ISSN 2306-7195
SMU

JAD 8 (1) 2018

Journal of Agriculture and Development

Biannual Journal of Institute of Agriculture and Development Studies (IADS)
St. Mary's University

Agriculture is the most important sector in the Ethiopian economy, contributing the lion's share of the GDP. Nearly 80% of the population live in the rural areas and derive their livelihoods directly or indirectly from agriculture. Given its importance, the performance of the sector is therefore reflected in the performance of the whole economy. With this background, the Journal of Agriculture and Development aims to stimulate research and thinking on agriculture and development studies in Ethiopia. The articles contained in the journal reflect the views of their authors and do not necessarily coincide with those of the Editorial Committee, Institute of Agriculture and Development Studies, JADS or of SMU.

Journal of Agriculture and Development

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Journal of Agriculture and Development

JAD 8 (1) 2018 January, 2018

CONTENTS

Agricultural Trade and Regional Integration: The Case of Common Market for Eastern and Southern Africa (COMESA)

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Abstract

Various empirical studies in the past used aggregate trade performance to assess effects of regional integration on agricultural trade. These studies revealed their findings by examining few selected agricultural commodities. Besides, existing evidences on the effectiveness of regional integration in promoting intra-regional agricultural trade in Africa is equally mixed. Thus, a comprehensive study that examines the effect of COMESA regional integration on agricultural trade using disaggregated data remains unexplored. This study investigates the effect of regional integration on agricultural exports for COMESA economies. The research employed an augmented gravity model of bilateral trade for the period covering 1997-2018. The empirical evidence is based on panel data analysis and random effects model estimation. The structure and flow of agricultural commodities trade in COMESA is also analyzed using a descriptive approach. Tea, coffee, spices, vegetables, animal and vegetable fats and oils, cereals, and live animals have emerged as the major exported products accounting for nearly 60 percent share of agricultural exports from COMESA countries to the world. The empirical findings show that real GDP of both exporter and importer countries is a robust predictor of agricultural export trade performance in the region. Other significant factors that positively affected intra-COMESA agricultural exports include population of importing country, common border, and common official language. The estimation results also indicate that intra-COMESA agricultural exports have inverse relation with population size of exporter country, exchange rate devaluation, and distance between bilateral trade partners. The predicted coefficient for exchange rate reveals unexpected negative sign. This result is in contrary to the widely held opinion that currency devaluation generates more exports. Also, the empirical evidences indicate that COMESA regional integration has both trade diversion and trade creation effects on agricultural trade. However, the net effect shows existence of trade diversion, which is a little higher than the trade creation coefficient. To mitigate the trade diversion effect observed in the empirical finding, the study recommends strategic interventions by under taking full implementation of harmonizing trade policies and calling for deeper integration of COMESA. This would be crucial not only to tackle major barriers to trade but also to expand the low level of intra-regional trade in agriculture. Finally, to address the finding related to negative effects of exchange rate devaluations and to promote intra-COMESA agricultural trade, the paper suggests reduction of currency disparities among member states and adoption of common currency regime.

Keywords: *Regional integration; COMESA; free trade areas; agricultural export, gravity model; trade creation; trade diversion.*

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1. INTRODUCTION

Over the past decades, the emergence of regional integrations has transformed the global trading system. Several regions across the world witnessed advancement in the level of regional integrations. Recent studies revealed that about 50 percent of the global trade is now carried-out under the auspices of free trade agreements enforced among member countries in various regional economic blocs (Douglas, 2016). Regional integration has been viewed as a major policy apparatus to ascent the ladder of industrialization and economic growth, and attain better social welfare. This principle, beside other dynamics, has led to the rise of Regional Trade Arrangements (RTAs) all over the world in the past few decades.

There is a long history of Regional Trade Arrangements (RTAs) in Africa, dating back over forty years. Regional integration has been regarded as a tool for promoting economic growth and sustainable development and improving the living standards of the African people. African countries have enforced many different RTAs that differ in their degree of integration, going from free trade areas, to common markets, to customs unions, and finally to monetary unions (Candau et al, 2018). Demographic changes and economic growth are leading to rising demand in African markets, reinforcing the rationale for deepening economic integration across the continent, which is also important for the diversification of production and value addition in Africa. Recent efforts in the African continent give priority to broader continental integration than offered by current Regional Economic Communities (RECs). African governments are multiplying initiatives in support of greater regional integration. The African Continental Free Trade Area (AfCFTA) is a particularly important initiative worth noting here. The AfCFTA agreement aims to create the largest free trade

area in the world with 1.2 billion people in 55 countries and a combined GDP of US$2.5 trillion (Bouet et al, 2019).

