corruption levels have higher chances of boosting exports than otherwise. Accordingly, COMESA member states need to undertake institutional reforms to improve institutional quality so as to stimulate economic growth and trade. Institutional reforms should result in better governance and thus leading to a more sustainable growth of economic activities, including trade. For that reason, reforms of the institutions in respective countries in the region should be a highly important topic on the agenda to attract foreign direct investment and increase trade.

There is an increasing understanding from this research evidence that institutional factors are a missing link to harness gains from trade. Therefore, it is essential that the region's members become conscious of the comparative advantage that come with the development of better institutions, which reduces the opportunity cost and have a positive impact on trade performance.

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TELECOMMUNICATION, INTRA-TRADE AND ECONOMIC GROWTH WITHIN THE COMMON MARKET FOR EASTERN AND SOUTHERN AFRICA REGION

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Nelson H. Were Wawire

Abstract

This study investigated the causal relationship between telecommunication, intra-trade and economic growth a panel data for COMESA countries. The study used the pooled mean group estimation (PMGE) method and an augmented gravity model and established a unidirectional causality from telecommunication to trade and from trade to economic growth exists within COMESA region. The study further found that telecommunication, GDP for both COMESA as a bloc and trading partners, as well as common language between trading partners affected trade positively. Further, the study found that the effect of telecommunication on economic growth and trade was positive and significant. Based on the findings, COMESA Member States should focus on implementing strategies that enhance telecommunication infrastructure among Member States such as reducing roaming call cost, increasing network coverage, promoting use of mobile cellular and digital literacy.

1.0 Introduction

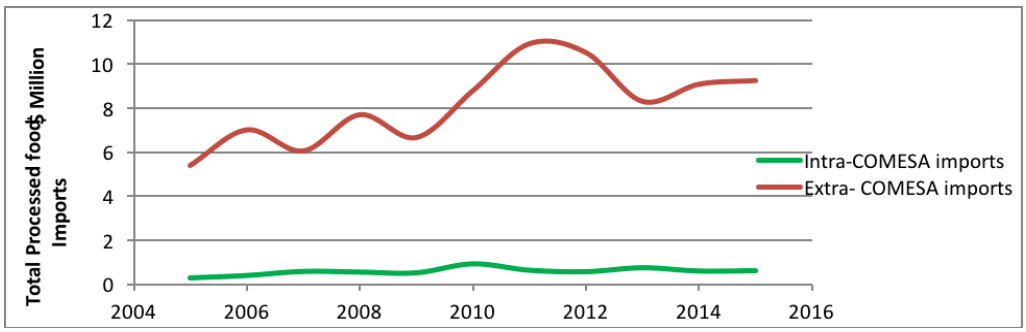
The economic growth of COMESA Member States has been attributed to growth in the agriculture, manufacturing, mining, exports, and Foreign Direct Investment (FDI), (Karamuriro, 2015). The growth in the various sectors of the economy in COMESA region is determined by various factors among them good economic infrastructure. According to Article 84 of COMESA Treaty, it is vital that Member States develop transport and communication policies that aim at improving and expanding existing links as well as creating new ones as a means of furthering physical cohesion in the region (COMESA, 2013). One of the major goals of COMESA is to boost regional integration by promoting effective and efficient ICT enabling environment which is meant to reduce the cost of doing business, stimulate economic growth and alleviate poverty among the member states.

0.1 Telecommunication Infrastructure in COMESA

Telecommunication infrastructure may be broadly divided into two; the fixed line telephony and mobile telephony. According to International Telecommunication Union (ITU) (2007), there were approximately 1,270 million fixed line telephones worldwide, of which Africa as a continent had less than 2 percent. COMESA like the rest of the world has undergone dramatic reforms in the telecommunication sector since 1970's. All COMESA member states except Egypt had zero mobile cellular and fixed line subscriptions per 100 people by 1992 (World Bank, 2016). In 1987, Egypt had 2,627 mobile cellular subscriptions which represented 0.005 mobile cellular subscriptions per 100 people. However, to facilitate communication, countries had a number of fixed line telephone subscriptions which were under government monopolies.

After 1992, most of COMESA Member States recorded a growth in mobile cellular subscription except Comoros and Eritrea whose first subscriptions were recorded in 2003 and 2004 respectively. The growth rate of the mobile cellular subscribers and fixed line telephone in COMESA region is shown in Figure 1.1.

Figure 1.1. Mobile and Fixed Lines Telephones in COMESA Region



Source: Computed based on the COMSTAT, 2015

1.2 Role of Telecommunication in Intra-Trade and Economic Growth in COMESA Region.

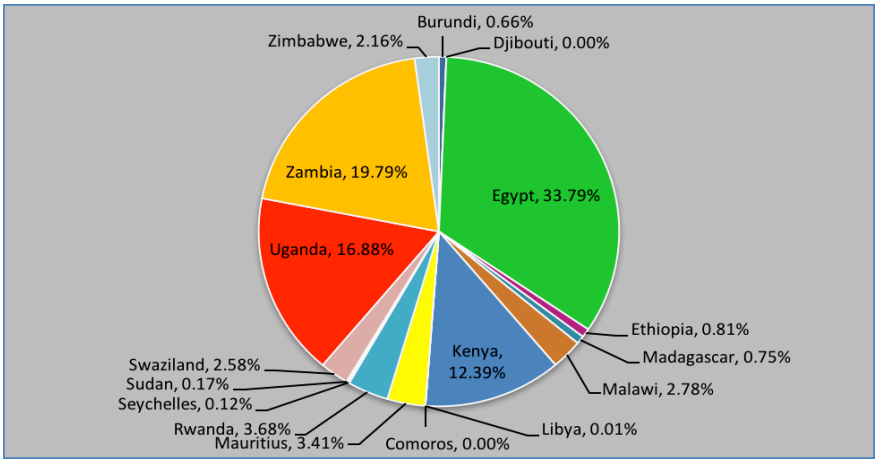
Telecommunication infrastructure leads to growth in intra-regional trade as well as economic growth. In COMESA mobile telephony has grown tremendously surpassing fixed lines telephone (ITU, 2006). Mobile telephones have transformed ways in which consumers and producers interact and conduct business.

Information dissemination is one of the most important uses of mobile telephone in intra-regional trade. Mobile networks have played a key role in trade through reducing information asymmetry. With the use of mobile phones, producers and consumers are able to access information with reduced search costs. According to Roller and Waverman (2001), improvement in the communication system, helps reduce the transaction cost which in turn increases the firm's production in various sectors of the economy. The introduction of mobile phones has enabled traders to market their products and communicate with their customers effectively without necessarily having physical visits. Mobile phones have also played a critical role in payment of goods and services. The growth of the mobile banking services as well as other mobile money services, for instance M-Pesa, in Kenya has eased transactions between traders' and consumers. Thus, the use of mobile phones has played a key role in enhancing efficiency and competitiveness among business owners (Lei & Kingsley, 2006).

Telecommunication remains core for development in COMESA bloc. As the sector develops, it creates job opportunities and attracts FDI. Telecommunication, therefore, is an important infrastructural component that facilitates the growth of other sectors of an economy such as manufacturing, education, health among others. It is essential in daily activity that promotes economic growth.

It is evident from Figure 1.3 that the mobile phone subscribers have been increasing at an increasing rate within COMESA as the fixed telephone lines per 100 inhabitants decline. This could be attributed to the many advantages and uses that mobile phones have as compared to fixed telephone lines.

Figure 1.3 Telecom, Intra-COMESA Trade and Economic Growth



Source: Computed based on the COMSTAT, 2015

The total trade in COMESA had been increasing up to 2008 and thereafter started declining while economic growth has been fairly constant since 2010. On the contrary, the mobile cellular subscription has been increasing.

1.4 Statement of the problem

COMESA aims at boosting regional integration through effective and efficient ICT enabling environment in order to reduce transaction cost. To achieve this objective, COMTEL identified five projects with an estimated cost of $ 635 million during the COMESA Infrastructure Investment Conference (COMESA, 2013). The projects included, IP clearing house and Regional IP Peering points and COMTEL Traffic clearing house, Billing Platform and SAP Financial System for all Member States. The projects were aimed at facilitating efficient interconnectivity that would promote integration of trade activities in the region. Based on this, COMESA has dedicated vast resources on telecommunication with an intention of stimulating trade and economic development among Member States. However, it is important to determine empirically whether investment in telecommunication infrastructure truly leads to growth in intra-COMESA trade and economic growth or vice versa. This is as a result of the inconsistent trend between telecommunication and intra-COMESA trade as well as economic growth for

COMESA region as shown in figure 1.3.

This study, therefore, aims to analyze the effects of telecommunication on trade and economic growth in COMESA region, taking cognizance of the fact that telecommunication comprises of mobile telephony and fixed line telephony. The study will seek to establish both the direction of causality between the variables and the magnitude of the effect. It is imperative to conduct the study so as to determine the effects of the continued increase in telecommunication infrastructure investment on intra-trade and economic growth and its justification in COMESA region. The investment comes at great expense to COMESA bloc and the governments of Member States.

1.5 Objectives of the study

The general objective of this study is to analyze the effect of telecommunication infrastructure on intra-trade and economic growth in COMESA region. The specific objectives are:

i. To establish the causal relationship between telecommunication, trade and economic growth in COMESA region.

ii. To estimate the magnitude in which telecommunication infrastructure affect trade and economic growth in COMESA region.

