The Implications of the African Continental Free Trade Area on Intra-COMESA Trade

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Abstract

This paper uses trade-based indices and the structured gravity model to examine the potential effects of the African continental free trade area on trade within the COMESA region. Using the trade complementarity index, the study reveals limited trade diverting effects of the AfCFTA on intra-COMESA trade. This might be so because trade within the COMESA region is already liberalized. The overall trade complementarity indexes of most of the countries are below 50% suggesting parallel import – export bilateral trade relations. Similarly, the gravity model shows overall potential significant trade creating effects of the African Continental Free Trade Area in the COMESA region. More so, the study shows pure trade creation effects in terms of exports suggesting an increase in welfare of non-COMESA members. Precisely, a reduction in trade costs, stimulating production and liberalize trade in the framework of the AfCFTA stimulate intra-COMESA trade.

1. Introduction

1.1 Background

The effects of regional trade agreements on economic performance of individual countries is well-nigh inconclusive. Yet the number of these regional trade agreements in the world is growing. On 30th May 2019, the African Continental Free trade Area entered into force, bringing the number of regional trade agreements recognised by the African Union to nine. The AfCFTA is envisaged as the largest free trade area in terms of membership since the birth of the World Trade Organization (Kituyi, 2019). In terms of membership, the AfCFTA comprise of 54 countries, covering over 1.2 billion people, with over 3.4 trillion United States dollars in gross domestic product. The members of the AfCFTA belong to eight pre-existing regional economic communities (RECs) recognised by the African Union. These are the Arab Maghreb Union (UMA), Common Market for Eastern and Southern Africa (COMESA), Community of Sahel-Saharan States (CEN-SAD), East African Community (EAC), Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS), Intergovernmental Authority on Development (IGAD), Southern Africa Development Community (SADC). The AfCFTA is expected to increase intra-Africa trade by approximately 52% in 2022 from the 2010 levels through a 90% reduction in tariffs on merchandise goods and the harmonization of trading rules at a regional and continental level (Mishra, 2018). At the present moment, African countries trade more with the rest of the world than amongst themselves. In 2018, intra-Africa exports stood at 15.86% (Afreximbank, 2018) (UNCTADStat, 2019). This is low compared with North America (30.16%), Asia (59.98%) and Europe (68.71%).

Trade performance in the COMESA region is low in comparison with other regional groupings within Africa. For example, intra-COMESA exports (5.7%) rated lowly between the period 1995 and 2018 which compares unfavourably with SADC (19%), ECOWAS (11%) and EAC (9%). Yet the COMESA region boasts of a high membership (21 countries), population and gross domestic product. In 2018, the region had a population of 557 million and over 750 billion US$ of GDP (COMSTAT, 2019). Despite the low intra-COMESA trade performance, the region trade more with the rest of Africa. Between 1995 and 2018, extra-COMESA African exports and imports averaged 40.8% and 59.47% respectively. Since COMESA countries are trading more with the rest of Africa, the potential implications for the AfCFTA on Intra-COMESA trade requires an empirical examination.

Table 1 presents selected indicators of economic and trade performance for Africa and COMESA. It shows that intra-COMESA trade significantly improved between 2000 and 2018. In 2000, intra-COMESA exports were US$2,211.27 million and this increased to US$12, 439.34 million in 2018. Similarly, intra-COMESA imports rose to US$11,486.60 million in 2018 from US$2,426.37 million in 2000. In the same vein, a similar trend was observed in the African continent. Intra Africa exports were US$13,435.05 million in 2000, with the figure increasing to US$77,312.10 million in 2018. Intra-Africa imports also increased from US$17,409.42 million in 2000 to US$73,641.05 million in 2018.

Table 1: Economic Performance and Regional Integration in Africa and COMESA, Selected Indicators (2000 - 2018)

	Population (Millions)		Intra-Exports US$ million		Intra-Imports US$ million		GDP (US$ billion)	
	2000	*2018*	*2000*	*2018*	*2000*	*2018*	*2000*	*2018*
COMESA	441	557	2211.27	12439.34	2426.37	11486.6	293	750
AFRICA	971	1531	13435.05	77312.10	17409.42	73641.05	740	2770

Source: COMSTAT (2019) and UNCTAD (2019)