COMESA is one of the largest Regional Economic Communities (RECs) in Africa encompassing 21 member states. This regional trading bloc was created in 1994 as a predecessor of Preferential Trade Area for Eastern and Southern Africa (PTA) to help the member states achieve maximum benefits of regional integration. The COMESA regional economic bloc works to attain sustainable economic and social development in all member states capitalizing on greater co-operation and integration in all fields of development. In the COMESA region, 16 of 21 member states are already participating in the established Free Trade Area (FTA). DRC, Eretria, Eswatini, Ethiopia, and Uganda are the five member states that have not so far joined the FTA in the COMESA. While, the COMESA FTA member countries are Burundi, Comoros, Djibouti, Kenya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Zambia, and Zimbabwe, Egypt, Libya, and Tunisia. The FTA offers duty-free and quota-free markets access for goods exported from COMESA member countries (Bouet et al, 2019).

There are varied discourses regarding importance of regional integrations and welfare effects of regional economic blocs in promoting agricultural trade. Whilst, the importance of free trade agreements, numerous debates have also emerged regarding the welfare effects of the regional free trade agreements. One of the key arguments is the presence of low-level of intra-regional trade and trade diversion from member states to non-members. Other views are based on the notion that regional integration have welfare effects through trade creation within member countries and urge for expanding regional integrations. Further claims point that free trade

agreements may hurt small countries and it may benefit large countries in terms of gain on trade. Overall, past and recent findings on the effects of regional integrations on promoting intra-regional trade are mixed and inconclusive.

Several empirical studies, some of which are cited below, were conducted on the effect of regional integration and economic growth across different regional economic communities. However, most of these studies focused on assessing the overall impact of regional integration on economic growth. Also, diverse methodologies were employed to analyze the effects of regional integrations and they came up with mixed results. These studies failed to consider disaggregated data for analyzing the effects of regional integration on trade. Moreover, other studies attempted to determine the impact of regional integrations by investigating only few selected agricultural commodities such as livestock products, wheat, maize and rice. However, a comprehensive study that employs disaggregated data and explores agricultural commodities trade and COMESA regional integration remains unexplored. Therefore, it is imperative to investigate the structure of agricultural commodities trade, determinants of intra-COMESA agricultural exports, and the effect of COMESA regional trade agreement on promoting agricultural exports. This could provide empirical evidences for policy action and further exploration.

For instance, Binyam (2019) analyzed the impact of live animal production and trade on economic growth of COMESA countries. The researcher used a standard panel data model to determine the relationship between livestock and livestock products trade with economic growth in COMESA member countries. The finding of the study indicated the presence of positive correlation between COMESA FTA membership and economic growth as

well as trade in livestock products. Furthermore, Albert (2012) conducted a comparative study on the effect of regional trade agreements on intra-trade in COMESA, EAC, and SADC for three selected agro products (i.e., maize, rice and wheat). The author used a Gravity model and the empirical results for COMESA region showed a positive and significant effect of the intra-regional trade. However, the study results lack conclusiveness as the analysis was based on three commodities only. On the other hand, Tessema (2014) examined the trade effects of COMESA regional trade agreements on aggregate export volume of member countries using a Gravity model. The results of the study showed that the regional economic bloc has significant trade effects on its member countries and urged for expansion in economic integrations. Likewise, Adane (2014) employed a standard Gravity model to assess the effect of regional economic integration in COMESA member states. Unlike the previous studies, the empirical finding revealed that trade diversion is more powerful than trade creation in COMESA.

Despite having a number of recent empirical research contributions, the effect of regional integration on agricultural trade in COMESA regional bloc at disaggregated data level has not been investigated thoroughly. One of the major gaps is that the various empirical studies conducted earlier focused on assessing the effects of regional integration on trade and economic growth by analyzing aggregate trade performance. In addition, these studies examined few agricultural commodities in order to investigate the effect of regional integration. Moreover, past studies employed standard Gravity model using standard variables. However, the standard Gravity equation ignores many other variables that could have either positive or negative effect on bilateral trade, which could result in misspecification

bias. Besides, available evidences on the effectiveness of regional integrations in promoting intra-regional trade in Africa is equally mixed. Thus, a comprehensive study that examines the effects of COMESA regional integration on agricultural trade using disaggregated data remains undocumented. The existence of these research gaps motivated the current study. Therefore, this study empirically investigates the effects of COMESA regional integration on agricultural trade, analyzes the causes of intra-COMESA agricultural trade, and explores the patterns and flow of intra-COMESA's agricultural[3] trade.

RESEARCH METHODOLOGY

Research Design

The study employed a quantitative research design, which primarily used an econometric analysis. A panel data is used to investigate the causes of intra-COMESA agricultural trade and the effect of COMESA FTA on the region's agriculture trade. In addition, a descriptive statistics and trend analysis is conducted to examine the patterns and flow of agricultural commodities trade.

