The Impact of Size of the Regional Economic Blocs to the Country's Flows of Trade: Evidence from COMESA, EAC and Tanzania

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Abstract—This paper attempted to assess whether the size of the regional economic bloc has an impact to the flow of trade to a particular country. Two different sized blocs (COMESA and EAC) and one country (Tanzania) have been used as the point of references. Using the results from of the analyses, the paper also was anticipated to establish whether it was rational for Tanzania to withdraw its membership from COMESA (the larger bloc) to join EAC (the small one). Gravity model has been used to estimate the relationship between the variables, from which the bilateral trade flows between Tanzania and the eighteen member countries of the two blocs (COMESA and EAC) was employed for the time between 2000 and 2013. In the model, the dummy variable for regional bloc (bloc) at which the Tanzania trade partner countries belong are also added to the model to understand which trade bloc exhibit higher trade flow with Tanzania. From the findings, it was noted that over the period of study (2000-2013) Tanzania acknowledged more than 257% of trade volume in EAC than in COMESA. Conclusive, it was noted that the flow of trade is explained by many other variables apart from the size of regional bloc; and that the size by itself offer insufficient evidence in causality relationship. The paper therefore remain neutral on such staggered switching decision since more analyses are required to establish the country's trade flow, especially when if it had been in multiple membership of COMESA and EAC.

Keywords—Economic Bloc, Flow of Trade, Size of Bloc, Switching.

I. INTRODUCTION

SINCE the rise of trade theories in 16th century the world has experienced rapid growth of both regional and international flow of goods, services, capital as well as people in form of human capital. Data indicate that the world merchandise exports are increasing at an average of 6% annually with capital flows as the percentage of GDP in only developing countries increased from 0.1% in 1980 to 1.5% 2010 [22]. According to [21] the world experience about 3% of its population migrating across different countries in search for job. This has been attributed by number of economic strategies which are tracked by different countries to unlock the potentials of trade. For instance, several nations have opted to substantially reduce some of the barriers to trade in form of both tariffs and non-tariff contexts. This can easily be justified by an increase of members of World Trade Organization (WTO) who actually vow to undertake several trade commitments to facilitate growth of multilateral trade system. As in 2015, the organization has 161 members as opposed to

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121 which initiated General Agreement on Tariffs and Trade (GATT) in 1994 [23]. In regional-wise, while the debate is still eminent as to whether creation of regional economic integrations is detrimental to the realization of WTO core objective of trade liberalization, countries have exceedingly continued to ally in order to tap the returns from open trade. Data show that, as by 2014 there were more than 130 regional blocs worldwide compared to 70 in 1990 [23]. While there is a concrete divide between scholars on the role of regional economic integrations on facilitation of trade flows amongst member and non-member countries (see [1], [3]-[5], [7]-[11], [13]-[15], [17], [19]) theories on other hand remain clear that regional blocs reduce costs of transactions to the former group and otherwise to later one. It is from this stand of the theories from which the World has realized formations of new regional blocs and figure of countries becoming members of the existing group increases over time.

Surprisingly, despite the growing interest to ally from the World economies, some countries in have withdrawn the memberships from their ex-affiliated blocs. Some of countries which have happened to withdraw their memberships include Rwanda (ECCAS-2007), Mauritania (ECOWAS-2002) and Mozambique (COMESA-1997). Most of the withdrawal countries have either ended up attached to fewer numbers of groups or joining other blocs. If regional blocs certainly pose significantly impact to the flow of trade between member countries, these switching decisions pursued by some nations remain ambiguous considering both the hypotheses of theories and characteristics of blocs abandoned versus those they join. According to the widely used trade model, gravity model by [25] as cited by [12], the flow of trade between countries is the function of sizes and population of the trading partners as well as distance between them as the main causes. The model establishes that the larger the economy of the trading partners the higher the flow of trade. However, unlike this proven assumption of gravity model, still some countries have opted to swap larger regional blocs for relatively smaller one. With the reference to Tanzania and the two trading blocs (Common Market for Eastern and Southern Africa-COMESA and East African Community-EAC), this paper has therefore attempted to examine the impact of this sort of switching framework on the flow of trade.