The AfCFTA has seven protocols that are on: (a) trade in goods; (b) trade in services; (c) investment, intellectual property rights (d) competition policy; (e) rules and procedures on dispute settlement; (f) investment; and (g) free movement on people (Tralac, 2018). The overarching objectives of the trade in goods protocol are: progressive elimination of tariffs and non-tariff barriers, enhancing the efficiency of customs, trade facilitation and transit, cooperation on technical barriers to trade and sanitary and phytosanitary, development and promotion of regional and continental value chains, socio-economic development, diversification and industrialization across Africa (Tralac, 2018). The trade in goods protocol is negotiated in phase one of the negotiations. In this protocol AfCFTA member states have agreed to liberalize 90 percent of all trade. However, the period for liberalizing the 90 percent of trade depends on the classification of the countries and the nature of the products (UNECA, 2020). Developing countries are expected to fully liberalize over the period of 5 years, least developed countries over 10 years while a group of six[1] is expected to fully liberalize over a 15 year period (UNECA, 2020). The AfCFTA Member states agreed that developing, least developed and a group of six countries should liberalize in 10 years for developing countries and thirteen years for least developed and a group of six countries in the case of sensitive products. No cuts were agreed on excluded products (UNECA, 2020).

The emergence of free trade agreements such as the AfCFTA is not a random phenomenon but rather a part of the 21st century regionalism evolution (Kimura & Chen, 2016). Such agreements are deeper than the standard regional agreements that focuses on trade liberalization and narrowly on merchandise trade. These agreements are instead connected to the 21st century trade that is composed of trade in goods, services, trade in parts and components and freer cross-border movement of factors. Furthermore, they aim for higher standards and quality and require liberalisation beyond the border economic reforms. They work on regulatory coherence in areas that include WTO plus and WTO extra provisions. However, the formation of such a free trade area poses opportunities and threats to already existing RECs. Thus, such RECs need to observe the progress of negotiations in the AfCFTA and follow up on issues to ensure that their levels of integration will not lag behind the progresses made in the mega trade agreement. Notwithstanding, RECs are associated with trade creating and trade diverting effects. In the aspect of innovation, industrialization, competition, investment flows, economies of scale and productivity, there seems to be a consensus that RECs are pro-industrialization and pro-innovation (Hosny, 2013). However, less is known on the implications of continental free trade area agreements on a small set of regional trade agreements. Marinov (2014) associates regional trade agreements with increased investment, expenditure, specialization, production networks, production technology and economic growth.

The impact of mega deals on individual countries and other regional groupings may vary due to their differences in the stages of development, the legal framework and the political systems among others (Kimura & Chen, 2016). This makes the potential effects of the AfCFTA on intra-COMESA trade well-nigh inconclusive. However, two issues are certain in relation to mega deals such as the AfCFTA: 1) the mega free trade area affects both regional and global trade orders; 2) they have deep impact on both member and non-member states of the agreement. Therefore, examining the intra-regional trade effects of the AfCFTA is of relevance in the on-going debate on regionalism.

In light of this background, section 1.2 presents the key objective of the study, while section 2 presents literature review, section 3 discusses the methodology, section 4 presents the results and the associated discussions and section 5 provides conclusions and policy implications.

[1] Include Ethiopia, Madagascar, Malawi, Sudan, Zambia and Zimbabwe

1.2 Objectives of the Study

The main objective of the study is to examine the potential effects of the AfCFTA on Intra-COMESA merchandise trade.

Specifically, the study seeks to

- Determine the complementarity of trade between COMESA and non-COMESA countries.
- Determine the possible trade creating and diverting effects of the AfCFTA on COMESA merchandise trade.

2. Review of Literature

This section is in two parts: (a) the theoretical explanations of the effects of RTA and (b) the methodological literature and (c) empirical findings on the effects of RTA on trade.

2.1 Theoretical Literature

Theoretical literature on the effects of regional effects pre-dates to the 1950s. In a canonical and monumental neo-classical theory on customs union, Viner (1950) opines that the formation of a customs union has the potential of generating trade-diversion and trade-creation effects. Thus, RECs such as free trade agreements are considered as second-best policies. The Vinerian model is a partial equilibrium analysis which argues that a regional trade agreement would be beneficial if only it can balance trade creation and trade diversion effects. In this model, trade creation occurs if regional trade increases through the shifting of production from less efficient, high-cost producers to more efficient, low-cost producers outside the trading bloc. On the other hand, trade diversion occurs when regional trade agreement leads to a shift in production from low cost producers outside the bloc to high-cost producers within the bloc.