Data Types and Sources

The study used secondary data gathered from various international institutions. Panel data for bilateral trade in agricultural commodities is sourced from the UNCOMTRADE and COMSTAT databases. The panel data covered the period 1997 to 2018 for selected COMESA countries.

[3]The agricultural commodities analyzed in this study are based on Standard International Trade Classification (SITC) system. The products include food and live animals (HS Code 0), beverages and tobacco (HS code 1), animal vegetable oils and fats (HS Code 4), oilseeds and oleaginous fruits (HS Code 22), and hides and skins (HS Code 21). Please refer annex 2 for details of the product groups by HS code at two digits level.

Exporters and importers' real GDP, population, real exchange rate is obtained from IMF, and the World Bank, World Development Indicators (WDI) databases. While, data for bilateral distance, common official language, and common border (adjacency)is derived from CEPII database.

Selection of COMESA Countries for the Purpose of the Study:

The selection followed a non-random sampling based on a set of factors such as trade data availability, geographical location, and size of economy. Thus, seven countries namely Burundi, Ethiopia, Egypt, Eswatini, Kenya, Rwanda, and Sudan were selected for the analysis based on the following criteria. The criteria are trade data availability, geographical location, and economy size.

Data Analysis

The study used both descriptive and inferential econometric analyses to investigate the effect of COMESA regional trade area on agricultural exports of member states. For the econometric analysis, the model is transformed into a log-linear form to estimate the regression equation. Using the log-linear model, one can easily comprehend the slope coefficient, which measures the elasticity of the dependent variable with respect to the independent variable.

Model Specification and Estimation

Gravity Model

The research used augmented gravity model to assess the effect of the COMESA FTA on agricultural commodity exports. The standard gravity equation tends to ignore many other variables that could have either positive

or negative impact on trade volumes between the trading partners, which results to misspecification bias (Vinaye, 2009). To address this problem, the standard approach has been to specify an augmented gravity model by addition of relevant variables to the traditional model, most of which are inspired by theory and motivated by various testable hypotheses (Vinaye, 2009).Based on trade theories and reviews of literatures, the augmented gravity model used in this study takes the following form:

$EXP_{ij} = f(GDP_i, GDP_j, POPi, POP_j, EXRT_{ij}, DIS_{ij}, CL_{ij}, AD_{ij})$……[1]

Wecan rewrite the model equation using a log-linear form:

$$\ln EXP_{ijt} = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_1 \ln(GDP_{it}) + \boldsymbol{\beta}_2 \ln(GDP_{jt}) + \boldsymbol{\beta}_3 \ln(POP_{it}) + \boldsymbol{\beta}_4 \ln(POP_{jt}) + \boldsymbol{\beta}_5 \ln(EXRT_{ijt}) + \boldsymbol{\beta}_6 \ln(DIS_{ij}) + \boldsymbol{\beta}_7 \ln(CL_{ij}) + \boldsymbol{\beta}_8 \ln(AD_{ij}) + \boldsymbol{\beta}_9 \ln(\text{COMESA-one}_{ij}) + \boldsymbol{\beta}_{10} \ln(\text{COMESA-both}_{ij}) + \varepsilon_{ij}$$ ……[2]; where:

i= represents the exporter country; j represents the importer country; and t represents the year; EXP_{ijt}= represents the value of bilateral agricultural export from country i to country j in year t; GDP_{it}= is the GDP level of the exporter country in year t;

GDP_{jt} = is the GDP level of the importer country in year t;

$EXRT_{ijt}$ = is the real exchange rate between the exporting country and that of the importing country;

POP_i= is the population level of the exporter country in year t;

POP_j= is the population level of the importer country in year t;

DIS_{ij}= is the distance between the exporter and importer;

CLA_{ij}= is a dummy for common language (taking value of 1 for common language, and 0 otherwise);

AD_{ij}= is a dummy representing adjacency between any pair of trading partners (taking value of 1 for common border, and 0 otherwise); and

ε_{ijt} = is an error term.

Definition and Measurement of Variables

Based on theoretical and empirical literatures, major variables explaining bilateral trade flow between trading partners are selected. The variable definition, measurement, and justification for use in the empirical analysis is discussed below.