1.6 Research questions

i. What is the causal relationship between telecommunication, trade and economic growth?

ii. What is the magnitude at which telecommunication affect trade and economic growth?

2.0 Review of the Literature

2.1 Theoretical literature

Endogenous growth model

The theoretical analysis of the impact of telecommunication on growth is founded in the growth theory. Specifically, the endogenous growth theory plays a vital role in internalizing effects of telecommunication infrastructure on economic growth. This study adopts the Neo-Classical theory, developed by Solow and Swan (1956), which is elaborated by the endogenous growth theory. The theory explains the determinants of economic growth.

According to Romer (2006), the model is based on four variables that gives the production function expressed as; $Y(t)=F(K(t), A(t)L(t))$ (1)

Where Y is output, K is capital, L is labour, and A is knowledge or the effectiveness of labour, *t* represents time.

The model follows the main assumptions of a production function, for instance; constant returns to scale, decreasing marginal returns of capital and labour, savings as a fixed fraction of output etc (Wainaina Obere and Wawire, 2014; Mankiw, 2010; and Mallick, 2002).

In order to take into account telecommunication infrastructure, the study adopted Wainaina, Obere and Wawire (2014) framework. The "extended" Neo-Classical model holds that the output (Y) is a function of private physical capital (Kp) and public infrastructure services, consisting of spending on roads, power plants and telecommunication infrastructure among others. Therefore, the study extends the neo-classical model by introducing telecommunication infrastructure as one of the growth variables. This has been supported by Levine and Renelt (1992), Waverman, Meschi and Fuss (2005) among others.

2.2 Empirical Literature

The empirical studies were classified into three; the effect of telecommunication on trade, telecommunication on economic growth and telecommunication on trade and economic growth.

2.2.1 Telecommunication and Economic Growth

Wilson *et al.* (2014) conducted a study on how telecommunication development aids economic growth using Granger causality test and Ordinary Least Squares (OLS) for top five African countries. They found that there was no causal relation between mobile and fixed teledensity and economic growth. However, economic growth was influenced by the developments in the telecommunication sector in Africa.

Wainaina *et al.* (2014) applying Generalized Method of Moment (GMM) method of estimation, used panel data from 44 Sub-Saharan African countries to analyze the relationship between mobile teledensity and economic growth. The study found that there was a bi-directional causality for mobile teledensity and economic growth.

Roller and Waverman (1996) used a structural model that endogenizes the telecommunication investment using data from Summer and Heston (1991) database to estimate the effect of investment in telecommunication on economic growth for 21

OECD and 14 non-OECD countries. They found that the effect of telecommunication investments on economic growth was greater in OECD countries as compared to that of non-OECD countries.

The study by Waverman, Meschi and Fuss (2005) on the impact of mobile telephony in developed and developing economies indicates that economic growth was significantly influenced by mobile telephony in developing countries as compared to the developed countries.

2.2.2 Telecommunication and Trade

Analyzing the effect of mobile telecommunication on trade between European Union (EU) and Africa, Holmgren (2012) used gravity model for the period 2000 to 2009. The results indicated that a one percent increase in mobile telecommunication resulted to a 0.25 percent increase in export flows from EU to Africa.

Thiemann, Fleming and Mueller (2012) applied the gravity model to estimate the impact of ICT on international trade. They found that mobile phone penetration positively influenced trade in fruits and vegetable exports while the use of fixed telephone lines led to a decrease in banana imports.

Hashim and Khair-Uz-Zaman (2010) applied OLS to study the effect of investment in telecommunication on trade in Pakistan. Their results indicated that investment in telecommunication positively influenced trade.

2.2.3 Telecommunication, Trade and Economic Growth.

Ismail and Mahyideen (2015) using the augmented gravity model estimated the effect of infrastructure on trade and economic growth in selected economies in Asia. They concluded that telephone lines and internet security had a positive and significant effect on bilateral trade. Further they investigated the impact of infrastructure on economic grow using pooled mean group estimation (PMGE) and found that the quantity as well as quality of infrastructure enhanced economic growth. However, high quality infrastructure was found to be more beneficial in influencing economic growth.

Bankole, Osei-Bryson, and Brown, (2015) conducted a study that explores the impacts of telecommunications infrastructure and IQ on trade efficiency in Africa, using archival data from 28 African countries. The authors employed partial least squares analysis, data envelopment analysis and regression splines to analyze data. Their results suggested that IQ coupled with telecommunication infrastructure enhance efficiencies in intra-African trade flow.

3.0 METHODOLOGY

3.1 Theoretical model

This study applied the extended neoclassical growth model to analyse the effect of telecommunication on economic growth.

Adopting the Solow (1956) growth model, the production function is expressed as;

$$Y(t)=(K(t), A(t)L(t)) \quad (2)$$

From equation 2, capital (K), labour (L) and effectiveness of labour (AL) can be combined at any given time (t) to produce output (Y).

Following Romer (2006) neo-classical growth model, the study's empirical methodology aims at examining the determinants of changes in output. Therefore, the production function expressed in equation 2 is assumed to encompass labour-augmenting technological progress and that the technology term $T(t)$, grows at constant rate x. Therefore, the change in capital stock is expressed as;

$$\dot{K} = s.F\big(K, L.T(t)\big) - \sigma K \quad (3)$$

From equation 3, per capita growth rate is given as follows;

$$\frac{\dot{k}}{k} = s.\frac{F\big(k,T(t)\big)}{k} - (\sigma + n) \quad (4)$$

Assuming constant returns to scale, average product of capital is constant if and only if *k* and $T(t)$ grow at the same rate. Therefore, the output per capita is expressed as;

$$y = k.F\left(1, \frac{T(t)}{k}\right) = F(k, T(t)) \quad (5)$$

Where the quantity of capital per effective labour is given by *k* while y represents the output per unit of effective labour.

The technology incorporated is assumed to be as a result of investment in telecommunication infrastructure. From equation 5, the growth in output is attributed to the effective amount of labour. Therefore, the study applies equation 5 to establish the effect of telecommunication infrastructure on economic growth in COMESA. In regard to this, it is assumed that investment in telecommunication infrastructure contribute to the efficiency in labour.

3.2 Panel data tests

3.2.1 Panel Unit root test

Prior to the pooled mean group estimation analysis, it was important to test whether the variables are non-stationary or not. The unit root test on panel data was necessary to avoid spurious regression which may yield misleading estimates. The test also helped to determine the order of integration of the variables. The study adopted the Im-Pesaran-Shin (IPS) panel unit root test (Im, Pesaran, and Shin, 2003). The IPS test was chosen as it is superior to Augmented Dickey Fuller (ADF) test and other unit root test techniques in analyzing long-run relationships in panel data with fewer time observations. The null hypothesis for the test is that all panels contain unit roots against alternative that at least one panel is stationary.

3.2.2 Specification test

It was important to test for homogeneity when using panel data in order to determine whether the model specification is heterogeneous or homogenous. This study applied the F-test to test for unobserved country effects in the Fixed Effects (FE) model and Lagrange Multiplier (LM) test for Random Effects (RE) model. For the F-test, if the F-statistic is statistically insignificant, no panel models need to be specified, as all individuals are sufficiently homogeneous. For the LM test, the null hypothesis is that variances across units are zero, that is, no panel effect. If the chi square is statistically significant, the null hypothesis is rejected hence, the RE model is appropriate.

3.2.3 Hausman Test

After confirming the presence of unobserved country effects (or unobserved heterogeneity), the Hausman test was conducted to choose between the fixed effects (FE) method and the random effects (RE) method of estimation.

H_0 = Individual effects were not correlated with the regressors

H_1 = Individual effects were correlated with the regressors.

Under the null hypothesis, the theoretical model was specified with individual RE while under the alternative hypothesis; the model was specified with individual FE. If the null hypothesis was not rejected, the RE model was favoured over its FE counterpart and vice versa (Hausman and Taylor, 1978).

3.3 Causality analysis.

The first objective of this paper was to establish the causal relationship between telecommunication, trade and economic growth in COMESA region. According to Kaur and Malhotra (2014), the causality test is important as it specifies the direction of relationship between two or more variables. Chen, Clarke and Roy (2004) specified a general theoretic model of finite order panel autoregression of order p as follows;

$$Z_{it} = \sum_{j=1}^{P} \theta_{ijt} Z_{i,t-j} + \mu_{it} + \varepsilon_{it} \qquad (6)$$

i=1,...N and *t* = 1,…T with K-dimension.

Thus, K = 2 for bivariate models and K = 3 for trivariate models. The country specific and period fixed effects are represented by the vector while the vector represents the error term which is assumed to be independently and identically distributed (IID) across countries and time.