In general, trade creation means that a regional trade agreement generates trade that would not have existed otherwise. As a result, supply occurs from a more efficient producer of the product. In all cases, trade creation would raise a country's national welfare by reducing the cost of a product and increasing supply, while trade diversion would reduce national welfare by increasing cost of products. (Duncan, 2015). Trade diversion is welfare reducing because it shifts production from a more efficient production outside the bloc to an inefficient producer inside it. Trade diversion therefore leads to a worsening of the international allocation of resources and shifts the structure of production away from that which is based on comparative advantage. Supposing that economic resources are fully employed before and after the formation of the regional trade arrangement, output increases the welfare of all countries concerned because it leads to more specialization based on comparative advantage. However, the effects of RECs are far from being unambiguous. These effects, in the Vinerian context, depend on the strength of the trade creation and trade diversion effects. However, Mattoo *et al.*, (2017) argues that the Vinerian model was developed for preferential trade agreements and cannot be used for examining the effects of regional trade agreements in deeper trade agreements such as those formed under the General Agreement on Tariffs and Trade Article XXIV. In addition, the Vinerian model is criticised on its failure to incorporate the consumption effects of the regional trade agreement.

Other than the Viner's trade creation and diversion effects, regional trade agreements have three effects. These are the allocation, accumulation and location effects. Firstly, the allocation effects arise in circumstances where regional trade agreements assume perfect competition. Thus, the formation of the free trade area, coupled with a reduction in all forms of barriers leads to a better allocation of resources. Allocation effects are the static effects and relatively short-term effects which are not associated with changes in costs of production and

technological processes. They include the ways in which elimination of trade barriers inside a regional bloc leads to better allocation of resources (Marinov, 2014).

Secondly, RECs are also often associated with accumulation (dynamic) effects. These effects arise on the assumption of imperfect competition. In fact, dynamic effects arise from an enlarged market size, investment levels, competitiveness, economies of scale and other common policies such as regional policies (Kawecka-Wyrzykowska, 2011). Enlarged markets allows producers to take advantage of economies of scale that would not have occurred in smaller markets. Furthermore, larger markets created through integration allows for deeper specialization of production besides enhancing competition among producers in the region. Efficiency will be realized as a result of the increased competition. Subsequently there will be a reduction in the costs of production and better quality of products in the market. Considering regional integration, dynamic effects are considered more important than static effects despite being difficult to measure (Kawecka-Wyrzykowska, 2011) .
Thirdly, regional trade integration is associated with location effects. Location effects are associated with the potential effects of regional integration which intensifies or reduces inequalities between countries or whether integration blocs create new inequalities. If there are new inequalities arising, then regional integration is said to have agglomeration effects (Kawecka-Wyrzykowska, 2011).

2.2 Methodological Literature

Plummer *et al.*, (2010) documents various approaches that can be used to examine the effects of regional trade agreements. The appropriate methods of analysing the effects of the continental free trade area are categorised into the ex-ante and ex-post methodologies. The ex-ante approaches are used to determine the potential effects of a regional trade agreement before it is implemented whilst the ex-post approaches are used to examine the actual effects of the regional trade agreement after it has entered into force. Ex ante approaches basically work with simulations. The approaches used under ex-ante methodologies include trade indicators, partial models such as the SMART model and the computable general equilibrium (CGE) models. Trade indicators are the simplest measures used in simulating the effects of free trade areas (see Section 3.1). Partial equilibrium models analyse the effects of a free trade area on a single market. CGE models are used to examine the economy wide effects of regional trade agreements, however, the use of these models is constrained by complex data requirements. In most cases, potential effects of trade policies are examined using ex-ante methodologies. Such methodologies include the Computable Generalized Equilibrium models, Software for Market Analysis and Restrictions on Trade (SMART) models and Global Trade Analysis Project (GTAP) framework. However, the use of these models is undermined by their specification complexities and weak data availability (Greenaway & Milner, 2002), most particularly in the context of Africa.

2.3 Empirical Literature

Numerous studies have been conducted to examine the potential and actual effects of regional trade agreements in Africa. Geda and Seid (2015) questioned the potential effects of advancing regional economic integration on intra-africa trade. Simulation results from the gravity model estimated using the pseudo poisson maxumum likelihood technique reveals that intra-Africa trade increases through the formation of regional trade agreements. Notwithstanding, the authors argue that weak infrastructure and poor trade facilitation policies can undermine the potential growth in intra-African trade. Similarly, Robinson and Thierfelder, (2002) surveyed the empirical literature using multi-country computable general equilibrium models to analyze potential and actual regional trade agreements. These studies indicate that RTA's improve welfare. In essence, Robinson and Thierfelder, (2002) notes that trade creation is greater than trade diversion implying welfare improvement and the prospect of

more benefits associated with further liberalization. In the same vein, Hallaert, (2007) using a computable general equilibrium models, evaluates the impact of the Southern African Development Community (SADC) free trade area on the economy of Madagascar. The results indicate that, for Madagascar, the benefits of the SADC FTA are minimal. To be specific, the study indicates that SADC FTA is associated with 6 percent of Madagascar's total imports. As such the effects on real gross domestic product is minimal. However, gains are likely to be noticed in the textiles and clothing sectors if the liberalization is complemented with the elimination of rigidities in the labour and capital markets.