Table 1: Summary of Variables, Definition and Expected Association

S/N	Variables	Variable Description	Expected Association (Sign)
1	Agricultural Exports (EXP_{ijt})	- The annual value of agricultural exports from country i to country j in year t (in US $). o Agricultural commodities in this study are grouped into four major product groups based on SITC system. These include food and live animals, beverages and tobacco, animal vegetable oils and fats, and hides and skins.	- Dependent Variable
2	Gross Domestic Product (GDP_{ij})	- The annual real GDP of a country measured in constant 2010 US dollars.	- Independent variable - Positive association with agricultural exports.
3	Population (POP_{ij})	- Total number of people in a country, measured as the annual estimates in millions.	- Independent variable - Positive association with agricultural exports.
4	Exchange Rate ($EXRT_{ij}$)	- The real exchange rate between the currency of the exporting country and that of the importing country.	- Independent variable - Positive association with agricultural exports.

5	Distance (DIS_{ij})	- The geographical distance between the capital cities of two trading partners measured in kilometers	- Independent variable - Negative correlation with agricultural exports.
6	Common Official Language (CLA_{ij})	- A dummy representing common official language between trading partners (taking value of 1 for common language, and 0 otherwise)	- Independent variable - Positive association with agricultural exports.
7	Adjacency (ADJ_{ij})	- A dummy denoting common border between any pair of trading partners (taking value of 1 for common border, and 0 otherwise)	- Independent variable - Positive association with agricultural exports.
8	COMESA-one_{ij}	- A dummy variable representing COMESA membership. It takes value of 1 if i belongs to COMESA FTA and j does not or vice versa, and zero otherwise.	- Independent variable - Negative association with agricultural exports.
9	COMESA-$both_{ij}$	- A dummy variable representing COMESA membership, takes value of 1 if both i and j belong to the COMESA FTA and zero otherwise.	- Independent variable - Positive association with agricultural exports.

Results and Discussions

Agricultural Trade Performance of COMESA

Figure 1 depicts the percentage share of agricultural trade in GDP for the selected COMESA countries. This ratio is one of the frequently used indicators in international trade to measure trade openness among different economies. According to OECD (2011), tariff and non-tariff barriers to trade, size of economy and distance among trading partners may affect the trade openness ratio. Importantly, a low ratio does not necessarily imply prevalence of barriers to trade in a particular economy. Over the past decade, Eswatini has the highest trade to GDP ratio among the COMESA countries under study. While, the annual average ratio for Sudan is found to be the lowest. This pattern again attests the fact that Eswatin's relatively small sized economy and Sudan's trade embargo that has stricken the nation for decades could have created a diversion in either total trade or GDP, which could possible affect the ratio. Overall, Figure 1 shows trends of the agricultural trade-GDP ratio, which also depicts the volatility trends in agricultural trade.

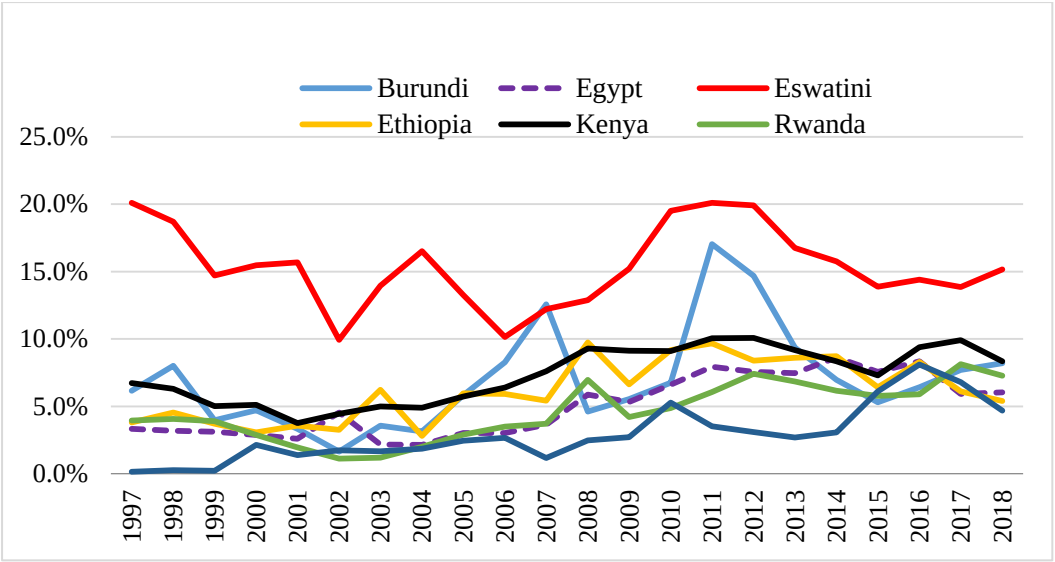

Figure 1. Percentage share of total agricultural trade in GDP in COMESA Countries