From equation 6 above, this study adopts Sims (1989) framework to specify the dynamic panel data model for establishing the causal relationship between telecommunication, trade and economic growth as follows;

$$GDP_{it} = \alpha_1 + \sum_{m=1}^{M} a_m TEL_{i,t-m} + \sum_{m=1}^{M} b_m TRD_{i,t-m} + \sum_{m=1}^{M} c_m GDP_{i,t-m} + \mu_i + \gamma_{it} \quad (7)$$

$$TEL_{it} = \alpha_2 + \sum_{n=1}^{N} d_n GDP_{i,t-n} + \sum_{n=1}^{N} e_n TRD_{i,t-n} + \sum_{n=1}^{N} f_n TEL_{i,t-n} + \acute{\omega}_i + \varepsilon_{it} \quad (8)$$

$$TRD_{it} = \alpha_3 + \sum_{k=1}^{K} g_k TEL_{i,t-k} + \sum_{k=1}^{K} h_k GDP_{i,t-k} + \sum_{k=1}^{K} l_k TRD_{i,t-k} + \pi_i + \sigma_{it} \quad (9)$$

Where;

GDP, TEL and TRD refer to logs of gross domestic product, telecommunication and trade respectively. *k*, *m* and *n* show the levels of lags for trade, GDP, telecommunication respectively. *i* indicates the countries in the sample while *t* represents the time periods. The unobserved country-specific effects are represented by, μ, $\acute{\omega}$ and π, while the error terms are given by γ_{it}, ε_{it} and σ_{it}.

The null hypotheses that were tested from equation 7 to 9 are;

(i) GDP does not Granger-cause Telecommunication and trade,

(ii) Telecommunication does not Granger-cause GDP and trade and

(iii) Trade does not Granger-cause telecommunication and GDP, in equations 7, 8 and 9 respectively.

Following Isham (1995), the equations would be first differenced to remove the unobserved effects and apply the Granger causality test to determine the causal direction. Based on the works of Hausman and Taylor (1978), Granger causality test is chosen for this study because it provides more accurate estimates and results in detecting causal relationship.

3.4 Impact of telecommunication infrastructure on economic growth

To estimate the effect of telecommunication infrastructure on economic growth, the study employed the pooled mean group estimation method (Pesaran, Shin and Smith, 1999). This is because the PMGE method allows short-run and long-run coefficients, intercepts and error variances to vary across countries according to Pesaran *et al*. (1999).

Adopting Mahyideen, Ismail and Hook (2012) framework, an autoregressive distributed lag (ARDL) model for time t=1, 2,…T and countries i=1,2,…N is specified as follows;

$$g_{it} = \sum_{j=1}^{P} \lambda_{ij}\ g_{i,t-j} + \sum_{j=0}^{q} \boldsymbol{\partial}_{ij} \boldsymbol{h}_{i,t-j} + \mu_i + \varepsilon_{it} \qquad (11)$$

Where h_i (K×1) is a vector of explanatory variables for country *i* and g_{it} is the dependent variable. $\boldsymbol{\partial}_{ij}$ (K×1) represents coefficient vectors; μ_i gives the fixed effects while λ_{ij} are scalar coefficients. The error term $(\varepsilon_{it})$is assumed to be identically and independently distributed across *i* and *t* with a mean of zero and variance $\sigma_i^2 > 0$

For convenience, equation 11 is re-parameterised as follows;

$$\Delta g_{it} = \emptyset_i\, g_{i,t-1} + \beta_i' h_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{ij}\, \Delta g_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}' \Delta h_{t-j} + \mu_i + \varepsilon_{ij} \qquad (12)$$

To capture the effect of telecommunication infrastructure on economic growth, the study adopted the extended growth equation model developed by Mahyideen, Ismail and Hook (2012). The model takes the general form of:

$$y_{it} = \alpha + \delta Y_{i,t-1} + \beta \boldsymbol{X}_{it} + \mu_{it} \qquad (13)$$

Where α and δ are scalars, β is a K×1 and $\boldsymbol{X}it'$ is the i^{th} observation on K explanatory variables. It contains a set of control variables meant to account for production factors. The control variables chosen for the study follows growth theory and is consistent with the literature review on the determinants of economic growth in COMESA region. Based on data availability for COMESA bloc, this paper chose the following control variables for analysis: population growth (POP), trade (TRD), foreign direct investment (FDI), gross capital formation (k) mobile cellular subscription per 100 people (MTEL), fixed telephone subscription per 100 people (FTEL) and telecommunication (TEL) which is a combination of mobile teledensity and fixed line teledensity.

Therefore, the growth model is expressed as:

$$lnY_{jt} = \alpha + \beta_1 lnPOP_{it} + \beta_2 lnTRD_{it} + \beta_3 lnFDI_{it} + \beta_4 lnMTEL_{it} + \beta_5 lnFTEL_{it} + \beta_6 k_{it} + \beta_7 TEL_{it} + \mu_{it} \quad (14)$$

Using the PMGE method, equation 14 is estimated as:

$$\Delta lnY_{jt} = -\emptyset\,(-\delta_1 lnPOP_{it} - \delta_2 lnTRD_{it} - \delta_3 lnFDI_{it} - \delta_4 lnMTEL_{it} - \delta_5 lnFTEL_{it} - \delta_6 lnk_{it} - \theta_{0t}) + \beta_1 \Delta lnPOP_{it} + \beta_2 \Delta lnTRD_{it} + \beta_3 \Delta lnFDI_{it} + \beta_4 \Delta lnMTEL_{it} + \beta_5 \Delta lnFTEL_{it} + \beta_6 \Delta lnk_{it} + \beta_7 \Delta lnTEL_{it} + \mu_{it} \quad (15)$$

3.5 Theoretical Framework of the Gravity Model (Effect of telecommunication on trade)

In 1960's, Tinbergen and Poyhonen independently proposed that the gravity model can be on trade flows of member countries. They specified a generalized gravity model whereby trade flows between two countries i and j, () are explained by the countries' economic sizes (GDP_i and GDP_j), and the direct geographical distance between them (D_{ij}).

$$Trade_{ijt} = A * \frac{(GDP_{it}{}^{\alpha_1} * GDP_{jt}{}^{\alpha_2})}{D_{ij}^{\alpha_3}} \quad (16)$$

The above general gravity model has been modified by trade economists such as Berstrand (1985), Helpman (1987), Mátyás (1997), Soloaga and Winters (2001), and Limao and Venables (2001) to include other variables affecting trade between the trading countries. Such variables include institutional characteristics such as free trade agreements and Common Unions, infrastructure development, real exchange rates, common language, colonial ties and common borders among others. The augmented gravity equation is specified as:

$$Trade_{ijt} = \alpha_0\, GDP_{it}^{\alpha_1}\, GDP_{jt}^{\alpha_2}\, D_{ij}^{\alpha_3}\, INFR_{it}^{\alpha_4} RER_{ijt}^{\alpha_5} \sum \delta_h A\varepsilon_{ijt} \quad (17)$$

Where INFR denotes infrastructure, RER denotes real exchange rates, and A represents dummies of common language, border, trade agreement or customs union among others. The current study adopts a gravity model specified by Ismail and Mahyideen (2015) such that;

Where $Dist_{ij}$ distance in kilometers between capitals of countries j and COMESA headquarters, $lang_{ij}$ is dummy for common language where 1 is when COMESA member states and trading partners have the same language or otherwise 0, μ_{it} is the error term and the other variables are as defined before.

$$TRD_{ijt} = \alpha + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} + \beta_3 lnDist_{ij} + \beta_4 lnlang_{ij} + \beta_5 lnMTEL_{it} + \beta_6 lnFTEL_{it} + \mu_{it} \quad (18)$$

3.6 Definition, Measurement and Expected Signs of Variables

Economic growth is proxied by real GDP. It is measured at current prices (US dollars). GDP_{it} is GDP for COMESA while GDP_{jt} is GDP for COMESA trading partner.

Population Growth rate (POP) is the exponential rate of growth of midyear population over time and is expressed as a percentage of the number of individuals in the population of a country. It is expected to have a negative sign in relation to economic growth.

Mobile teledensity (MTEL) refers to the number of mobile phone subscribers per 100 persons. It is used to proxy telecommunication infrastructure. It is expected to be positively related to economic growth.

Fixed line teledensity (FTEL) is the number of fixed line phone subscribers per 100 persons. It is also used to proxy telecommunication infrastructure. Similar to MTEL, it is expected to have a positive sign.

Foreign Direct Investment (FDI) is the amount of investment from abroad as a share of GDP. It is expected to be positively related to economic growth in the region.

Gross fixed capital formation (k) refers to the physical capital and is measured by gross fixed capital formation relative to GDP. It is expected to have a positive sign.

Distance (dist) refers to distance in kilometers between capitals of trading partners. It is measured in kilometers. In relation to trade volume, it is expected to have a negative sign because more trade occurs between economies within a short distance.

Common language (Lang) is dummy for common language where 1 is when COMESA member states and trading partners have the same language or otherwise 0. It is expected to have positive effect.

Trade (TRD) the total country's export and imports. It is measured at current prices (US dollars).

3.7 Data Type and Sources

The study applied secondary data from various statistical abstracts. The data on gross domestic product, mobile cellular subscribers, fixed telephone line subscribers, population growth, fixed capital formation and were obtained from World Bank[19]. Data on distance was computed from MAPCROW and Google map calculator while data on trade (imports and exports) was extracted from COMSTAT[20]. The data on all variables, except distance, was annual observations from 1980 to 2015.

19 World Bank Group. (2016). Kenya (Data). Retrieved 2017, from World Development Indicators (WDI) Online Database.
20 COMESA. (2013). COMESA statistics database (COMSTAT). Retrieved from http://comstat.comesa.int/Home.aspx.

