

Bilateral Trade, Real Exchange Rate and Economic Growth Nexus in African Countries.

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ABSTRACT :: The study investigated “Bilateral Trade, Real Exchange Rate and Economic Growth Nexus in African Countries: Evidence from Nigeria’s border closure” using the Poisson Pseudo-Maximum-Likelihood (PPML) of gravity model over the period of 2000 to 2020. Our findings on the exporter GDP, shows a positive relationship with the bilateral trade flows represented by export at a statistically significant level. Thus, explaining trade flows among the countries is a positive function of the importer GDP. The Real Effective Exchange Rate (REER) also has a positive relationship with bilateral trade flows among the countries. Sharing a common border, one of the independent variables of this study, however, has a negative relationship with bilateral trade flows. This implies that sharing a common border with other countries is not a major determinant of trade relations with other countries. This result does not follow our a-priori, which expects border sharing to have a positive impact on trade flows.

KEYWORDS: *Bilateral Trade, Border sharing, Real Exchange Rate, Poisson Pseudo-Maximum-Likelihood (PPML)*

I. INTRODUCTION

There has been widespread and global discussion on the impact of standards and technical regulations on trade. This stresses the need for developing countries to deepen internal trade and increase export markets. In the present, trade restrictions through technical barriers, tariffs, quotas, and export restraint agreements have become more popular. In addition, there has also been a longstanding debate on free trade and protectionism and how policies can stimulate the macro economy. This traces back to Adam Smith with the notion that, in the absence of externalities or market distortions, free and competitive markets do best in the allocation of their resources to their most productive uses. But the reality is that the world is full of market imperfections and restrictions and tariffs do not suit to addressing these imperfections and most at times worsen the matter by uplifting the deflection of trade to smuggling and invasion or inefficient producers. A lot of trade barrier literature focuses on individual industries because market imperfections are at their core [1]. Using tariffs for macroeconomic purposes has shown futility and destructiveness by the Great Depression and the consensus is that macro objectives are more easily attainable through macro tools such as monetary and fiscal policy.

Trade restrictions can serve economic and at times political intents, but they can also enact substantial costs. Restrictions protect domestic companies and workers from foreign competition by raising the prices of imported goods. Arguments raised in this respect that restrictions on trade should be seen as a tax on domestic consumers. The cost of protecting vulnerable companies’ workers exceed the potential cost of finding new jobs for those workers according to experts. It criticized that trade restrictions dissuade the companies being protected from making the changes needed to challenge foreign competition. Companies are likely to have less incentive to improve their effectiveness and organization once they receive government support in the form of restrictions and subsidies, they eventually become dependent on the government for survival.

Trade brings about employment gains where production is most effective, though might result in unemployment in sectors where there is inefficiency in production. Trade leads to higher productivity, income and output throughout the economy. Increase in tariffs are followed by decreases of productivity and output as well as rises in unemployment and inequality. Tariffs are argued to increase GDP and/or employment by improving the trade balance. There isn’t much effect on the trade balance, even with literature that increase in tariffs are followed by appreciations in real exchange rate which might negate any direct impact of protection on the trade balance.

Tariff increases lead to higher prices and diversion of resources away from relatively efficient economic activities towards less efficient economic activities. In addition to tariffs, it was worth noting that other policy measures can create barriers to trade that have effects like tariffs. Consumers because of such measures pay more for goods than they would have, businesses face higher costs than they would have, and output and employment, on the net, fall. Tariffs could lead to lower incomes for owners of capital as well as workers. Higher consumer prices similarly would reduce the after-tax value of labour and capital income due to tariffs.

The big question is, what does the macroeconomy look like in the aftermath of trade restrictions? The consequences of trade policy have embraced a variety of research methods to evaluate the effects of these policies on outcomes of interest to economists and policymakers. Concerning the identified issues linked with trade restrictions, the World Bank motions three propositions that the G20 countries could adopt. These leading countries could: “Commit to greater transparency by agreeing to provide quarterly reports on new trade restrictions and industrial and agricultural subsidies to the WTO; Advocate greater Aid for Trade for low-income countries; and seize the opportunity to support global trade in a time when it desperately needs to be supported (World Bank, 2009).