A. Tanzania and Its Switching Phenomenon

Like other countries mentioned before, in 2000 Tanzania withdrew its membership from COMESA to co-form new bloc

(EAC) with neighbor countries of Kenya and Uganda; and later Rwanda and Burundi. This decision raised questions, not only because of the formation of the new economic alliance but also its basis to weigh trade benefits from two blocs, COMESA and EAC, particularly when considering the size differences between the two groups [6]. COMESA which started in 1982 as Preferential Trade Area (PTA) is the largest African economic bloc which comprises of 19 member countries with a total population of 469 million people and GDP of USD 588billion [16]. This by far outweighs EAC whose GDP stands at USD 98 billion and population of 149 million people [16]. Following the contemplation of the gravity model about the impact of economic sizes on the flow of trade, Tanzania's switching decision immensely indistinct. The main concern is whether the country had strategic plans to back up its decision to withdraw from the former and co-found the latter. Statistics show that, while it is fourteen years now since the decision was made, Tanzania still realizes rising trade export values in COMESA region. In 2007/2008, for instance, its share of export in such market went up from 6.5% to 8.3%. The situation becomes acutely complicated since while its export figures in EAC have also gone up from USD 180 million to USD 310 million in 2007/2008, it recorded the trade balance deficit of about USD 41.6 million in 2008 compared to surplus of about USD 39.6 million in 2007 [17]. With the figures seem to provide complicated means of comparison; this paper has employed the lucidly quantitative procedure to evaluate the pattern of changes of Tanzania trade flows in the two mentioned blocs.

II. LITERATURE REVIEW

A. Gravity Model and Switching Case

Tanzania switching decision from COMESA to EAC might be regarded as the consequences of the assessment based from gravity model. According to [25] as cited by [12], trade volume in bilateral countries may well be explained by their economic sizes and distance between them. The model hypothesizes that trade volume is directly proportional to the product of the economic sizes, in terms of GDP, but inversely proportional to the distance separating those countries. Mathematically, it is stated as

$$TV_{ij} = \frac{A * Y_i * Y_j}{D_{ij}}$$

where, TV_{ij} represents the value of trade between two countries involved in the trade (from i^{th} country to j^{th} country), A as the constant term, Y_i, Y_j are the economic sizes (GDPs) of the first (i^{th}) and second (j^{th}) countries and D_{ij} is the distance between the countries. However, the model affirms that the distance may not necessarily take the form of geographical location, rather may also carry the psychic ones such as language, historical perspectives, political affiliations and others alike.

Even though the model is highly appropriate for the bilateral trade relationship, it can still explain the involvement of one country to the entire regional bloc, considering the bloc acts as the single country. With this view, it will become logical to further the discussion to explore the basis of switching from one regional integration to another. For instance if one regional bloc, say X, is far located from one of the member states, say Z, this country Z might consider switching to nearby regional bloc, say Y, as the rational decision. As the reminder, this distance might either be geographical or psychic. Moreover, since the model emphasizes that the product of the countries' economic sizes increases the values of trade, and then country Z may also use this factor as another pillar to decide its decision. For instance, if regional bloc Y has higher GDP compared to bloc X, keeping all other factors constant, country Z will opt against the letter.

As synopsized before that the gravity model, like other discussed theories, was possibly the basis of Tanzania decision to switch from COMESA to EAC. However the decision under this model offers more challenging questions. For instance, considering the two blocs, COMESA has larger number of members, including all EACs apart Tanzania, which justify its superiority in economic size. This gage means that holding other factors constant, GDP of COMESA would be the sufficient convincing factor for Tanzania to keep hold with it, thus moving to EAC remain ambiguous. In terms of distance, geographically most countries of COMESA and EAC are clustered near to each other. However, when considering the psychic distance especially communication criteria, there are lots of language in COMESA due to large number of memberships than in EAC. This might justify the reason for Tanzania withdrawal from the former to co-form the latter. However, since all EAC countries apart from Tanzania are also members of COMESA, and the fact that some of other COMESA member states use the same language as Tanzanians, the psychic distance likewise possesses conflicting interpretation. This ambiguous as to whether the country made considerable assessments when deciding to switch from COMESA to EAC, is what lies the core of this study. The study looks at Tanzania trade performances in both blocs before and after the switching decision to evaluate whether the decree was potentially viable.