4.0 Results and Discussions

4.1 Descriptive statistics

The descriptive statistics of the variables is presented in appendix 1. The results show that the average economic growth rate for COMESA region over the study period is 26.991 percent. This could be attributed to the deepening intra-COMESA trade as well as extensive trade with non-COMESA member states given that total trade amounted to an average of 20.846 percent of GDP over the study period. It is also interesting to note that the telecommunication infrastructure (LTEL) has had significant growth over the study period. On average the total telephone penetration is 3.905 percent. The fixed line telephone penetration is lower (an average of 1.427 percent) as compared to the mobile teledensity which has an average of 3.732 percent. This could be as a result of the many advantages that accrue to the mobile cellular users.

4.2 Unit root test results

The study adopted the Im-Peseran-Shin panel unit-root test developed by Im, Pesaran and Shin (1997) to establish the presence of a unit root and the order of integration of the variables. The results of the panel unit-root test are presented in appendix 2.

The results showed GDP (both COMESA and trading partner), population growth, telecommunication and trade were stationary at levels and integrated of order zero, I(0). On the other hand, FDI, mobile teledensity and fixed line teledensity were non-stationary at levels. However, upon first differencing, they all become stationary and thus are integrated of order one, I(1).

4.3 Hausman test results for Fixed Effect Model and Random Effect Model

Using the Hausman test, the FE model was selected over RE as shown in Table 4.3.

Table 4.3 Hausman Test

Correlated RE (Hausman test)		
Test Summary	Chi-Square Statistics	Probability
Cross-section random	306.955709	0.0000

Source: Authors computation

4.4 Causality test results

Table 4.4 Causality test results

Null Hypothesis: Prob.	Obs	F-Statistic
Telecommunication does not Granger Cause Gross domestic product$_j$ 0.35047 0.7046 Gross domestic product$_j$ does not Granger Cause Telecommunication 1.55302 0.2132		328
Trade does not Granger Cause Gross domestic product$_j$ 0.0681 Gross domestic product$_j$ does not Granger Cause Trade 0.0027	328	2.70979 6.0118
Trade does not Granger Cause telecommunication 0.0133 Telecommunication does not Granger Cause Trade 0.4641	328	4.3750 0.76957

Source: Authors own computation

The results in table 4.4 show that trade do not Granger-cause telecommunication. This implies that there exists a unidirectional causality running from telecommunication infrastructure to trade in COMESA region. The finding underscores the important role of telecommunication infrastructure in boosting intra-COMESA trade. Improved telecommunication infrastructure in COMESA region would reduce transaction costs, improve communications between firms and trading partners and provide an efficient framework for different service deliveries. The findings are in line with studies conducted by Kaur and Malhotra (2014) and Ismail and Mahyideen (2015) for India and Asia respectively.

The results also indicate that economic growth do not Granger-cause trade. This, similarly, indicate that there exists a unidirectional causality from trade to economic growth in COMESA region. Thus, growth in intra-COMESA trade would cause growth in the economies of member states and COMESA as a bloc. The finding is consistent with the works of (Kaur and Malhotra, 2014) who revealed that trade in India not only created employment and generated income for individuals but also increased gross domestic product for the country. Based on these results, COMESA should aim at policies that encourage trade in the region as this will stimulate economic growth.

Lastly, it is evident from the results that there is no causal relationship between telecommunication infrastructure and economic growth in COMESA region.

4.5 Telecommunication and Economic Growth

The results of the effect of telecommunication infrastructure on economic growth are shown in Table 4.5.

Table 4.5 Effects of Telecommunication on Economic Growth.

Dependent variable GDP of COMESA as a bloc			
Independent variable	**Coefficient**	**Standard Error**	**P-value**
Foreign direct Investment	-0.0042	0.0107	0.6923
Mobile teledensity	0.3803*	0.0813	0.0050
Fixed line teledensity	-0.0598	0.0458	0.1927
Trade	0.1628*	0.0311	0.0026
Population growth	-0.0796**	0.0252	0.0318
Telecommunication	0.2992*	0.0315	0.0042
Capital formation	0.0644	0.0577	0.2647
Overall R^2 0.7066			
F-statistic 16.314	Probability 0.000		

*The asterisks, * and ** denote 1%, and 5% significance levels respectively*

Source: Authors own computation from study data.

The results show that all the variables have the expected signs except foreign direct investment and fixed line teledensity. Mobile teledensity is positively related to economic growth and its coefficient is significant at one percent level. A one percent increase in mobile teledensity increases economic growth by 0.38 percent in COMESA region. The results compare with Lapukeni (2016).

On the contrary, the coefficient of the fixed line teledensity is negative and insignificant. The coefficient of population growth is negatively related to economic growth in COMESA region as expected and significant at 5%. This could be attributed to the fact that a lower population growth rates results to a higher level of GDP per capita and vice versa.

The effect of trade on economic growth is positive and significant. A one percent growth in trade results in a 0.16 percent economic growth. This implies that COMESA member states with greater global interaction achieve higher economic development. Physical capital proxied by foreign direct investment and gross capital formation is not statistically significant.

4.6 The Gravity Model Empirical Results

The results of the gravity regression model, as shown in table 4.6, show that all the coefficients of variables are significant and with the expected signs. The overall R^2 is 0.913 indicating that about 91 percent of the variations in COMESA trade are explained by the its GDP and that of the trading partners, the distance between the countries' capital cities, mobile teledensity, fixed teledensity and a common language dummy.

Table 4.6 Gravity regression results

Variables	Coefficient	Z Values	P-Values
GDP COMESA	0.3095178*	3.65	0.000
GDP Trade Partners	0.7663409*	13.94	0.000
Distance	-0.648784*	-3.51	0.000
Mobile teledensity	0.0076678	0.16	0.875
Fixed line teledensity	0.471002***	1.97	0.063
Telecommunication	0.572993***	2.36	0.052
Common language	0.3891325***	1.68	0.094
Constant	-1.557723	-0.65	0.516
Overall R^2	0.9130		
Wald $chi^2(6)$	703.11		
Prob > chi^2	0.0000		
No. of Obs.	316		

*The asterisks *, ** and *** denote that the coefficient is statistically significant at 1%, 5% and 10 % levels respectively.*

The coefficient of GDP for COMESA and that of trade partner are positive and significant whereby the elasticity of trade with respect to economic growth suggests that for every percentage increase in GDP of COMESA and of trading partner, trade increases by about 0.31 and 0.8 percent respectively. The finding is consistent with Karamuriro (2015).

The coefficient of the distance between headquarters of COMESA and the capital cities of the trading partners is negative and significant. This implies that for every additional kilometre covered between Lusaka and the capital city of the COMESA trade partner,

trade reduces by about 0.65 percent. The findings are consistent with Ouma (2017) and Karamuriro (2015) but contrary to Frankel (1997).

The result for telecommunication was found to be positive and significant. This underscores the important role of telecommunication (both fixed line and mobile teledensity) on boosting intra- COMESA trade. The findings indicate that a one percent increase in telecommunication increases trade within COMESA region by 0.57 percent.

The results on existence of common language show that the coefficient of the dummy for common language is significant and positive. This suggests that speaking a common language between countries enhances trade by about 0.4 percent. The results are consistent with Ouma (2017), Ismail and Mahyideen (2015) and Karamuriro (2015).

5.0 CONCLUSION AND POLICY IMPLICATIONS

5.1 Conclusions

The study focused on the role of telecommunication on trade and economic growth in COMESA region. The study concludes that there exists unidirectional causality from telecommunication infrastructure to trade and similarly a unidirectional causality from trade to economic growth. This underscores the importance of a well-developed telecommunication infrastructure in boosting regional trade as well as improving economic growth of member states.

The study also established that mobile teledensity plays a critical role in enhancing the regional economic growth. Therefore, the telecommunications infrastructure and its related services act as a source of economic growth in COMESA region. Other than mobile teledensity, increase in intra-COMESA trade leads to economic growth.

In relation to trade, the study established that telecommunication infrastructure, common language and GDP for COMESA and that of trading partner positively influenced trade within the COMESA region. Distance between trading partners also influenced trade negatively. That is an increase in distance between COMESA and trading partners lowered trade.

5.2 Policy Implications

Based on the empirical results, this study recommends that COMESA and the respective governments in the member states implement strategies that will enhance telecommunication infrastructure within the member states. Specifically, COMESA and respective governments of Member States should establish a digital inclusion programme aimed at transforming COMESA to a “digital COMESA”. That is a COMESA

bloc where mobile cellular phone is not only for communication purposes but also for doing business and conducting trade. The program would be in line with the COMESA Digital Free Trade Area (DFTA) that aims at empowering traders to do cross-border trade using ICT as a tool to minimise physical barriers (COMESA, Undated).

The program should aim at expanding telecommunication connectivity and increase mobile internet adoption by addressing the main barriers to mobile access and internet access, both in COMESA region and Africa at large. To achieve this objective, the program should address three main challenges in telecommunication sector namely; network infrastructure coverage, affordability and digital literacy. COMESA Secretariat and Member States should first ensure increased network coverage to currently unserved areas within COMESA region. Secondly, they should make it affordable not only to own a mobile phone but also to use the phone. This can be achieved through lowering of taxes on airtime, handsets and other phone accessories.