Nigeria, possessing one of the largest oil and gas reserves in the world has about thirty-seven solid minerals and a population of over 170 million people (World Bank). When compared to emerging Asian countries, its economic achievement is rather a failure. One of the major aims of trade is to encourage economic growth but recently, the Nigerian economy has been unstable as a result of unstable prices, adverse balance of payment and unemployment, etc. one of the major problems why the benefits of international trade cannot be seen to have a positive impact on growth is the variations in the macroeconomic policy coming from the trade which turned the country into the import-dependent economy. There has not been a contribution of international trade to growth because imported goods damage the local industries by making their goods look inferior thereby resulting in negligence, leading to a fall in the growth rate of output of the local industries, which later affects the aggregate economy. Therefore, this study seeks to determine the nexus between bilateral trade real exchange rate and economic growth in Africa, with evidence from the Nigerian border closure.

The land border closure by the Nigerian government has generated public debates from various quarters of the country. The land border happens to be one of the country’s main channels for international trade across the region and the African Continent. With Nigeria being a major stakeholder in ECOWAS and a strategic nation for the success of the African Continental Trade Agreement (AFCFTA). The achievement of the AFCFTA objectives necessitates the opening up of the economy to aid the free flow of trade and movement of people. Specific Limitations on Trade, Customs and Administrative Entry Procedure, Standards, and Border closure represent some of the various measures of Non-Tariff Barriers (NTBs).

Non-Tariff Barriers are a subset of Non-Tariff Measures and are defined by the OEDC (1997) as those measures, other than tariffs that some countries apply selectively in order to restrict imports. There exists a wide range of Non-Tariff Measures, aimed toward control of export volume, regulation of import prices, production, and health and technical standards. NTMs are much more complex and difficult to recognize and measure. The implementation of NTM varies across countries from legitimate protection measures to restrictive measures and each NTM may lead to different empirical results. Border closure is part of Non-Tariff Measures (NTM) of trade restrictions. Most empirical studies dwell on the impact of NTM as a means of trade restriction on international trade, while others focus on the welfare effect.

1.1 Justification and Contribution

National governments have introduced compulsory regulations at the border, yielding severe distortions in commercial markets. Measures such as domestic regulatory systems to restrain trade and limit market entry through environmental, health, or safety mandates are not based on international norms. These requirements may also be discriminatory within the context of World Trade Organisation (WTO) disciplines, including commitments undertaken by WTO members in the Agreement on Technical Barriers to Trade (TBT) or the Agreement on the Application of Sanitary and Phytosanitary Standards (SPS). There are however relatively few studies about how these barriers affect trade, especially in Nigeria and Sub-Saharan Africa. There have also been accelerated requests by the industry to focus on the costs of regulatory barriers to trade over the past decade. For example, the Transatlantic Business Dialogue (TADB) and much of the work in the Asia Pacific Economic Cooperation (APEC) talks has been focused on finding ways to reduce technical barriers.

The study intends to investigate the relationship that border sharing has on bilateral trade, evaluate the role of a country’s income in international trade and discuss policy justifications.

II. LITERATURE REVIEW

2.1 THEORETICAL REVIEW

The theories of trade provide answers to why nations trade what they do. The theories of trade can be seen from different schools of thought, which are the Classical country-based theories and the modern firm-based theories.

2.1.1 Classical country-based theories

These refer to Mercantilism, Absolute Advantage, Comparative Advantage, and Heckscher-Ohlin theories. Mercantilism is the first theory propagated in the sixteenth and seventeenth centuries and has been one of the most debated theories to date. According to mercantilists, a country is rich by the holdings of its precious stones. The theory of Mercantilism proposes that countries should export more than they import suggesting that government, through protectionism policies should encourage export and discourage import. Many economists for being unfair and a zero-sum game, only one party (country) benefits have criticized mercantilism while the other is at a loss. It is believed that mercantilist policy is being adopted by some countries in the modern business world today.

Adam Smith proposed the next classical theory known as the Absolute Advantage, which explains the benefits of free trade and emphasizes that in order to raise richness is to embrace free trade between states. Adam Smith examined the theory of mercantilism in his book, *An Inquiry into the Nature and Causes of the Wealth of Nations*. He defies the zero-sum game arguing that only the mercantilist country benefits and gives no positive advantage to the consumer. He was of the opinion of a positive-sum game where it is more profitable for export transactions if a country imports goods that will also be beneficial to others, consumers inclusive. Under mercantilism, it was not likely for countries to become rich concurrently and the wealth of the nations is independent of gold reserves but dependent on goods and services available. Smith argued that a country has an absolute advantage in the production of goods when it is more efficient than another country in producing it.