Source: Computed by author, data from WDI and COMSTAT

Table2 presents performance of selected COMESA countries' and all member states' total trade and with a dichotomy of agricultural trade situation. The table summarizes total export-import trade and analyses the state of agricultural trade in the regional trading bloc. During 2018, COMESA member states exported and imported total merchandise goods valued at US $110.7 billion and $196.1 billion, respectively. In the same period, these member states registered total agricultural exports and imports worth of US $49.7 billion. Among the COMESA economies, Egypt accounted for the lion's share in world total trade as well as world agricultural commodities trade. The proportion of agricultural commodities trade in the total trade indicates the relative predominance of the economic sector across the member countries. At aggregate level, the agricultural trade embraces 21 percent share in the overall trade from the COMESA region. A further investigation shows that agricultural commodity exports contributed

to 17 percent of the total merchandize exports recorded from all COMESA member states. This share varied between 89 percent for Ethiopia and 16 percent for Egypt among the countries selected in the study. For other countries like Kenya and Sudan, the agricultural commodities export sector accounts for about half of the total trade from both these countries.

Table 2: COMESA Countries' Total Trade Vs Agricultural Trade with the World (In2018, values in million US$)

Country	Total Exports	Total Imports	Total Trade	Ag Exports	Ag Imports	Total Ag Trade	Share of Ag Exports from Total
Burundi	122	793	915	71	123	194	58%
Egypt	27,759	72,478	100,237	4,426	12,888	17,314	16%
Eswatini	1,827	1,823	3,650	475	347	822	26%
Ethiopia	1,279	14,897	16,176	1,134	2,227	3,361	89%
Kenya	5,345	17,375	22,720	2,736	2,418	5,154	51%
Rwanda	740	2,626	3,366	245	494	739	33%
Sudan	3,545	8,851	12,396	1,731	1,899	3,630	49%
Sub-Total	40,617	118,843	159,460	10,818	20,396	31,214	27%
COMESA Total	110,680	196,145	306,825	18,490	31,213	49,703	17%
Share of Selected Countries in COMESA Total	**37%**	**61%**	**52%**	**59%**	**65%**	**63%**	

Source: COMSTAT

Also, if we quantity the trade deficits, COMESA members overall had a total trade deficits of US $80 billion by the end of 2018. Out of this total trade deficit, agricultural commodities trade alone accounted for nearly US $13 billion. The analysis of total and agricultural trade of COMESA economies show that COMESA as a whole as well as all the COMESA countries are net importers as far as the total trade is concerned. However, COMESA is a net exporter in case of agricultural trade. The three biggest

economies of the COMESA Free Trade Area— Egypt, Kenya, and Sudan — have relatively contributed to this trade development, as these countries together account for about half of the share of agricultural exports from COMESA. Egypt is the leading economy contributing the highest share to the total trade as well as agricultural trade in COMESA, followed by Kenya and Sudan. Please see Table 3 for details on share of aggregate trade and agricultural trade for each COMESA country.

Table 3: Share of Selected Countries in Total Trade vs Agricultural Trade(In 2018)

Country	Total Exports	Total Imports	Total Trade	Ag Exports	Ag Imports	Total Ag Trade
Burundi	0.1%	0.4%	0.3%	0.4%	0.4%	0.4%
Egypt	25.1%	37.0%	32.7%	23.9%	41.3%	34.8%
Eswatini	1.7%	0.9%	1.2%	2.6%	1.1%	1.7%
Ethiopia	1.2%	7.6%	5.3%	6.1%	7.1%	6.8%
Kenya	4.8%	8.9%	7.4%	14.8%	7.7%	10.4%
Rwanda	0.7%	1.3%	1.1%	1.3%	1.6%	1.5%
Sudan	3.2%	4.5%	4.0%	9.4%	6.1%	7.3%
Sub-Total	36.7%	60.6%	52.0%	58.5%	65.3%	62.8%
COMESA Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: COMSTAT

Intra-COMESA Agricultural Trade Pattern

In analyzing the effect of regional trading blocs like COMESA, it is highly imperative to examine the level and pattern of intra-regional trade performed within the economic bloc. As the main interest of this paper is agricultural trade, the status of agricultural commodities trade in COMESA is further investigated. Table 4 provides a summary of intra-COMESA

agricultural trade vis-à-vis total agricultural trade with world partners. From the table, one can discern that between the periods2015-2018, COMESA agricultural trade (with world partners) registered a total trade deficit US $16.6 billion. However, during the same period, the intra-COMESA agricultural trade revealed a surplus of US $89.0 million. Furthermore, the annual average share of intra-COMESA agricultural exports in total export trade was 19%. This figure ranged from as little as two percent in Eswatini to as high as 45 percent in Rwanda. Similarly, the share of intra-COMESA agricultural imports from the total COMESA import trade stood at 9%.