Lastly, respective Member States with the support of COMESA Secretariat should work towards digital literacy and availability of local content. The attainment of digital literacy would ease the implementation of DFTA segments which include; E-Trade, E-Logistics and E-Legislation (COMESA, Undated). For instance, traders would easily market and sell their goods and services across borders without physical movements. Therefore, the Member States should aim at availing mobile content in both the national and local languages so as to increase mobile cellular usage as well as the adoption of mobile internet services.

Acknowledging the fact that effective telecommunication infrastructure bridges the information gap, the governments within the COMESA region and network service providers should purpose to lower roaming charges within COMESA region. A high level of call charges when abroad constrains information flow given that roaming charges are several times higher than domestic mobile charges. COMESA should opt for regulation in the sector through price caps on roaming charges. This would reduce exploitation of customers by network and service providers. COMESA should therefore, adopt strategies put in place by East Africa Community (EAC) and European Union (EU) who have successfully abolished roaming charges within their Member States. For instance, the countries of the EAC made a joint commitment in 2014 to create One Network Area (ONA) for the five Partner States of EAC (Burundi, Kenya, Rwanda, Tanzania, Uganda), with the benefits being extended to South Sudan. Specifically, for cross-border traffic originating in those countries, rates were capped and mobile roaming charges eliminated (Kelly & Kemei, 2016). Similarly, European Union (EU) abolished the roaming charges within EU countries on 15th June 2017 (Council of the EU, 2017). According to Council of the EU, (2017) British mobile phone users could make phone calls, send text messages and use data in other EU countries without any charge.

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Appendix

Appendix 1: Descriptive Statistics

	Mean	Standard Deviation	Minimum	maximum	Skweness	Kurtosis
GDP COMESA	26.991	0.369	26.258	27.486	0.527	2.264
Mobile teledensity	3.732	1.214	-0.617	5.270	-1.153	3.729
Population growth	0.449	0.833	-3.849	2.710	-1.242	6.906
Telecommunication	3.905	1.209	0. 292	5.352	-0.942	3.037
Trade	20.846	1.984	16.257	24.466	-0.199	2.044
Foreign direct Investment	0.776	1.239	-6.389	3.990	-1.803	10.181
Fixed line teledensity	1.427	1.858	-5.096	4.175	-0.315	2.396
Gross Capital Formation	3.056	0.404	0. 693	3.818	-1.550	10.391

Source: Constructed from the study data

Appendix 2: Panel Unit Root Test –Im, Pesaran and Shin (IPS)

Variables	Levels		First difference		Conclusion
	Constant, no trend	Constant trend	Constant no trend	Constant trend	
$LGDP_j$	-2.40857*	-2.35343*	-	-	I (0)
$LGDP_i$	-0.88814*	0.18729**	-	-	I (0)
LPOP	-10.6501*	0.85493*	-	-	I (0)
LTEL	-6.44904**	0.13529**	-	-	I (0)
LTRD	-2.77982**	-0.24939**	-	-	I (0)
LDIST	0.19857*	-2.29908*	-	-	I (0)
LFDI	-2.83208	-0.86976	-5.66249*	-1.56863*	I (1)
LFTEL	0.92845	-0.58317	-5.01351*	-2.03582*	I (1)
LMTEL	-6.72077	0.39047	1.55996*	-0.33549*	I (1)

*The asterisks, * and ** denote 1%, and 5% significance levels respectively. I(0) and I(1) denote integration of orders zero and one respectively. Source: Authors own computation from study data.*

Potential for Intra- COMESA
Processed Food Products Trade

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Abstract

This study used the gravity model to analyze the determinants and potential for intra-COMESA trade in processed foods. The findings show that the size of the economy, difference in per capita GDP, multilateral trade resistance, multiple membership to RTAs, infrastructural development and political stability, common language and sharing a common colonial heritage contribute to increased intra-COMESA trade in processed foods. The distance between two trading partners, devaluation of exchange rate, land-lockedness or being an island and sharing a common official language affect intra-COMESA trade in processed products negatively. Results show that most COMESA Member States have potential to increase their intra-COMESA trade in processed food products. Comoros, Madagascar, Mauritius, Seychelles, Sudan and Zambia were found to be trading heavily with other COMESA Member States.

The study recommends the need for Member States to increase their processing capacities in processed food products, through increased investments in agro- value addition, food processing and trade supporting infrastructure with a view to lowering costs of processing and transportation respectively. COMESA Member States should eliminate trade barriers and redesign COMESA rules of origin to support food processing.

Introduction

1.1 Background information

Over the last two decades, global trade in processed food products has increased more than trade in non- processed food products (in both volume and value). Trade in processed food has more than doubled over this period (Liapis, 2011; WTO, 2014). Although exports of processed products have been dominated by the high income countries, exports from middle and low income countries have increased more dramatically tripling and even quadrupling over that period (Liapis, 2011). The driver of this increased trade growth has been increase in global demand of processed foods which is fueled by increase in income and urbanization (Allan and Josling, 2000; WTO, 2014). The increase in this trade is attributed mainly to increased exports of these products from the developing countries as a result of trade liberalization and increased technology.

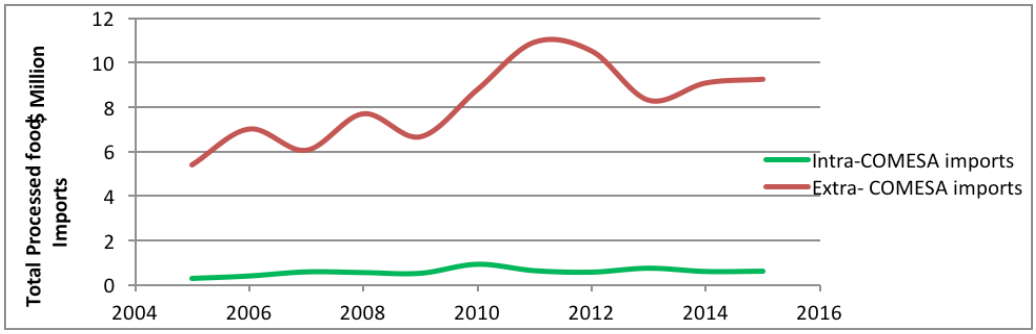
In the Common Markets for Eastern and Southern Africa (COMESA), food processing is important for the region's industrialization as a significant proportion of the region's manufacturing sector is agro- based and a significant proportion of manufacturing trade in the region is on processed foods. For the East African Partner States (four of which are COMESA Member States) for example, agro-processing has been identified as one of the six strategic sectors in which the region has potential comparative advantage, which also form the region's industrial base and are important for the region's realization of its industrialization objective (EAC, 2012).Trends in COMESA trade particularly imports in processed food has followed the global trends in processed food trade suggesting an increase in regional demand for such products.

Intra- COMESA trade including trade in processed foods has also been on the increase as shown in Figure 1. COMESA extra-regional imports of processed foods are 14 times the size of intra regional imports. Intra-regional trade in processed foods however has remained relatively low over the last 15 years. Similarly, COMESA exports relatively more processed foods outside the region compared to intra-regional exports. Annex 1 compares the structure of intra-COMESA processed food imports with those imported from third party countries.

Intra-COMESA trade in processed food products is dominated by vegetable and animal oils and fats, sugar and grain mill products, accounting for over 50 percent of the value of the total intra-COMESA processed foods trade. Extra-COMESA imports of processed food products on the other hand are dominated by wines, meat and vegetable and animal oils and fats accounting for about 57 percent of the total imported processed foods in the region. Vegetable and animal oils and fats; sugar; grain mill products; fish and fish products; fruit and vegetables; and soft drinks and mineral water are among the

top products imported both intra and extra- COMESA.

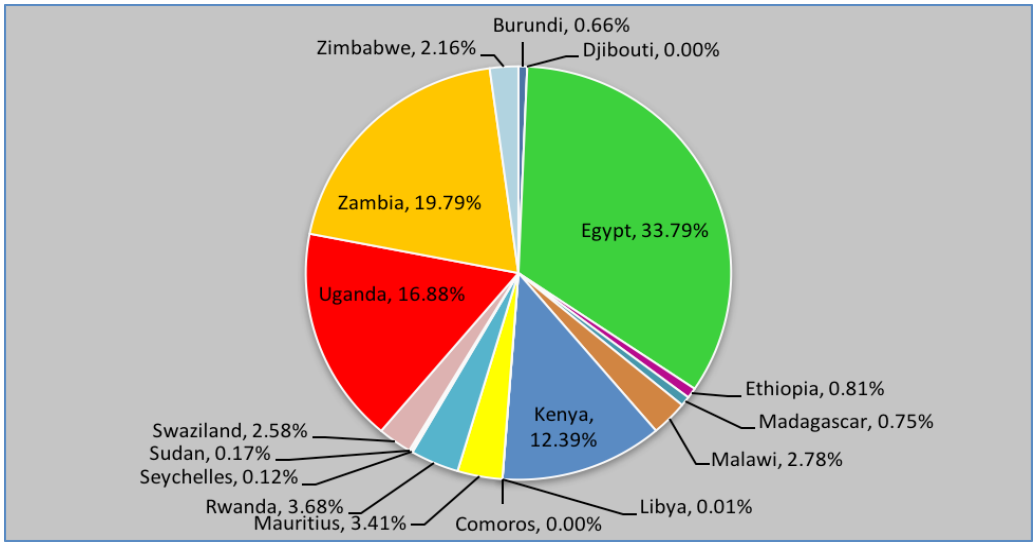
Figure 1: COMESA Intra and Extra- Trade in Processed Food Products (2005-2015), US$ M



Source: COMTRADE database accessed through WITS

Most of the processed food imports in the region originate from extra- COMESA region although majority of COMESA Member States have Revealed Comparative Advantage (RCA) in processed and semi-processed food products (Sukati, 2016). Within COMESA, Egypt stands out as the country with the largest share of the Intra-COMESA exports in processed food products, followed by Zambia, Uganda, Kenya and Rwanda. Comoros, Djibouti, Libya and Seychelles make up the smallest share of Intra-COMESA's exports in processed food products as shown in Figure 2.