Yeats, (1999) analysed the determinants of trade flow and intra-regional trade potential in Sub-Saharan Africa besides the concentration of intra-regional trade. The results show that cross border trade accounts for a greater share of intra-regional trade. Distance also appears to be a factor behind the concentration of bilateral trade between countries in the continent. Yeats' study also shows that there exists high level of sub-regional concentration of intra-Africa trade, with countries in Eastern Africa trading little with West African countries.

Besides the sub-regional concentration of intra-regional trade, most African countries' import manufactured goods and export agricultural raw materials and fuels. The development structure of countries that export is similar to that of the imports of other countries in the continent. Yeats (1999) further argued that actual intra-regional trade in Sub-Saharan Africa is more than its potential provided the existence of trade barriers, poor infrastructure and low complementarity of countries' tradable goods.

Foroutan and Pritchett, (1993) applied the traditional gravity model to analyse the trade potential of Sub-Saharan Africa. Foroutan and Pritchett's findings indicate that the actual intra-trade is higher than the potential intra-trade as the estimated result from the gravity model reveals. The share of SSA's imports plus exports was an average of 8.1 per cent while the gravity model predicts a slightly lower mean of 7.5 per cent. In line with the gravity model, the trade intensity index indicates that African intra-trade is somewhat higher than what should be expected.

Cassim, (2001) examined fundamental factors to ascertain the scope and success of any regional integration initiatives with particular emphasis on SADC. The study provides estimates of trade potential of the sub-region and contrasts the actual intra-regional trade employing the gravity model. The study revealed that fundamental structural and economic factors which include transaction costs of trading partners; the growth paths of member economies as well as changes in gross domestic product per capita income are key factors behind the success of regional integration scheme rather than the trade policies. The study also confirms that the economic and geographical size of trading partners have a significant impact on trade flows. A review of the study implies that the envisaged AfCFTA can benefit by focusing on the fundamental structural and economic factors to stimulate regional integration. Chauvin *et al.*, (2016) using the computable general equilibrium model examined the likely effects of the CFTA in six African countries. The results indicate that the effect of the implementation of the CFTA will depend on the modalities of trade liberalisation. Importantly, they also establish the asymmetric efffects on trade patterns among African countries and within countries across sectors. Njinkeu and Fosso, (2006) analysed intra-regional trade and regional integration in a selected regional grouping focusing on measures and modalities of promoting trade and development. The results managed to eastablish a significant increase in intra-regional tade and thus recommends measures to enhance this trade such as attracting high levels of investment to boost production and subsequently trade.

More related to this study, Geda and Yimer, (2019) estimated the potential trade creating and trade diverting effects of the AfCFTA. Using a gravity model with data spanning 1993-2017,

the study indicates net trade creating effects. In particular, the study asserts that the AfCFTA will lead to a 19% increase in intra-African trade.

Outside Africa, Jayasinghe & Sarker, (2007) find the North America Free Trade Area to be associated with trade creation effects during the period 1985 – 2000. Using an extended gravity model for a panel of six selected agri-food products, the study revealed that the share of intra-NAFTA trade grew and displaced trade with the rest of the world.

3. Methodology

In an attempt to establish the potential effects of the continental free trade area, a number of methodologies have been used. As reviewed in literature, this section discusses the model to be estimated, the appropriate techniques employed and the potential issues associated with the choice of the model. First, the section begins by discussing the trade indicators that are used in determining the trade potential. This is then followed by the Gravity Model formulation used also to simulate on the potential of the formation of the continental free trade area.

3.1 The potential effects of the CFTA: The Trade Indicators Analysis

This section discusses the trade indicators that are used to discuss the potential effects of the formation of the continental free trade area. Trade indicators are defined as indices or ratios used to describe and assess the state of trade flows and the structure of an economy (Plummer *et al.*, 2010). The indicators are important in evaluating the potential benefits of joining a free trade area or not. The idea behind this is that the gains or losses accruing from the formation of a free trade area will depend on the structure and existing trade links among member states (Plummer *et al.*, 2010). This study uses the trade complementarity index to examine the potential effects of the African Continental Free trade Area on intra-COMESA trade.