B. Empirical Studies on Gravity Model

As highlighted before, two important features of gravity model rationalize its usefulness in explaining flows of trade between partner countries; economic sizes and distance. The two have received significantly reinforcements from the vast number of empirical literature studies. For instance, when attempting to identifying the probably issues which influence bilateral trade flows in Uganda, [26] used the combination of tools such as absolute and relative differences (AD and RD) as well as generalized least square (GLS) to establish the findings of the study. Among other things, the study appeared to comprehend the gravity model hypothesis that sizes matter. It discovered that Uganda trade flows with countries having relative large GDP, such as Kenya, significantly outsized the flows with the relative small sized economies, such as

Tanzania. The study therefore concluded that GDP of both exporting and importing countries substantially matter in increasing potential to trade. Similar observation was made by [2] when investigating the trade flows in South Asian economies. The study concentrated in South Asian Association for Regional Cooperation (SAARC) which became Free Trade Area (FTA) in 2006. It employed gravity model to establish the flows of trade from one country to another with the integration. Like the previous findings, this study also disclosed that countries with higher GDP realize higher trade flows in SAARC than those with lower GDP. Meanwhile, using population as another proxy of economic size still the study established positive causal relationship with flows of trade. Comparable results were evidenced in Southern American in the study by [31] whose objective was to investigate the direction and magnitude of flows of trade in "MERCOSUR" region. With the use of two methods, panel fixed effects and pooled ordinary least square, the gravity model was augmented to include the impact of shared language, border and colonial system. In this case, the model was confined to capture the effects of both geographical distance, shared border, as well as psychic distance which were the common language and colonial ruler. The findings of this study were not as special as they indicated that GDPs for both bilateral trading countries have significantly positive effect to the flows of trade in the region. However, the study provided mixed results as regard to distance between the member states, especially by comparing geographical versus psychic ones. Literature further show that even with changing proxies of country's sizes, in most cases the findings remains unchanged. For instance in analogous study by [3] which attempted to investigate the impact of market size on economic growth in the World of trade liberalization for 60 selected developing countries. The study used OLS model at two scenarios; effect case under fixed period and cross sectional analysis. However, it employed the basic production function under neo-classical approach in OLS estimation, where three resources (human capital, physical capital and population) were identified as the main determinants of economic growth. The model also includes the degree of trade openness as the ratio of trade volume to GDP as another exogenous variable so as to interact the effect of market size and trade liberalization. With all these modeling practices, the study set four basically measures of market size; population, GDP, GDP per capital and GINI-coefficient.

The results indicated that except GINI-coefficient, all other proxies of market size had positive impact to the flows of trade in these investigated developing nations. The importance of economic sizes in explaining bilateral trade performance, as hypothesized by gravity model, has not been useful in developing countries alone, it has meanwhile proved crucial in the industrialized world. [24] when attempting to find out the factors which govern the flows of trade in Organization for Economic Co-operation and Development (OECD) countries. Using extended gravity model through incorporation of research and development (R&D) and foreign direct investment (FDI) in a constant term, the study found that not only the market size (that is GDP) but also the level of similarity in the level of FDI and R&D between the trading countries bear significant effect to the determination of the trade flows. These findings plus other depicted in the literature cited before demonstrate the strength of gravity model contemplation about the effect of market sizes in influencing trade flows in the bilateral trading system. They likewise uphold the rationale of this study to evaluate any existing trade potentials to Tanzania by switching from large sized integration to the lower one.