David Ricardo in 1817 refined the theory of Adam Smith and suggested the Comparative Advantage theory where he inferred those countries could benefit from trade even if one of them is less productive [2]. According to Ricardo, "a nation, like a person, gains from the trade by exporting the goods or services in which it has its greatest comparative advantage in productivity and importing those in which it has the least comparative advantage. The comparative advantage theory doesn't state that prices are invariant, there are not any economies of scale, and it assumes no tariffs or distinct trade barriers.

[3] and [4] came up with the Heckscher-Ohlin theory in the 1920s and 1930s as an extension of the Absolute and Comparative Advantage. They believe that comparative advantage rises from dissimilarities in national factor endowments, that is, the more profuse a factor, the lesser the cost. They expect that countries will export goods that make intensive use of locally abundant factors and import goods that make intensive use of factors that are locally scarce. The three theories suggest if local citizens buy goods from other countries, the economic growth of the country will improve if the goods are produced locally.

2.1.2 Modern Firm-based Theories

The modern firm-based theories began after the Second World War developing with the growth of the multinational company and it contradicts the classical country-based theories. The development of multinational companies or Intra-industry trade wasn't addressed properly by the country-based theories. The modern firm-based theories integrate other products, technology as well as quality into the understanding of trade flows.

The product life cycle theory was developed in the 1960s by a Harvard Business School professor, Raymond Vernon. The theory instigated by the marketing field, stated that a product life cycle has three stages: new, maturing, and standardized product. It assumes that new product production will take place entirely in the country of innovation. This theory was useful in the 1960s in explaining manufacturing success in the United States. The theory has been less able to describe current trade patterns where innovation and manufacturing happen around the world.

[5], a Swedish economist, 1961 developed the country similarity theory where he explained the Intra-industry trade. His theory suggests that consumers in nations that are in the same or akin stage of development would have similar preferences and companies produce for domestic consumption first. Trade, where brand names and product reputations are important in the decision-making of buyers, is where this theory is often useful.

2.2 Empirical Review

There has been widespread public debates on how restricting trade affects economies. Most regions advocate free trade area (FTA), the achievement of which is dependent on opening up of the economy to aid the free flow of trade and movement of people. The land border happens to be one of the main channels for trade, particularly regional and international trade. However, Specific Limitations on Trade, Customs and Administrative Entry Procedures, Standards, and Border closure represent some of the various measures of Non-Tariff Barriers (NTBs) that can act as limitations to trade.

Several efforts have been made to empirically analyze the impact of trade restrictions on the economy and the results from these studies have been mixed. The existing literature however does not show clear evidence of the impact of trade restrictions on macroeconomic variables. Many studies show evidence that trade restriction has a positive impact on Gross Domestic Product (GDP). Other studies on the other hand report that it is difficult to find a clearly distinct positive impact or even that there is a negative impact between trade and GDP.

The Study of the Macroeconomic Consequences of Tariffs by [6], suggests that tariff increases have an adverse effect on output, and productivity and also increase unemployment and inequality coupled with the burden of

tariffs. The impact on the trade balance is however small due to the induced offset in exchange rate appreciation. Analysis of the BREXIT by [7] further supports the argument that Tariffs' elimination increases the entry of more imported goods from regions, which are competitive in those sectors, thus increasing competition in the domestic market, this assertion is buttressed by the theory of comparative advantage. On the other hand, the emergence of barriers to trade (MFN tariffs and NTBs) would mainly affect the exports of the manufacturing industry. Consequently, production in several industries will fall.

[8] investigated the general impact of Trade Restrictions in European and Sub-Saharan Regions and their findings revealed the existence of a tradeoff between globalization and trade restriction. The EU region being one of the largest trading zones and economies adjudged as a developed region is more prone to this effect compared to the SSA region. The members of the EU have relatively smaller gains because they continue to conduct the bulk of their trade amongst each other at existing levels of NTM-related trade costs (OECD 2019)

The finding by [8] is countered by [9] whose study of trade restrictions in the United States (USA) targeted at reducing trade volume and income levels led to a deterioration in trade balance across the world with the exception of the US. They also modeled the trade war between the US and the rest of the world. Findings indicated that export and import activities regressed across the world, the strongest being in the short run, while it lingered on in the US. The impact was however more pronounced on the GDP of the rest of the world. [10], who studied the Impact of Non-Tariff Measures on Trade in Mauritius, showed trade restricting effects of NTMs are most costly for small countries such as Mauritius. These effects are transferred to the consumers and users of inputs and further cause inefficient allocation of resources. [11] emphasized the importance of minimizing NTB in the EEU (Russia, Belarus, and Kazakhstan). Allowing free trade improves the welfare of the country as well as the GDP. They found that Reducing NTB stimulates exports and domestic production, promotes healthy completion, increases income and purchasing power, and allows efficient allocation of resources.