3.1.1 Trade Complementarity Index

According to Plummer *et al.*, (2010) this index measures the degree to which the export pattern matches the import pattern of a region. It is defined as one minus the sum of the absolute value of the difference between the import category of shares of the region and the export share of the country divided in half. The index is calculated as follows;

$$TCI = 1 - \left\{ \frac{\sum_{g} abs\left[\left(M_{rg} / M_{r} \right) - \left(X_{cg} / X_{c} \right) \right]}{2} \right\}$$

Where $M_{rg} =$ imports of good g by region r, $M_r =$ total imports of region r, $X_{cg} =$ exports of good g by country C. $X_C =$ total exports by country C. The value of the trade complementarity index ranges between 0 and 1. The index of 0 indicates no overlap and 1 indicates a perfect match in the import-export pattern. A high degree of complementarity may indicate more favourable prospects for a successful trade agreement.

3.2 The Gravity Model Potential Effects of the African Continental Free Trade Area

This section complements the trade indicators analysis by providing an econometric analysis on the implications of the AfCFTA on intra-COMESA trade. Cognisant of this fact, ex post methodologies are used which include the gravity models. The following section discusses the gravity model.

3.2.1 Estimation Model: The Gravity Model

Following Geda and Yimer, (2019), the potential effect of the AfCFTA on intra-COMESA trade can be analysed using the gravity model. The gravity model is an essential model in explaining bilateral trade and potential trade outcomes on the basis of its robustness and stability (Paulus *et al.*, 2014). The gravity model in international trade tries to explain trade between countries with the help of the proportion of the countries' gross domestic product and their proximity. The gravity model adopted in this study is that of Anderson and van Wincoop, (2003) which is specified as follows;

$$X_{ijt} = \frac{Y_{it} * Y_{jt}}{Y_t} * \left(\frac{t_{ijt}}{\pi_{it} * P_{jt}} \right)^{1-\sigma} \quad (1)$$

Equation 1 can also be written without changing the meaning as follows;

$$X_{ijt} = \frac{Y_{it} * Y_{jt}}{Y_t} * \left(\frac{\pi_{it} * P_{jt}}{t_{ijt}} \right)^{\sigma-1} \quad (2)$$

X_{ij} is the total monetary value of the trade flow with i representing the recipient while j denotes the partner country. Y represents GDP for the different countries. $\pi_{it} * P_{jt}$ represents multilateral resistance and refers to the effects of market access. This takes a lower value if the country is remote from the world. t_{ijt} are the bilateral trade costs describing the costs of importing from country i by country j. σ is defined as the elasticity of substitution. Trade costs are a function of distance and other dummy variables which can indicate whether a country is landlocked or whether the countries in question share a common border. Trade costs are assumed to be an increasing function of distance and the landlocked status of a country. Embedded in trade costs are information costs and the information variables in the perspective of a gravity model are whether the trading countries have a common language or some other cultural aspects.

Thus, the model to be estimated in this study is specified as follows:

$$\ln M_{ijt} = \alpha_0 + \alpha_1 \ln GDP_{it} + \alpha_2 \ln GDP_{jt} + \alpha_3 \ln Pop_{it} + \alpha_4 \ln Pop_{jt} + \beta \sum t_{ij} + \mu_{it} \quad (3)$$

Where M_{ijt} is the value of imports of country i from country j in period t. The expanded econometric log-linear form of equation (4) becomes:

$$\begin{aligned} \ln M_{ijt} = {} & \alpha_0 + \alpha_1 \ln GDP_{it} + \alpha_2 \ln GDP_{jt} + \alpha_3 \ln Pop_{it} + \alpha_4 \ln Pop_{jt} + \beta_1 \ln Dist_{ij} \\ & + \beta_2 border_{ij} + \beta_3 lang_{ij} + \beta_4 comesa_{intra} + \beta_5 comesa_{imp} + \beta_6 comesa_{exp} + \mu_{it} \end{aligned} \quad (4)$$

GDP_{it} and GDP_{jt} represents the gross domestic product for the reporting and partner countries respectively. $Dist$ is the distance between the major cities of the trading countries and $border$ is the dummy variable with value 1 if countries share a border and 0, otherwise.