Figure 2. Share of Total Intra-COMESA Trade in Processed Food Products by Member States (2005-2015)



Source: COMTRADE database accessed through WITS

1.2 Objectives of this study

The main objective of this study is to determine the potential of trade in processed food products in COMESA region.

More specifically, the study seeks to:

i. Identify factors affecting bilateral trade in processed food products in COMESA region.

ii. Determine potential for intra- COMESA trade in processed foods.

2.0 Review of Literature

The available literature on intra-regional trade uses the analytical framework of economic interactions inspired by Newton's law of gravity. In this approach, the level of intra-regional trade is determined by the economic size of trading countries and distance between them (Anderson, 1979). However, new empirical studies have considered addition of trade resistant factors in this gravity model approach. Available literature on intra-COMESA agricultural trade using the gravity model analyzes the determinants of agricultural trade at the aggregate levels without disintegrating into the various categories of the commodities traded.

The gravity model has been used to analyse bilateral trade in processed products trade in other regions. Liapis (2011) used a gravity framework to understand the reasons processed products trade across national borders among the OECD countries. Their results show that sharing of borders, use of a common language, and sharing a common colonial heritage had a higher probability of increasing bilateral trade in processed products. These countries also have a higher probability in establishing new trading partnerships as well as trading in diversified export products. The author further explored the effects of tariffs on trade in processed products and found out that reduction in applied tariffs significantly increases bilateral trade in individual processed products. The traditional gravity variables; incomes, distance, cultural and geographic characteristics also influence the amount of processed products traded among the OECD countries, however policy makers can do little to control such factors.

Kalaba and Kirsten (2014) investigated the trade patterns of agricultural and processed products in SADC using the Balassa revealed comparative advantage method and an augmented gravity model. The study found that SADC had comparative advantage in agriculture, which the region could be losing. However, the comparative advantage in processed and high value agriculture products is low and was only found in a few countries.

Karim and Ismail (2007) investigated the potential of COMESA intra-regional trade in agricultural commodities among Sudan, Egypt and Kenya. They constructed several trade indices that included the instability index, correlation coefficient matrix, production similarity index, comparative production performance, export similarity and revealed comparative advantage measures. The study found that there is a great potential for expanding intra-regional trade, especially in agricultural commodities, among COMESA countries due to different patterns of specialization.

Ebushra et al (2011) adopted an augmented gravity framework to assess the role of COMESA in promoting intra-regional agricultural trade between Sudan and COMESA countries. They used descriptive analysis and multi market model with Armington non-linear specification- to analyze the potential of Sudan trade in agricultural commodities with COMESA Member States. They found that that there was potential for trade between Sudan and COMESA Member States and that Sudan could increase its agricultural trade potential in cotton, sesame and live animal to COMESA Member States.

Elmorsy (2015) used cross sectional data to identify determinants of trade intensity between Egypt and COMESA member States. The study found that there were potential trade opportunities for Egypt to increase trade with COMESA Member States. A similar study conducted by Geda and Seid (2015) used an augmented gravity model to examine the potential for intra-African trade. Following a study by Geda and Kebret (2008), the study found that there was significant potential for intra-African trade, which could not be easily realized. Further, by using Van Beers and Lineman approach the authors also found that the potential for intra-Africa trade was modest and not as large as implied by the gravity model.

3. Methodology

3.1 Model Specification

The study uses gravity model to identify the factors that determine intra-COMESA trade potential in processed food products and to predict the level of trade in processed food products that should be existing in COMESA given the prevailing trade conditions. The traditional gravity model is augmented to include other factors that may impact intra-COMESA processed food trade. The Augmented gravity model used in this study is presented in equation 1.

$$Ln(Tot_{ijt}) = \beta_0 + \beta_1 Ln(GDP_{it}) + \beta_2 Ln(GDP_{jt}) + \beta_3 Ln(D_{ij}) + \beta_4 Ln(GDPPCdif_{ijt}) + \beta_5 \Omega_{it} + \beta_6 \Omega_{jt} + \beta_7 \Omega_{ijt} + \varepsilon_{ijt} \quad \ldots\ldots(1)$$

Where Ln is the natural logarithm, Tot_{ij} is the bilateral total trade in processed foods between two COMESA member countries (i and j). GDP_i and GDP_j are incomes of the exporting and importing COMESA member country respectively expressed in USD and are used as a proxy of the size of the economy. A large economy (larger GDP) for both importer and exporter is expected to have a positive impact on trade flows. D_{ij} is the physical geographical distance between the exporter and importer (expressed in KMs) between the trading partner's capital cities. It is assumed that the larger the distance between trading partners the lesser the trade.

$GDPPCdif_{ij}$ is the difference in GDP per capita between the two trading partners. The GDP per capita difference measures factor endowments and/or the differences in technological advancement between two countries as a key driver of their trade relationships (Heckscher-Ohlin theory). Furthermore, it can also be used to test the Linder hypothesis that suggests that countries with similar per capita income levels are likely to trade more (Linder 1961). The effect of this variable may either be positive or negative. A positive sign suggests the Heckscher-Ohlin hypothesis while, a negative sign would suggest the Linder hypothesis.

Ω represents other factors which could affect intra- COMESA trade in processed foods. These include: multilateral trade resistance, real exchange rate (EXR_{ij}) between the two trading partners, membership to COMESA free trade area, multiple membership to RTAs, number of documents to import or export, infrastructure index, political stability, geographical factors (island status, landlockedness and sharing a border); and historic and cultural ties variables (common official language; common ethno language; common colonizer). $\mathcal{E}$ is the error term.

The multilateral trade resistance is proxied in this model by a remoteness index (REM_{it}, REM_{jt}) formulated using the specification by Wei (2000), as the exporter's and importer's weighted distance to all other countries in the world:

$$REM_{it} = \sum_{i \neq j} w(i) \log\left[Dis(i,j)\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

$$\text{Where } w(i) = \frac{Totalprocessedfoodproductsexportsofi}{Totalprocessedfoodproductsworldexports}$$

$$REM_{it} = \sum_{i \neq j} w(j) \log\left[Dis(i,j)\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$$\text{Where } w(j) = \frac{Totalprocessedfoodproductsimportsofj}{Totalprocessedfoodproductsworldimports}$$

Membership to COMESA free trade area was used to capture the effects of applied tariffs for processed agro-food products because of the scarcity of data on the actual variable. The study proxied tariff measures by constructing a dummy variable ($REC\ Overlap_i$, REC

$Overlap_j$) based on country membership to different RTAs (excluding COMESA).

The number of documents to import or export was used to capture administrative burdens in intra-COMESA trade. To capture the effects of infrastructural development on intra-COMESA trade in processed food products trade, the model used Africa Infrastructure Development Index (AIDI). The indicator variable for infrastructure is captured both for the exporting and importing countries ($Infra_i$, $Infra_j$). The study also included political stability variable to measure the effects of institutions on intra-COMESA trade in processed food products. The variable on political stability and absence of violence/ terrorism comprises estimated scores ranging from around -2.5 to 2.5 that capture the perceptions of "the likelihood of political instability and/or politically motivated violence, including terrorism." (Kaufmann et al., 2011).

Further, the model included other control variables (geographic location, cultural and historical ties) that may influence bilateral trade in agro-processed food products in COMESA. The geographical location is captured by three dummy variables on sharing border (AD_{ijt}), landlockedness ($LandLock_i$, $LandLock_j$) and the island status (Islandi, $Island_j$). Linguistic ties between trading partners is captured by two dummies (Official and Ethno-language) and a dummy variable on sharing a common colonizer ($comcol_{ij}$) is used to control for the effect of historical links on agro-processed trade flows.

3.2 Data types and sources

This study covers the period 2005 to 2014 and used data from Trade Analysis Information System (TRAINS) database, Infrastructure index was obtained from the African Development Bank. Other data used in the model were obtained from World Development Indicators (WDI) and Centre d'Etudes Prospectiveset d'Informations Internationales (CEPII).

3.3 Model Estimation Methods

We use Heckman selection and Poisson Pseudo-Maximum Likelihood (PPML) estimation methods. The estimation procedures were preferred because of data gaps on trade in processed foods for some COMESA Member States and how these estimation techniques address the issue of zero trade flows.

In estimating the gravity model using the Heckman selection method, the study used a generalized gravity equation for both the selection and outcome equations. The dependent variable for both estimations is a logarithm of total trade of processed food products. The GDP, distance and difference in GDP per capita variables are expressed in natural logarithm and the estimated coefficients are interpreted as elasticities.