[12] investigated the cost of tariff and Non-tariff protection in Columbia across sixteen (16) sectors of the country. In their opinion, Tariff and non-tariff protection have significant costs for society. Allocating resources to non-efficient uses lessens the society's prospect for wealth generation, thus affecting the welfare of citizens, and on the other hand, favoring the interest of a particular group who benefit from the protection. Indications from simulations carried out show protection can cost up to 1.5% of GDP, costing the poorest household up to 3.6% of their income, judging from the effects of "allocative efficiency" and the unrecoverable efficiency losses associated with the power of the protected sector's market. However, some protections have an advantage and the justification arose from information symmetry in markets, negative externalities, and incomplete markets. Incorporating these advantages into further simulations and allowing for minimal tariff and non-tariff protection to comparable levels observed in countries in the region together with favorable policies, especially in the agricultural sector showed additional 3% GDP growth, with welfare gains equivalent to 6% of the income of the poorest households. This finding is consistent with that of [13] for African countries, which revealed large dispersion in welfare gains across countries.

Welfare gains from an imperfectly competitive market are lower for most countries, but due to scale effects, larger economies like Nigeria and South Africa gain more from NTB reduction. For a perfectly competitive market, welfare effects from tariff elimination alone are very small but larger than the effects of a reduction in NTBs. The increase in welfare from combined tariff elimination and NTB reduction is 2.1 percent for the continent (2.6 percent for SSA). The impact in welfare gain is reflected through consumption and output in addition to improved efficiency. The study also showed that the largest welfare gains accrue to open economies that engage in Intra-regional trade such that the economy is opened to larger market opportunities and like trade theory envisages, small countries benefit more from favorable terms of trade resulting from less trade restriction. This finding also relates to the African continent as a whole.

Considering the sectors, manufacturing and agriculture are key drivers of income changes for most countries. Over 60 percent of the increase in overall income comes from higher manufacturing output, while the agricultural sector contributes about 16 percent to the overall increase in income. The other sectors, which are primarily non-traded, though expand, make a much smaller contribution to potential welfare changes. Incorporating intermediate goods and input-output linkages. Consistent with findings in the literature suggest welfare gains will be higher since lower trade restrictions (tariff elimination and NTB reduction) allow the import of intermediate goods thereby increasing production at lower cost and higher margins. [14] [13].

[15] investigation of the impact of removing industrial tariffs under the European-Vietnam free trade agreement, revealed a reduction of tariffs will improve social welfare and strengthen the economy in terms of increased household consumption, production, and trade. While also having consequences arising from competition from imports leading to the budget deficit. [16] adopted the panel data methods, fixed effects Poisson Pseudo Maximum Likelihood (PPML) estimator, and findings revealed that on many occasions, both sanitary and phytosanitary (SPS) and Technical Barriers to Trade (TBT) measures restrict and promote trade. The further comparison suggests that TBT measures are more restrictive than SPS measures and thus when a low-income country imposes a TBT, other low-income countries appear to be the most affected. Overall, most studies including those cited above indicate that NTB is bad for welfare and gains arise only if other policies are

implemented along with the imposition of NTB in situations where there exists negative externalities and NTB are deemed relevant [12] [15] [16].

Smaller countries/Economies are more affected when trade restrictions are put in place. In addition, the majority of policy adjustments take place in agriculture and manufacturing areas, and income gains are widely spread, including in the services sector. Low income and poorer households suffer more due to a reduction in income, trade, and agriculture [9] [12] [15].

[17] review and meta-analysis of empirical evidence using the Multinomial Logit (MNL) model, Probit, and Tobit model for studies on effects of non-tariff measures on agri-food trade showed that observed impacts of NTMs differ across categories of NTMs, a proxy for NTMs, and intensities of details of studies and the methodologies adopted in the study. Some studies were analyzed using the Computational General Equilibrium (CGE) model, [12] [15] [18] [19]. Others adopted the Gravity Model [10]

[19] [6] analysis of the Macroeconomic Consequences of Tariff was based on Impulse Response Function conducted for 151 countries. Other Models adopted were GVAR model [9], Augmented Philip Curve framework [7] and the GTAP Model [18].