$lang$ is a dummy with value equals to 1 if countries share the same official language and 0, otherwise. $comesa_{intra}$ takes the value of 1 if both reporter and partner are COMESA members. $comesa_{imp}$ is a dummy variable with a value of 1 if the importing country is a member of COMESA whilst the exporting country belongs to the rest of Africa and 0 otherwise and $comesa_{exp}$ is a dummy taking the value of 1 if the exporting country is a COMESA member while the importing country belongs to the rest of Africa and 0 otherwise (see Table A1). To correctly conclude the effects of the African continental free trade area on intra-COMESA trade, an examination of the signs of the coefficients β_4, β_5 and β_6 is necessary. if $\beta_4 > 0$ and is corresponded by a lower propensity to import from the rest of Africa $(\beta_5 < 0)$, then trade diversion ensues (Carrere, 2006). In that case, negotiating a trade agreement has undesirable effects. More so, if the increase in intra-COMESA is offset by a decrease in COMESA imports from the rest of Africa, then the regional trade agreement will have pure trade diversion effects. Again, if intra-COMESA increases more than the imports from the rest of Africa decrease, there is both trade creation and trade diversion. According to Geda & Yimer (2019), the net effect is the difference between the coefficients corresponding to the two variables. If $\beta_4 > 0$ and $\beta_5 \geq 0$, then the formation of the AfCFTA will have pure trade creation effects. Lastly, comparing the coefficients β_4 and β_6 culminates into making inferences about the welfare of non-COMESA members. If $\beta_4 > 0$ and $\beta_6 < 0$, this entails export diversion implying a decrease in the welfare of non-COMESA countries.

Data Type and Sources

The study used annual data spanning 2000 – 2018 to determine the potential effects of the AfCFTA on trade within the COMESA region. Trade data for exports and imports used in the study was drawn from UN Comtrade database. Traditional variables gravity data was drawn from the CEPII database. Population and gross domestic data (GDP) were sourced from the World Bank's World Development Indicators (see Table A1). Table A2 presents a list of countries used in the study.

3.3 Estimation Technique

The gravity model is usually estimated using a number of techniques including ordinary least squares, fixed effects, random effects and Poisson Pseudo Maximum Likelihood (PPML) estimators. In this study, equation 4 is estimated using the PPMLHDFE (the poisson pseudo maximum likelihood estimator with multi-way fixed effects) estimator. The choice of the technique is motivated by the robustness of the results obtained under heteroscedasticity. In addition, the model deals with the problem of zero trade flows and yield super-consistent results when fixed effects are incorporated. The coefficients entering the regression model are treated as elasticities for a log linearized model and as semi-elasticities for a model estimated in levels.

4. Results and Discussions

The results from trade indicators and simulation following the gravity model estimation and their discussion are presented in this section. Firstly, a discussion of the descriptive statistics is provided, followed by the presentation and discussion of the trade complementarity indexes results. Lastly, the results of the gravity model are presented and discussed with inferences provided on the potential effects of the AfCFTA on trade in COMESA.

4.1 Descriptive Statistics

The descriptive statistics of the variables are presented in Table 2. It shows that bilateral imports between selected African countries (see Table A2) averaged US$ 26,400 thousand. More so, this variable has the largest variability which shows a high heterogeneity in trade performance of African countries in the sample.

Table 2: Summary Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
imports	31238	26400.6	194000	0	5130000
lngdp_importer	31238	9.379	1.51	6.303	12.939
lngdp_partner	31238	9.035	1.683	4.28	13.251
lnpop_importer	31238	16.24	1.531	11.304	19.093
lnpop_partner	31238	15.83	1.634	11.304	19.093
lndist	31238	8.071	.637	5.089	9.187
border	31238	.072	.258	0	1
lang	31238	.469	.499	0	1
comesaintra	31238	.218	.413	0	1
comesaimp	31238	.325	.468	0	1
comesaexp	31238	.193	.395	0	1

4.2 Trade-Based Indicators: Trade Complementarity Index

Using the trade-based indices, the implications of the AfCFTA on intra-COMESA trade are presented in Table 3. The trade complementary indices for all products between selected COMESA countries and other countries in the region are very low. This indicates that African countries trade less with each other. By intuition, the formation of the AfCFTA will not have a significant effect on intra-COMESA trade.

Table 3 shows that the complementary indexes of selected COMESA countries and other key African countries are less than 1. Most of the indexes are below 0.5, giving weak overall complementarity. Based on the overall trade complementarity indexes presented in Table 3, only a few combinations of countries have a trade complementarity index exceeding 0.5. these are Zimbabwe – South Africa (0.6), Senegal – Mauritius (0.51) and Cote d'Ivoire – Mauritius (0.54). Regarding Zimbabwe – South Africa, these countries are both members of the Southern Africa Development Community, share a common border and are natural trading partners. Therefore, the AfCFTA is expected not to have any significant effect on the already existing trade relationship existing between Zimbabwe and other COMESA countries. A possible trade diverting effect will follow as Mauritius and Senegal and Mauritius and Cote d'Ivoire are expected to increase trade.

For the majority of the countries in the sample, the export (import) pattern of COMESA countries does not match the import (export) pattern of the selected non-COMESA African countries. That being said, the effects of the AFCTA on intra-COMESA is expected to be insignificant.