As Table 4 below shows, when trade with world partners is considered, COMESA member states are net importers of agricultural commodities. On the other hand, when intra-COMESA agricultural trade is considered, COMESA countries are net exporters. If we further examine, we can observe that COMESA agricultural trade with the rest of the world has grown faster than intra-regional trade within the COMESA economic bloc. COMESA total agricultural exports to the world increased to US $18.8 billion during 2015-2018 from US $4.6 billion in 2000-2002. Over these periods, the total agricultural exports to the world has more than quadrupled. A further analysis reveal that intra-COMESA agricultural exports grew up to US $3.3 billion from US $810 million. Overall, the below results indicate that COMESA countries trade more with the rest of the world than within the member states in the regional bloc.

Table 4: COMESA Agricultural Trade Indicators (Annual Average Value in Million US$)

Description/Year	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2015-2018
Total Ag Exports to World	4,629	6,146	9,595	14,712	17,897	18,865
Total Ag Imports from World	8,821	9,473	16,738	25,784	34,310	35,442
BoT- Total Ag Trade -World	(4,192)	(3,328)	(7,144)	(11,072)	(16,413)	(16,577)
Intra-COMESA Ag Exports	772	945	1,826	3,113	3,477	3,403
Intra-COMESA Ag Imports	810	865	1,610	2,817	3,708	3,314
BoT- Intra-COMESA Ag Trade	(38)	79	216	296	(231)	89
Share of Intra-COMESA Ag Exports	13%	17%	15%	19%	21%	19%
Share of Intra-COMESA Ag Imports	6%	9%	9%	10%	11%	11%

Source: COMSTAT

Empirical Framework

Using a panel data for the period covering 1997-2018, the research attempted to analyze causes of intra-COMESA agricultural trade, and effects of COMESA free trade area in agricultural trade in the COMESA region. The dependent variable is agricultural exports from COMESA member countries with respect to bilateral trading partners. Quantitative explanatory variables in the model include GDP, population, exchange rates, and distance between the trading partners. Other categorical explanatory variables estimated in the model are common official language and common border or adjacency. Furthermore, additional dummy variables (COMESA-one$_{ij}$ and COMESA-both$_{ij}$) that represent status of membership in COMESA free trade area are included in the above equation to measure the effects of COMESA regional trade agreement.

Model Estimation Results

This section presents the estimation results of the regression model (Random Effect) employed in the study. The regression results are obtained by running bilateral trade datasets for the standard gravity variables using STATA 15.0. The model used is in a linear-log form and bilateral agricultural exports (EXP_{ij}) is the dependent variable. While GDP of exporter (GDP_i), GDP of importer (GDP_j), population of exporter (POP_i), population of importer (POP_j), exchange rates between importer and exporter countries ($EXRT_{ij}$), and bilateral distance (DIS_{ij}) are independent variables and their respective coefficient values are interpreted in terms of elasticity or percentage changes. The other explanatory variables entered in a dummy form are adjacency (AD_{ij}), common official language (CLA_{ij}), and COMESA membership ($COMESA\text{-}one_{ij}$ and $COMESA\text{-}both_{ij}$). Interpretations for these dummy variables are in terms of level of trade.

Table 5: Summary of Model Estimation Results

Variables	Variables in Log/Categorical Form	Model Estimation Result (Coefficient)	P-Value
Agricultural Exports	Ln EXP_{ij}	-	-
GDP of Exporter Country	Ln GDP_i	1.926214	0.000
GDP of Importer Country	Ln GDP_j	0.997326	0.000
Population of Exporter Country	Ln POP_i	-0.467465	0.001
Population of Importer Country	Ln POP_j	0.107138	0.255
Exchange Rate	Ln $EXRT_{ij}$	-0.146252	0.000
Distance	Ln DIS_{ij}	-1.149272	0.000
Common Official Language	1.CLA_{ij}	2.143180	0.016
Adjacency	1.AD_{ij}	0.604308	0.000
COMESA-one	1.$COMESAone_{ij}$	-1.493254	0.000
COMESA-both	1.$COMESAboth_{ij}$	1.465459	0.000

Source: Author's regression result using STATA 15.0

The statistical significance and sign of the coefficients or estimated parameters reveals how these variables affect agricultural trade between bilateral trading partners. If a coefficient is statistically significant and if it is positive, the variable it represents has a strong direct relationship with agricultural trade between the economies. If a statistically significant coefficient is negative, the variable it represents has a strong inverse relationship with the bilateral trade, which may impede trade. If a coefficient is statistically insignificant, it shows that the factor it represents has a trivial impact on the bilateral trade. The model estimation attest that, except population of importing country (POP_j),all predictor variables are found to have a statistically significant effect on agricultural export trade. As the"p" values are less than one percent (0.000),the explanatory variables are significant at 1% significance level.