Alike sizes of the economies, several literature have attempted to describe the impact of distance, as indicated by the gravity model, to the flows of trade. In these studies, both geographical and psychic distances have been taken into account. Most of the proxies of distances were observed to akin with the model. However, there have been slight ambiguous on the role of common border in influencing the pattern and flow of trade in the cited literature. For instance, [27] attempted to find out the impact of bordering on the flow of trade for the 90% of the provinces and states of both US and Canada. With this study, the intention was to explore the effect of distance to the flow of trade using common border as the proxy of psychic distance. The study adopted [28] simple gravity model where among the traditional variables it also included dummy variable to furnish the trade flows between interstate at one side and province-state at the other. It was then revealed that there was significantly decreased in trade as the result of borders between countries. However this is highly explained by the nature of relationship between the countries under investigation and therefore existing barriers to trade enacted by such trading partners.

Again similar remarks that distance between the trading countries tends to impact negatively the performance of trade have been established in different literature (see [2], [26], [29]-[32]). In these studies, [26] and [29] used the geographical distance as the proxy of distance between countries, [2] made use of information and costs to export/import, [32] concerned with language whereas [31] applied the combination of geographical distance, common language, colonial history and border. Geographical distances as well as costs of information and to export/import were expressed to have been reducing trade flows while common language between the trading partners has been highly linked to the growth of economies through trade openness. Meanwhile, there was an ambiguity regarding the criteria of common bordering on its influence to the flows of trade. While the study in "MERCOSUR" showed that common language is not an influential factor in the determination of trade flows, other literature found it as the more stand-out cause and that it increases trade flow by 44%. Similarly, there was an indication of the clear relationship between the trade performance and history of past colonial system, that countries which passed under the same colonial master were showing higher level of trade flows. Generally, findings from literature provide several intuitions as to how to measure distance between the two trading partners and the corresponding causal effect to the trade flows. This project therefore anticipates that

if Tanzania had made considerable assessment on the pros and cons of switching from COMESA to EAC, using several proxies of distance as established by different studies, its trade flows would be showing an increasing trend since joining EAC bloc.

III. Model Estimation and Data

Model Estimation: This paper has employed bilateral trade flows between Tanzania and member of the two blocs; EAC and COMESA to estimate the impact of such flow across the two regional integrations. The crucial part of this analytical process was to understand which trade bloc exhibit higher trade flow with Tanzania. Bearing in mind that COMESA is larger in size compared to its counterpart EAC, this understanding on the superiority of flow of trade with either bloc over the other would be imperative to substantiate the role of regional size on the performance of trade. However, in order to have a clear distinction of the memberships, all nineteen trade partner countries used in this paper have been assigned in only one region among the two employed in the analysis. This meant that the four countries of EAC (Kenya, Uganda, Rwanda and Burundi) which are also members of COMESA were regarded as being only in EAC; since Tanzania is no longer the member of COMESA, and that its trade flows with the four countries were then regarded to be only influenced by EAC relationship. This also made easy to trace the trade flows between Tanzania and EAC countries on one side and COMESA on the other.

To perform the analysis, the paper employed gravity model to estimate the causality relationship between numbers of variables. As used earlier by [25] the gravity model specifies that the flows (imports and exports) of bilateral trade are ideally explained by the economic sizes, in terms of GDP per capita of the trading partners and all other forms of barriers to trade. The model specifically identifies physical distance between the trading countries to be the major bottleneck to flow of trade; and again recognizes the importance of internalize other factors which might influence flows of trade in the analysis. Most literature (see [2], [26], [29], [31]) use dummy variables in the internalization process. Meanwhile empirical studies (see [18], [20], [32]) have described factors such as language used by the trading partners, neighborhood, the currency exchange rate, whether the countries are landlocked or island and the history of colonialization to be more prominent in depicting the power of dummy variable. This paper however did not include variable language because Tanzania, as the reference country, uses different language from all other countries; making the variable irrelevant in the analysis. Since this study intends to evaluate the influence of regionalism on trade flows, the dummy for regional bloc (bloc) at which the Tanzania trade partner countries belong are also added to the model. The augmented gravity model is then re-arranged as:

$$ln(T_{ij})_t = \beta_0 + \beta_1 ln(Y_i)_t + \beta_2 ln(Y_j)_t + \beta_3 ln(D_{ij}) + \beta_4 (Bord_{ij})$$
$$+ \beta_5 (Lock_{ij}) + \beta_6 (Isla_{ij}) + \beta_7 (Colo_{ij}) + \beta_8 (OER_{ij})$$
$$+ \beta_9 (BLOC_j) + \epsilon_{ijt}$$

where T_{ijt} is the trade volume of Tanzania (country i) relative to other country j at time t. Y_{it} and Y_{jt} are the GDP per capita of Tanzania and other country j respectively at time t. D_{ij} are the physical distance from major business city of Tanzania (Dar es Salaam) to the capital cities of other countries j in the analysis. OER_{ij} is the official exchange rate between Tanzania and its partners. $Lang_{ij}$, $Bord_{ij}$, $Lock_{ij}$, $Isla_{ij}$, $Colo_{ij}$ are dummies for language, whether countries are bordered to each other, landlocked, island and colonization history respectively. Meanwhile, the definitions of dummy variables are as;

TABLE I
DEFINITION OF THE DUMMY VARIABLES

1	*for the similar colonial ruler*
	for bordered countries
	for at least one of the paired countries is landlocked
	for at leats one of the paired countries is island
	for Tanzania EAC trade partner country
0	*otherwise*

Additionally, in order to collect any notable violation of OLS method appropriate tests have been used to mitigate the desecrations and fitting procedures were used in correction. At large extent, econometric view (E-View) computer software was used in the analysis.

Data: Considering the nature of the study, largely secondary data (from 2000 to 2013) were used in this research project. Crucial data relating to the volume of trade were collected from International Monetary Fund electronic library database (IMF e-library). On other hand, nominal exchange rate per USD as well as GDP per capita estimated using purchasing power parity (PPP) per current international dollar for the study countries were collected from the website of World Development Indicators (WDI). Since exchange rates were collected in relation to USD, cross rate analysis was employed to establish the exchange rate between the two countries. Cross-rate analysis to obtain official exchange rate (OER) was therefore computed as;

$$= \frac{Tanzania \ (country \ i) \ nominal \ exchange \ rate \ per \ USD}{Country \ j \ nominal \ exchanre \ rate \ per \ USD}$$

This meant that, OER in this paper has been used as Tanzania currency per unit of trade partner's currencies. Distances between Tanzania's major business city (Dar es Salaam) to the capital cities of all other countries in EAC and COMESA were estimated from the website of distance calculator. Information regarding official language used by countries in the analysis, whether they are landlocked, island and have bordered with Tanzania or otherwise were collected from Research and Expertise on the World Economy (CEPII).

IV. Empirical results

Since both heteroskedasticity and autocorrelation tend to affect the decision on the relevance of the employed independent variables in explaining the dependent variable, Breusch-Pagan and Durbin-Watson tests were used to investigate the presence of the two cases respectively. The

two, as they existed in the first place, were then corrected using White Standard Errors and Covariance and Cochrane-Orcutt procedures respectively. Meanwhile, there were sufficient degree of multicollinearity between official exchange rate and distance between capital cities, which would impact the sensitivity of the model estimates. Since exclusion of distance in the model would lead to lower adjusted-R^2 than official exchange rate, the latter was then omitted in favor of the former, as shown in Table II.

TABLE II
REGRESSION RESULTS

Variable(s)	Coefficients	t-statistic
Constant	-3.863033**	-9.391685
LnPer_Capita GDP1	4.291220**	10.13519
LnPer_Capita GDP2	-1.838700	-6.732205
LnDistance	-2.275805**	-6.240271
Landlock	-0.338088	-1.099902
Island	-0.878718**	-3.436554
Border	2.102087**	5.992626
Colon	3.552074**	9.799438
Bloc	2.578236**	4.818363