Table 3: The complementary indexes of selected COMESA and Non-COMESA African Countries -2018

		COMESA Countries						
		Burundi	Kenya	Zambia	Zimbabwe	Egypt	Uganda	Mauritius
non-COMESA Countries	Angola	0.1	0.15	0.15	0.16	0.09	0.19	0.14
	Botswana	0.02	0.13	0.08	0.01	0.43	0.14	0.02
	Ghana	0.02	0.29	0.33	0.04	0.12	0.01	0.13
	Morocco	0.29	0.09	0.16	0.4	0.34	0.04	0.23
	Namibia	0.05	0.3	0.49	0.19	0.45	0.01	0.08
	South Africa	0.44	0.34	0.36	0.6	0.04	0.34	0.3
	Tanzania	0.43	0	0.13	0.43	0.1	0.2	0.1
	Nigeria	0.22	0.47	0.38	0.06	0.38	0.36	0.01
	Cote d'Ivoire	0.43	0.32	0.17	0.45	0.14	0.24	0.54
	Mozambique	0	0.24	0.25	0.11	0.11	0.2	0.19
	Senegal	0.39	0.27	0.26	0.37	0	0.14	0.51

Source: Author Calculations using UN Comtrade Data

4.3 Gravity Model Results

The potential effects of the AfCFTA are determined from the results presented in Table 4. In column 1, most of the gravity model variable coefficients are found to be statistically significant in this model. Both, the coefficients of GDP for the importer and partner countries are found to be positive and statistically significant at the one percent level. A one percent increase in importer and partner GDP result to a 0.35 and 0.52 respective percentage increase in imports. With respect to trade costs, proxied by distance, the coefficient of distance is found to be negative and statistically significant implying the negative effect of transport costs on trade. Particularly, a one percent increase trade costs leads to a 1.62 percent decrease in imports.

For the dummy variable indicating common language, the results show that countries that do have a common language trade more with each other than the others. The results are significant in both column 1 and 2. From the results presented in column 1, having a common language increases the probability of trade 0.46. Column 2 controls for multilateral resistance by including partner and importer effects. However, the magnitude of the effect of having a common language on trade does not change much. Specifically, even after controlling for multilateral resistance, having a common language increase trade by 0.45 percent.

Table 4: Effects of the African Continental Free Trade Area on Intra-COMESA Trade

	PPMLHDFE (1)	PPMLHDFE_FE (2)
ln importer gdp	0.348*	
	(3.91)	
ln partner gdp	0.523*	
	(2.87)	
ln importer population	-0.192	
	(-0.24)	
ln partner population	0.548	
	(0.56)	
ln distance	-1.617*	-1.641*
	(-9.24)	(-9.57)
border	0.463	0.463
	(1.49)	(1.54)
lang	0.456*	0.453*
	(2.60)	(2.60)
$COMESA_{intra}$	2.326*	2.416*
	(4.96)	(5.18)
$COMESA_{Imp}$	-1.710*	-1.701*
	(-2.64)	(-2.58)
$COMESA_{Exp}$	2.500*	2.571*
	(3.02)	(3.08)
Constant	7.973	24.27*
	(0.34)	(17.52)
Observations	31238	28943
Pseudo R^2	0.853	0.883

t statistics in parentheses
$^{+}$ $p < 0.05$, * $p < 0.01$
Notes: the dependent variable for the regression is imports

The results suggest a significant intra-COMESA trade (Geda & Yimer, 2019). In the case of the COMESA agreement, the model find a positive and statistically significant coefficient of 2.326, indicating the possibility of trade creation. In the case, where only the reporter is a COMESA member, the possibility of trade diversion is found to prevail, with a corresponding coefficient of -1.710. The net trade creating effect of setting the AfCFTA in COMESA is 0.616. this indicates that the AfCFTA has the potential of increasing intra-COMESA trade by 61.6 per cent. While controlling the effects of multilateral resistance, the AfCFTA has a net trade creating effect of 0.715. this mean that the AfCFTA has the potential of increasing intra-COMESA trade by 71.5%.

Unlike the Geda & Yimer, (2019) study, this study finds the potential of pure trade creation of exports in the COMESA region. As in Carrere (2006), the study shows that the formation of the AfCFTA has the potential of increasing extra-COMESA exports 4.8 times. This shows that the formation of the AfCFTA has the potential of increasing exports towards the rest of Africa for COMESA countries. Intuitively, this may be possible if the elasticity of demand and supply of products originating from COMESA countries exceeds one. In the same vein, the study finds trade diversion in terms of imports. This suggests that the entering into force of the AfCFTA has the potential of diverting imports from the COMESA region to the rest of Africa. Overall, the formation of the AfCFTA has the potential of boosting intra-COMESA trade. These results are robust even using the PPML estimator with fixed effects.