Real GDP: First, the coefficients or parameter estimates of real GDP of exporter (GDP_i) and real GDP of importer (GDP_j) are 1.926214 and 0.9973263, respectively. Both the estimated real GDP coefficients have the expected positive sign, which implies the size of exporter's economy and importer's economy directly affects the size of agricultural commodity exports from COMESA countries. In fact, in our case, the effect of real GDP of the exporting country is higher than that of the import trade partner. All other things held constant, on average, one percent increase in real GDP of exporting country would result in US $1.926increase in value of agricultural trade between the exporting country and its trading partner and vice versa. Likewise, one percent increase in real GDP of importing economy would result in US $0.997 rise in value of export trade flows between exporting country and its trading partner and vice versa.

Population size: Second, the parameter estimates of population size are found to have the expected signs. Here, the coefficients for exporter country (POP_i) and importer country (POP_j) are -0.4674651 and 0.1071382, respectively. The negative sign for the exporting country implies that higher population size unfavorably affects agricultural exports by diverting into domestic market. On average, one percent increase in population size could result in a US $0.467 decrease in the value of agricultural export trade between COMESA countries and vice versa. There are mixed evidences regarding this finding. Population of the exporting country can have uncertain effect on the country's exports. It may provide more labor force leading to more output, hence, more exports. However, it can also provide a ready market for the agricultural products at home, hence, leading to fewer exports (Vinaye, 2009).

Whereas, the coefficient for the importing country is positive but it is found to be statistically insignificant (with a "P" value of 0.255). This could mean that the higher the population size of importer countries, the higher the demand for imported agricultural commodities, all other factors being constant. This empirical result is interesting to discern that in economies with a relatively higher population size, agricultural exports are undesirably affected as exports could be diverted into domestic markets. This is evident in COMESA member countries like Ethiopia where major agricultural exports (such as coffee and oilseeds) fetch a higher price in local markets due to larger domestic demand that creates incentives for diversion of these agro-commodities to domestic consumption.

Real exchange rate: Third, value of real exchange rate between the trading partners would play a significant role in determining the value of agricultural exports in the COMESA region. In this study, real exchange

rate is denoted by the ratio of the value of the exporter's currency to importers' currency in US dollars. Therefore, an increase in the exchange rate indicates devaluation of the exporter's currency relative to the importer's currency. This is believed to generate more export trade as agricultural exports could be relatively inexpensive to foreign trading partners. Hence, exchange rate was expected to have a positive sign. Nevertheless, the estimation results show the exchange rate($EXRT_{ij}$) has an unexpected negative sign (-0.1462526), which is significant at one percent level. This finding may entail further study across individual member states of COMESA.

For member countries like Ethiopia, the above empirical result confirms the ground fact where Ethiopia's currency devaluation could not generate more exports. Following a series of exchange rate devaluations in Ethiopia, its annual exports were in fact sliding down year-on-year over that last five years. Researchers such as Geda (2017) have strongly argued that devaluation does not induce export growth in Ethiopia. The researcher claimed that the fundamental problem for Ethiopia's exports is not a "rise in price" but binding constraints related to "production, supply, and exporting. "In any case, the outcome of the estimated coefficient in our empirical finding suggest that, on average, one percent devaluation in exchange rate between the exporting and importing countries could result in a US $0.146decrease in the value agricultural exports from the COMESA states.

Distance: Fourth, distance between exporting and importing economies play a significant role in influencing bilateral agricultural trade between them. Distance between the capital cities was used as proxy variable to represent costs of trading between the exporter and importer. In most cases, the longer the distances between the trading partners, the higher trading costs. As

expected the parameter estimate for the distance variable (DIS_{ij}) is negative (-1.149272) and it is statistically significant at one percent level. The result again suggest that, one percent increase in the distance between the capital cities of the trading partners will on average decrease the value of agricultural exports from the COMESA region by US $1.149, ceteris paribus.

Adjacency (AD_{ij}): Fifth, the other important explanatory variable is adjacency (AD_{ij}) or common border. It is generally true that economies are expected to have more trade with their neighbors, which share a common border. This could result in lower transaction costs. Therefore, adjacency is expected to have a positive sign. The regression results show that coefficient of adjacency (i.e., 2.14318)is highly significant at one percent level. Hence, having common border between COMESA trading partners could result in an increase in the value of agricultural exports by US $2.143.

Common official language: Sixth, the other dummy variable estimated in the model is common official language (CLA_{ij}). This factor indicates the presence of socio-cultural bonds that could enhance bilateral trade between economies. Presence of a common official language between trading partners is expected to have a positive influence on exports. The estimated coefficient (0.6043086) shows that common official language has positive effects on the intra-COMESA agricultural exports. The coefficient is significant at five percent level. Therefore, the empirical result suggests that COMESA member countries that share common official language could witness an increase in value of agricultural exports byUS $0.604.