Note: ** implies statistically significance at 5%, and $R^2 = 0.835663$

The findings show that while the constant, economic size of the country of reference (Tanzania), distance between the capital cities of the trade partners, islanding status of the countries, bordering position, history of colonialization and bloc are significant at 5%, the other variables such as economic size and land-locking status of the partner countries are not relevant factors in explaining the flows of trade in this context. Considering the composition of exports and imports of the countries in these two blocs, where mostly are primary commodities such as cereals, mineral fuels, paper, soap and others which signal less point of industrialization in the regions, the sizes of the partner countries become marginally significant as there is no pattern of trade flow diversification. Again, since most of the African countries, Tanzania being not exception, are less dependent in marine transportation system rather on road network, location of the countries (as to whether is land-locked or not) remains unimportant to influence the flows of trade. This is probably why at 5%, the findings indicated that the variable "landlock" was insignificant.

From the results, while the coefficient of the constant provides meaningless economic interpretation since neither country can experience negative trade volume, it still remains crucial for statistical estimations. Meanwhile, the findings show that one percent increase in per capita GDP (economic size) of the reference country lead to the increase of about 4.3% of trade volume, and one percent increase in distance between the capital cities of the trading partners lead to the decline of about 2.28% of the trade volume. Moreover, the study found out that when at least one of the trade partner countries is an island state the trade volume decline by nearly 88%. Likewise as the case of land-locking, low level of development which hinders an effective utilization of marine transport system explains such massive drop of trade volume

in the presence of island nation. Furthermore, there were positive causality effect for the variables border and history of colonialization on trade volume; meaning that if the two trading countries are bordered to each other, and that they were ruled by similar colonial nation the trade volume tend to increase by 210% and 355% respectively. These are the typical gravity model postulations, as justified by several literatures in vast number of studies elsewhere.

In explaining the significance of the regional bloc, the results show that over the period of study (2000-2013), Tanzania acknowledged more than 257% of trade volume in EAC than in COMESA. This evidences that over the period of thirteen years, the country has been able to integrate significant to the new regional bloc. However this would have sufficiently been justified by the trend before the switching phenomenon. The main point in this case is such that country may witness higher trade volume even by engaging in lower sized regional bloc. This entails that despite the fact that economic sizes of the trading partners have been summed up as the important factors to gauge the magnitude of trade, still there are more economic circumstances where the hypothesis might not materialize. In regionalism, this great applies when comparing technical structure and degree of integration between the blocs under consideration. For instance, while COMESA is larger in size and older than EAC, its functionality looks as if it is still a FTA. The region has not given high emphasizes on some of the areas, such as free movement of labor, which reflect the status of common market. This makes it different from the pace at which EAC takes. In fourteen years since its commencement, EAC has been witnessed to move from FTA to common market, with negotiation for higher degree of integration being in place. It is therefore less costs to undertake trade engagement in EAC than COMESA; thus asserting why size of the region sometimes become insignificant in influencing the flow of trade.

V. CONCLUSIONS AND POLICY IMPLICATIONS

Since debate about the effect of the size of the trading partners on their trade flows has been critical following the evolution of gravity model, this paper attempted to investigate whether such influence of the size may apply to the regional blocs. With Tanzania, which withdrew its membership in COMESA to co-form EAC, as the case of reference, the paper realized that the size of regional bloc is not necessarily the factor to boost trade flows. Despite leaving larger regional bloc (COMESA) to form smaller one (EAC), Tanzania trade flows with the latter were observed to be higher than the former. As opposed to gravity model proposition that landlocked countries impact negatively the flows of trade, there were insufficient evidence to justify this in the trade data involving Tanzania and the analyzed countries. Again, apart from economic sizes of the Tanzania trade partner countries, all other variable as laid down by gravity model were significant. These findings however pose further argument as to what had happen if the reference country (Tanzania) would have not been withdrawn from COMESA. Tanzania is

bordered with four other members of COMESA; meaning that distance and bordering status remain favorable conditions for trade flows. Withdrawing from COMESA might have caused the country to substantially lose the potential of these four markets. Therefore while it is now enjoying the increase of trade flows by allying with EAC countries, it is also paramount to investigate what would have been the case if the country had opted to engage in multiple membership.

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