5. Conclusions and Policy Implications

5.1 Conclusions

This study assessed the potential effects of the African Continental Free Trade Area (AfCFTA) on intra-COMESA merchandise trade using the trade indices-based analysis and gravity-based models. Using a sample of 35 reporting and 48 partner countries for the period 2000 – 2018, this study shows the presence of potential trade creation and trade diversion effects of the AfCFTA.

The results indicate that the signing of the African continental free trade area will lead to pure trade creation for exports and trade diversion of imports. Overall, the implementation of the free trade agreement generate trade creating effects for the COMESA regional trade agreement. The AfCFTA has also positive implication for intra-COMESA trade. However, these findings assume that the Marshal-Lerner conditions holds for the products originating from COMESA countries. That is, the study makes a strong assumption that the sum of the elasticities of demand and supply of products originating from COMESA countries exceeds 1 for tariff liberalization to generate overall net trade creating effects.

5.2 Policy Implications

The above findings lead to many policy implications. Since only 16 out of 21 COMESA member states are participating in the free trade area, the AfCFTA has the implication of widening this zone to include the other 5 COMESA countries which will lead to more intra-COMESA trade and expanded market. More so, the potential effects of the AfCFTA suggest that COMESA countries need to fully integrate into the African continental Free trade area as this has the capacity of boosting exports.

In addition to tariff reductions in the AfCFTA, COMESA countries should put in place infrastructure that reduces trading costs to facilitate trade. For instance, the one stop border posts being implemented should be extended to other COMESA and non-COMESA countries for the region to enrich its trade and extra-exports. In cases where countries do not share common language, COMESA countries should lead in the negotiations of harmonizing trade documents and procedures as this will promote trade. In addition, call centres catering for all languages should be in place to limit the effect of language as a barrier to trade. This will help boost extra-COMESA exports.

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Appendix

Table A1: Variable Definition and Sources

Variable Name	Definition	Source
M_{ijt}	Total bilateral imports of country i from country j in period t. This variable is measured in current US$ (thousands).	COMTRADE
$\ln GDP_{it}; \ln GDP_{jt}$	This is the natural logarithmic value of the total gross domestic product of the importing and exporting countries in time t respectively. This variable is measured in current US$ (millions)	World Bank
$\ln Pop_{it}; \ln Pop_{jt}$	This is the natural logarithms of the total population of the importing and exporting countries in time t respectively. This variable is measured in millions	World Development Indicators
$\ln Dist_{ij}$	Distance between the main cities of the importing and exporting countries. This variable is measured in kilometres.	CEPII
border	This is a dummy variable which measures if countries share a common border. The variable takes the value 1 if countries share a border and 0 otherwise	CEPII
lang	Is a dummy with value equals to 1 if countries share the same official language and 0	CEPII
$comesa_{\text{int}ra}$	Takes the value of 1 if both reporter and partner are COMESA members	
$comesa_{imp}$	This is a dummy variable with a value of 1 if the importing country is a member of COMESA whilst the exporting country belongs to the rest of Africa and 0 otherwise	
$comesa_{\text{exp}}$	Is a dummy taking the value of 1 if the exporting country is a COMESA member while the importing country belongs to the rest of Africa and 0 otherwise	

Table A2: List of Countries in the Sample

Reporting Countries		Partner Countries	
Angola	Lesotho	Angola	Lesotho
Botswana	Nigeria	Botswana	Nigeria
Burkina Faso	Senegal	Burkina Faso	Senegal
Burundi	Seychelles	Burundi	Seychelles
Djibouti	South Africa	Cape Verde	South Africa
Eritrea	Eswatini	Comoros	Eswatini
Democratic Republic of Congo	Tanzania	Democratic Republic of Congo	Tanzania
Cote d'Ivoire	Uganda	Cote d'Ivoire	Uganda
Egypt	Zambia	Egypt	Zambia
Ethiopia	Zimbabwe	Ethiopia	Zimbabwe
Gambia	Rwanda	Gambia	Congo Republic
Ghana	Libya	Ghana	Chad
Cameroon	Malawi	Cameroon	Algeria
Kenya	Somalia	Kenya	Central Africa Republic
Madagascar	Tunisia	Madagascar	Djibouti
Mauritius	Algeria	Mauritius	Equatorial Guinea
Morocco		Morocco	Eritrea
Mozambique		Mozambique	Gabon
Namibia		Namibia	Guinea-Bissau
		Liberia	Libya
		Malawi	Mali
		Mauritania	Niger
		Rwanda	Sao Tome and Principe
		Sierra Leone	Somalia
		Togo	