Trade Creation vs Trade Diversion: Finally, the results of dummy variables COMESA-$both_{ij}$ and COMESA-one_{ij} would enable us to investigate the

effects of COMESA regional trade agreement on the region's agricultural exports. In other words, these variables of interest would help us understand whether the COMESA regional free trade agreements enhance agricultural exports within member states (i.e., trade creation) or diversion of trade from members to non-members. The estimated model captured agricultural exports of selected COMESA member countries destined to trading partners. The regression estimation result of COMESA-both$_{ij}$ dummy variable has the expected positive sign with a coefficient value of 1.465459, which is highly significant at one percent level. This suggests that the COMESA regional trade area is influential in creating intra-COMESA agricultural trade by 333% more within the regional members than trading with the rest of the world. This further implies that COMESA membership boosts agricultural exports and attests that the trading bloc has a trade creation effect. On the other hand, the estimation result for COMESA-one$_{ij}$ shows the expected negative sign with a coefficient value of -1.493254. The estimation points that the result is highly significant at one percent level. In addition, it indicates the presence of trade diversion from COMESA members to non-members by 345%. This would mean that the COMESA free trade area does not play a significant role in generating extra-COMESA trade. This is evident as the result shows the COMESA free trade area expands trade between members and non-members more than trade within members (i.e., intra-COMESA).

Conclusions

The study examined agricultural commodities trade and effects of regional integration in COMESA. First, the study assessed the structure and flow of agricultural trade in COMESA regional trading bloc. Second, the research empirically investigated the causes of agricultural trade among the

COMESA member countries. Lastly, the paper analyzed the effect of COMESA regional free trade agreement on promoting agricultural exports to member countries.

With regard to the first objective, the study analyzed the structure and direction of agricultural trade in COMESA. Over the study periods, agricultural exports from COMESA economies to the world increased from US $5.5 billion to US $18.5 billion. The proportion of intra-COMESA trade from total COEMSA trade also increased from 8% to 18%. This is mainly explained by the launch of a customs union in 2009. The study revealed that COMESA member states are net importers when both total merchandise trade and agricultural commodities trade are considered. Also, COMESA members overall had a total trade deficits of US $80 billion by the end of 2018. Out of this total trade deficit, agricultural commodities trade alone accounted for nearly US $13 billion. Egypt, Kenya, and Sudan have relatively contributed to this trade development, as these countries to gather account for about half of the total agricultural exports from COMESA. In general, we can conclude that intra-COMESA trade in agriculture remains small, although it showed upward growth pattern. During the study period, the annual average share of intra-COMESA agricultural exports in total export trade was 18%. Most of this intra-trade in agriculture happens largely between states that share a common border. Despite various initiatives launched to advance regional integrations, performance of COMESA, intra-regional trade in agriculture lags behind other similar regional trading areas in Sub-Sahara Africa.

In order to answer the second objective, the study explored the determinants of agricultural trade among the COMESA member countries using an augmented gravity model to estimate the predictor variables. The empirical

findings of the study pointed intra-COMESA agricultural exports were positively influenced by real GDP of exporter and importer countries, population size of importer country, adjacency (common border), and common official language. However, intra-COMESA agricultural exports were found to have an inverse relation with population size of exporter country, exchange rate devaluation, and distance between bilateral trade partners. The results are statistically significant at one percent significance level. Interestingly, the estimation results for exchange rate showed unexpected negative sign. Devaluation of exchange rate is thought to generate more exports since agricultural goods could be relatively cheaper to foreign trading partners. Hence, this finding deviates from the widely held view and it may entail further study by type of agricultural products and across COMESA member states.

Lastly, the third objective of the study was to assess the effect of COMESA regional free trade agreement on the region's agricultural exports. The empirical study investigated key interest variables related to COMESA membership. The empirical findings indicate that COMESA regional integration has both trade diversion and trade creation effects. The trade creation effect in agricultural commodities is expected as the COMESA regional trade agreement has enabled its members of the free trade area to obtain duty free access and removal of tariff barriers. Nevertheless, the trade diversion effect on agricultural exports is found to be a little higher than its trade creation effect. Thus, the net effect shows some degree of diversion of agricultural trade from members to non-members. Based on the empirical findings, it can be concluded that COMESA regional integration has not been instrumental in expanding agricultural exports from the selected countries during the study period. Additionally, it can be said that COMESA

as a regional trading bloc has not utilized its full capacity to enhance intra-COMESA agricultural trade. This could be because of trade policies put in place by individual member countries, differences in implementation stages and economy size of member states.

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