3.4 Diagnostic Tests

The pre-estimation test results for this study are reported in Annexes 3 and 4. Different variables used in the study did not show significant correlation. A panel unit root tests to investigate a potential cointegration between time-variant variables in the gravity model was performed using Levin, Lin and Chu (LLC) method (Levin et al., 2002) and Hadri method (Hadri, 2000). The results of these tests are presented in Annex 5. The unit root test results of the LLC test show that all variables are stationary except total bilateral trade and exporter's and importer's remoteness index. The results of Hadri test show that all variables are stationary and there was no need to test for cointegration of the time variant variables.

Further, the study compares the actual and predicted values to estimate trade potential of processed food products as adopted in recent studies by Geda and Seid (2015) and Zaki et al. (2015). Ratio less than one means that the actual trade is lower than predicted, and hence the two countries have opportunities (potential) to expand trade with the potential being based on the current trading levels and the conditions specified in the gravity model. If the ratio is greater than one, then trade between two countries has exceeded the potential estimated by the model.

4.0 Results and Discussion

4.1 Factors Determining Trade in Processed Foods in COMESA

The results of the gravity model estimated using the Heckman selection and PPML methods are shown in Table 1. The size of the economy of a COMESA Member State is an important determinant of trade in processed foods. The large coefficient of the exporters GDP suggests that the ability of a COMESA Member State to export is a more important determinant of intra-regional trade in processed foods than the demand related factors (ability to import and tastes and preferences). Countries with a high GDP are likely to export more processed products in COMESA as they are to invest in the processing and hence export more.

Results show that as the distance between two trading partners increase, the countries are likely to trade less with each other. A higher distance between two trading partners signifies a higher transportation cost as most of intra-COMESA trade is through road transport. As the difference in GDP per capita between two COMESA Member States increases, the countries are likely to trade more in processed food products. This suggests that differences in technological factors are important determinants of intra-COMESA trade in processed food products.

Table 1: Gravity Model Estimation Using Heckman Selection & PPML Methods

Estimation	**Heckman Selection Model**		**PPML**	
Variables	**LnTot**		**LnTot**	
	Coefficient	*Std.Error*	*Coefficient*	*Std.Error*
lnGDPi	0.4171**	(0.2097)	0.0746***	(0.0078)
lnGDPj	0.2062*	(0.1159)	0.0357***	(0.0070)
lnDij	-1.5436***	(0.3468)	-0.1830***	(0.0139)
lnGDPPCdifij	0.2069**	(0.0841)	0.0196***	(0.0071)
REMi	3.7603***	(0.9150)	0.2726***	(0.0454)
REMj	11.0669***	(2.0554)	0.6490***	(0.2075)
EXRij	-9.3205***	(1.4478)	-0.8551***	(0.1027)
COMESAFTA	-0.4369*	(0.2246)	-0.0282	(0.0201)
RECi	0.0677	(0.2178)	0.0237*	(0.0143)
RECj	-0.0256	(0.2094)	0.0047	(0.0180)
Doc_imp	-0.0405	(0.0414)	0.0014	(0.0024)
Doc_exp	0.0609	(0.0572)	0.0026	(0.0045)
INFRi	-0.0064	(0.0076)	0.0007*	(0.0004)
INFRj	0.0228***	(0.0061)	0.0022***	(0.0004)
Polstabi	0.2787*	(0.1582)	0.0164	(0.0114)
Polstabj	0.4286***	(0.1443)	0.0349***	(0.0110)
LandLocki	-3.4103***	(0.5553)	-0.1498***	(0.0220)
LandLockj	-1.3188***	(0.2626)	-0.0951***	(0.0202)
Islandi	-3.2967***	(0.6021)	-0.1400***	(0.0289)
Islandj	-1.1720***	(0.3733)	-0.1137***	(0.0293)
ADij	1.0057***	(0.3316)	0.0370*	(0.0190)
OffLangij	-1.4377***	(0.2393)	-0.1119***	(0.0176)
EtLangij	0.4771*	(0.2502)	0.0442**	(0.0191)
ComColij	0.7827***	(0.1965)	0.0765***	(0.0152)
Constant	14.4968**	(6.1733)	1.4372***	(0.2455)
	No. of Observations =3,168 Censored observation = 1,799 Uncensored observation = **1,369**		No. of Observations = **1,369**	
	Mills lambd -1.8323***(0.6076); Tangent of Rho: -0.61681; ln (sigma) 2.9707062		R-squared, 0.4400	

Note: *** p<0.01* ** p<0.05, * p<0.10

Multilateral trade resistance (MTR) is positive and significant. This suggests that good trading relations between COMESA Member States is likely to lead to increased intra-regional trade in processed foods. This underscores the need for COMESA Member States to improve on trading relations including implementing deep integration measures which better facilitate intra- regional trade.

Exchange rate devaluation affects intra- COMESA trade in processed foods negatively. Contrary to expectations, the COMESA FTA negatively affects trade in processed food products. These findings are in line with Geda and Seid (2015) who found a significant and negative effect of membership to COMESA in intra-African trade. The dominance of few COMESA countries (e.g. Egypt, Kenya, Zambia and Uganda)1 in agricultural trade (including trade in processed food products); and production of similar agricultural/ agro-processed food products and trading with fixed trading partners can explain the significance or negative influence of COMESA FTA on the overall intra-COMESA trade in such products.

An exporting country which has multiple membership in various RTAs is likely to trade more in processed foods while multiple membership is not an important determinant of processed foods trade for an importing country. The number of documents required for both export and import processes were found not to have an effect on intra-regional trade in processed foods while infrastructural development and political stability were found to affect intra-COMESA trade positively.

Land lockedness and island status affect intra-COMESA trade negatively. These two factors reinforce the distance factor. Islands are separated from mainland centers of consumption, hence the countries experience high transportation costs. Similarly, landlocked countries face transit related challenges which increase transportation costs of processed foods. Sharing a border, speaking a common language and having a common colonial heritage also affect intra-COMESA trade in processed foods positively. Contrary to expectations, sharing a common official language does not lead to increased trade.

4.2 Estimating Trade Potential in Processed Food Products

The model estimated intra-COMESA trade potential for fifteen (data for DR Congo, Eritrea, Libya and Swaziland were found missing) COMESA Member States and the results are shown in Table 2. The results show that 10 Member States were found to be trading below their predicted trade potential level and therefore have potential to increase their trade in processed foods with other COMESA Member States. This potential however varies from country to country being highest for Burundi (currently trading at 0.5% of

1 In 2014, about 80 percent of intra-regional agricultural trade was accounted for by four countries including Kenya, Zambia, Egypt and Uganda (TRAINS data).

its predicted potential trade value) and lowest for Egypt whose current trading value is about 99% of its predicted trade potential value.

Comoros, Madagascar, Mauritius, Seychelles Sudan and Zambia were found to be trading heavily with other COMESA Member States in agro-processed food products. For the Island countries, agricultural export activities are concentrated on a few commodities, however the simulated results shown in Table 2 shows that agro-processing is a vital source of economic development.

Table 2: Intra-COMESA Trade Potential in Processed Food Commodities

Exporter	Total Actual Trade (in Millions USD)	Total Predicted Trade (in Millions USD)	Trade Potential (Actual/ Predicted)	Actual trade / predicted trade (%)
Burundi	255.487	55019.746	0.005	0.5
Comoros	22.312	4.165	5.357	535.7
Djibouti	3.802	60.148	0.063	6.3
Egypt	3533.522	3568.552	0.990	99
Ethiopia	332.466	402.435	0.826	83
Kenya	2257.010	14534.443	0.155	15.5
Madagascar	635.862	115.189	5.520	552
Malawi	425.541	718.372	0.592	59.2
Mauritius	948.885	132.520	7.160	716
Rwanda	1169.837	2172.225	0.539	53.9
Seychelles	65.581	13.531	4.847	484.7
Sudan	420.943	170.060	2.475	247.5
Uganda	2753.767	39888.753	0.069	6.9
Zambia	2329.671	1221.524	1.907	190.7
Zimbabwe	842.375	7375.037	0.114	11.4

Source: Author computation based on Gravity Model estimated by PPML

5.0 Conclusions and Recommendations

This study identified the determinants and potential for intra- COMESA trade in processed food products. The findings showed that the size of the economy, difference in per capita GDP of two trading partners, multilateral trade resistance, multiple membership of an exporting country, infrastructural development, political stability, common language and common colonial heritage contribute to increased intra-COMESA trade in processed food products. The distance between two trading partners, devaluation of exchange

rates, landlockedness, island status and common official language affect intra-COMESA trade in processed food products negatively.

The results show that 10 COMESA Member States have trade potential in processed food products. Comoros, Madagascar, Seychelles, Sudan and Zambia were found to be trading heavily with other COMESA member countries. The study concludes that there is potential to increase intra-COMESA trade in processed food products.

The study recommends that, Member States should increase their processing capacities through increased investments in agro- value addition; food processing and trade supporting infrastructure. COMESA Member States should eliminate trade barriers and redesign COMESA rules of origin to support food processing.

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Annex 1: Intra- and extra- COMESA imported processed food products (2005-2015)

Intra-COMESA imports	%	Extra- COMESA imports	%
Product		**Product**	
Manufacture of vegetable and animal oils and fats	21.3	Manufacture of wines	32.3
Manufacture of sugar	18.9	Production, processing and preserving of meat and meat products	14.2
Manufacture of grain mill products	11.1	Manufacture of vegetable and animal oils and fats	10.4
Manufacture of other food products n.e.c.	9.6	Manufacture of other food products n.e.c.	9.6
Processing and preserving of fish and fish product	7.0	Processing and preserving of fruit and vegetables	9.2
Manufacture of malt liquors and malt	5.4	Manufacture of sugar	6.9
Manufacture of cocoa, chocolate and sugar confectionery	5.2	Manufacture of grain mill products	5.7
Manufacture of dairy products	5.0	Processing and preserving of fish and fish product	2.3
Distilling, rectifying and blending of spirits; et	4.1	Manufacture of malt liquors and malt	1.9
Processing and preserving of fruit and vegetables	2.9	Manufacture of soft drinks; production of mineral water	1.5
Manufacture of soft drinks; production of mineral water	2.1	Manufacture of starches and starch products	1.5
Others	7.4	Others	4.6

Source: TRAINS data accessed through WITS

Annex 2: Processed foods analyzed in the study

ISIC rev. 3 Classification	Product Description
1511	Production, processing and preserving of meat and
1512	Processing and preserving of fish and fish product
1513	Processing and preserving of fruit and vegetables
1514	Manufacture of vegetable and animal oils and fats
1520	Manufacture of dairy products
1531	Manufacture of grain mill products
1532	Manufacture of starches and starch products
1533	Manufacture of prepared animal feeds
1541	Manufacture of bakery products
1542	Manufacture of sugar
1543	Manufacture of cocoa, chocolate and sugar confectionery
1544	Manufacture of macaroni, noodles, couscous and similar farinaceous products
1549	Manufacture of other food products n.e.c.
1551	Distilling, rectifying and blending of spirits; etc
1552	Manufacture of wines
1553	Manufacture of malt liquors and malt
1554	Manufacture of soft drinks

Source: COMTRADE database accessed through WITS

Annex 3: Descriptive Statistics of variables

Variable	Number of Observation	Mean	Standard Error	Minimum	Maximum
lnTot	1392	13.30	3.75	1.10	19.76
lnGDPi	3420	22.93	1.55	19.98	26.19
lnGDPj	3420	22.93	1.55	19.98	26.19
lnDij	3420	8.03	0.65	5.62	9.34
lnGDPPCdifij	3420	7.00	1.67	-1.34	9.48
REMi	3420	0.02	0.09	0.00	2.62
REMj	3420	0.01	0.04	0.00	0.83
EXRij	3420	0.10	0.19	0.00	0.83
doc2im	3294	9.04	2.74	5.00	21.00
docs2expo	3294	7.58	1.96	4.00	14.00
INFRi	3420	25.91	23.11	2.43	89.57
INFRj	3420	25.91	23.11	2.43	89.57
Pol_i	3420	-0.67	0.93	-2.66	1.00
Pol_j	3420	-0.67	0.93	-2.66	1.00
COMESAFTA	3420	0.57	0.50	0.00	1.00
RECi	3420	0.50	0.50	0.00	1.00
RECj	3420	0.50	0.50	0.00	1.00
LandLocki	3420	0.42	0.49	0.00	1.00
LandLockj	3420	0.42	0.49	0.00	1.00
Islandi	3420	0.21	0.41	0.00	1.00
Islandj	3420	0.21	0.41	0.00	1.00
ADij	3420	0.12	0.33	0.00	1.00
OffLangij	3420	0.52	0.50	0.00	1.00
EtLangij	3420	0.47	0.50	0.00	1.00
ComColij	3420	0.30	0.46	0.00	1.00

Annex4: Correlation Matrix

	lnTot	lnGDPi	lnGDPj	lnDij	lnGDPP Difij	REMi	REMj	EXRij	COMESA FTA	RECi	RECj	Docs2 imp
lnTot	1.00											
lnGDPi	0.22	1.00										
lnGDPj	0.14	-0.11	1.00									
lnDij	-0.29	0.23	0.27	1.00								
lnGDPPCdifij	0.03	-0.04	-0.03	0.31	1.00							
REMi	0.29	-0.05	0.20	-0.22	-0.12	1.00						
REMj	0.28	-0.18	0.19	-0.32	-0.11	0.28	1.00					
EXRij	-0.07	0.44	-0.03	0.22	0.14	-0.10	-0.09	1.00				
COMESAFTA	0.20	-0.09	0.11	-0.16	0.06	0.03	0.17	-0.11	1.00			
RECi	0.02	-0.23	-0.02	-0.04	0.15	-0.03	0.00	0.06	0.10	1.00		
RECj	0.08	0.02	-0.11	-0.08	0.03	0.16	0.06	0.04	0.12	-0.04	1.00	
doc2im	0.07	0.16	0.01	-0.10	-0.42	0.15	0.06	-0.18	-0.09	-0.28	-0.01	1.00
docs2expo	-0.05	0.04	-0.03	-0.09	-0.37	0.01	-0.01	-0.01	-0.05	0.02	-0.23	0.08
INFRi	-0.03	0.07	-0.04	0.28	0.51	-0.13	-0.10	0.26	0.15	0.13	0.00	-0.48
INFRj	0.14	-0.03	0.10	0.26	0.51	-0.08	0.02	-0.04	0.24	-0.03	-0.03	-0.06
Pol_i	-0.07	-0.43	-0.01	-0.02	0.33	-0.02	-0.02	-0.39	0.17	0.03	-0.05	-0.41
Pol_j	0.03	0.01	-0.44	-0.10	0.32	-0.23	0.03	-0.02	0.19	-0.02	-0.16	-0.03
LandLocki	-0.03	-0.15	0.12	-0.19	-0.36	0.19	0.13	-0.39	-0.10	-0.47	0.00	0.45
LandLockj	-0.14	0.05	-0.15	-0.22	-0.23	-0.17	0.01	-0.02	-0.04	-0.03	-0.49	0.03
Islandi	-0.16	-0.45	-0.04	0.03	0.39	-0.16	-0.06	-0.07	0.09	0.41	-0.02	-0.52
Islandj	0.00	-0.03	-0.41	-0.04	0.37	-0.13	-0.08	-0.05	0.14	0.02	0.26	-0.08
ADij	0.33	0.13	0.14	-0.48	-0.22	0.30	0.23	0.16	-0.08	0.00	0.13	0.13
OffLangij	-0.05	-0.19	-0.25	-0.31	0.08	-0.01	0.05	-0.21	0.01	0.03	-0.08	-0.06
EtLangij	0.23	-0.04	-0.05	-0.16	0.16	0.06	0.11	-0.11	0.48	0.03	0.02	-0.08
ComColij	0.16	-0.09	-0.11	-0.23	0.07	0.02	0.02	-0.10	0.13	0.13	0.05	-0.10

Correlation Matrix (continued)

	Docs2exp	INFRi	INFRj	Pol_i	Pol_j	Landli	LandLj	Islandi	Islandj	ADij	Off Lanij	EtLangij	
Docs2exp	1.00												
INFRi	-0.04	1.00											
INFRj	-0.42	0.00	1.00										
Pol_i	-0.03	0.43	0.04	1.00									
Pol_j	-0.32	0.00	0.46	0.02	1.00								
LandLocki	0.02	-0.52	-0.02	-0.10	-0.04	1.00							
LandLockj	0.34	0.00	-0.39	0.04	0.08	0.06	1.00						
Islandi	-0.04	0.42	0.07	0.55	0.05	-0.63	-0.06	1.00					
Islandj	-0.54	0.05	0.46	0.07	0.52	-0.12	-0.45	0.13	1.00				
ADij	0.05	-0.19	-0.20	-0.22	-0.26	0.16	-0.01	-0.26	-0.22	1.00			
OffLangij	-0.10	0.02	0.01	0.28	0.35	0.11	0.23	0.10	0.16	0.02	1.00		
EtLangij	-0.11	0.24	0.29	0.29	0.35	-0.07	-0.08	0.08	0.20	0.00	0.50	1.00	
ComColij	-0.06	0.00	-0.01	0.17	0.18	0.07	0.08	-0.01	0.04	0.15	0.45	0.36	1.00

Annex 5: Panel Unit root test results for time variant variables

Source: COMTRADE database accessed through WITS	**LLC test**	**Hadri test**
	Null: Unit root	**Null: No unit root**
lnTotij	1.5423(0.9385)	29.013(0.0000)***
lnGDPi	-13.9883 (0.0000)***	75.6824 (0.0000)***
lnGDPj	-13.9883 (0.0000)***	75.6824 (0.0000)***
lnGDPPCdifij	-22.5492 (0.0000)***	39.3978 (0.0000)***
REMi	4.1e+03 (1.000)	1.6542 (0.0490)**
REMj	18.3958 (1.0000)	19.5440 (0.0000)***
EXRij	-15.0889 (0.000)***	68.7191 (0.0000)***
Pol_i	-12.169(0.0000)***	58.2342 (0.0000)***
Pol_j	-12.169(0.0000)***	58.2342 (0.0000)***
INFRi	-20.1094 (0.0000)***	82.6768 (0.0000)***
INFRj	-20.1094 (0.0000)***	82.6768 (0.0000)***