III. METHODOLOGY

The gravity model depicts the relationship of bilateral trade flows with the GDP of the countries of interest and with their geographical distance. The market size is reflected by the GDP in both countries and measures the economic mass and also the potential demand for bilateral import in the importing country, while GDP in the exporting country embodies the potential supply and diversity of goods from that country; geographic distance reflects resistance to bilateral trade. Usually, the gravity equation is expressed in logarithmic form. One of the empirical approach is to extend the study by [20], which was a simple gravity model of trade. In the standard gravity approach, bilateral trade between countries, either at the aggregate level or at the industry level, is regressed on the GNP levels of both countries, their populations, and geographical distance between them. To control for scale effect and resistance factors [21]. proposed the addition of joint membership in Regional Trade Agreements and other basic trade determinants. We follow the literatures and further extend it by incorporating other variables such as population, common colony (dummy), real effective exchange rate, common language (dummy). Our aim is to incorporate trade activities in a number of developing countries, particularly countries directly affected by the border closure imposed by the Nigerian government. Thus, a useful form of the gravity equation is:

$$\begin{aligned} \ln(M_{ij k}) = & b_0 + b_1 \ln(GDP_i) + b_2 \ln(POP_i) + b_3 \ln(GDP_j) + b_4 \ln(POP_j) \\ & + b_5 \ln(DIST_{ij}) + b_6 RTA_{ij} + b_7 (CC_{ij}) + b_8 TGDP_{ij} + b_9 REER \\ & + b_{11} CL + \epsilon_{ij} \end{aligned}$$

i and j refer to exporting country and importing country, respectively, k indicates sector of activity. RTA denotes a dummy for bilateral membership in a regional trade agreement and is taken here as a prototype variable for trade-expansion factors.

The gravity model would be estimated using the Pseudo Poisson Maximum Likelihood (PPML) technique. The paper used the Poisson Pseudo Maximum Likelihood (PPML) method to deal with the zero-valued trade flow and the logarithm transformation this is consistent with Santos Silva and Tenreyro [22] [23] justification. According to them, in the presence of zero-valued observations and also due to the logarithm transformation of the gravity equation, OLS (both truncated and censored OLS) are inconsistent and have a very large bias which does not vanish as the sample size increases which confirms that they are inconsistent [22] [23] and [23]. However, the PPML estimates the gravity equation in levels instead of taking its logarithms and this is said to avoid the problem posed by using OLS under logarithm transformation. According to them, this model is appropriate: first, the Poisson model takes account of the observed heterogeneity. Secondly, the fixed effects PPML estimation technique gives a natural way to deal with zero trade flows because of its multiplicative form. Third, the method also avoids the under-prediction of large trade volumes and flows by generating estimates of trade flows, and not the log-linearized, to be the best performing estimator that naturally deals with zero trade flows, consistent and gives the lowest bias among the other estimators. They, therefore, suggest it as the new workhorse for the estimation of the typical constant elasticity models, such as the gravity model.

The PPML estimates β by solving the following first order conditions

$$\sum_{i=1}^n [y_{ijt} - \exp(X_{ijt} \beta)] X_{ijt} = 0 \quad (1)$$

Equation 2 is the PPML estimator, which is consistent under the estimator's equidispersion assumption that the conditional mean $E[y_{ijt} | X]$ given as $\exp(X_{ijt} \beta)$ is equal to the conditional variance $V[y_{ijt} | X]$.

$$E[y_{ijt} | X] = \exp(y_{ijt} \beta) \propto V[y_{ijt} | X] \quad (2)$$

However, the equidispersion assumption is unlikely to hold [22] as the estimator does not fully take account of the presence of unobserved heterogeneity caused by the unobserved trade costs, thus making the conditional

variance to be greater than the conditional mean. Thus, inferences are based on the Ericker-white robust covariance matrix estimator [24] [25].

3.1 Data and Sources

The data used for estimation were obtained from World Development Indicators (WDI) and International Financial Statistics of the International Monetary Fund (IMF). The data on exports were used to proxy the bilateral trade flows among the countries under investigation. The data was obtained from the IMF Direction of Trade Statistics (DOT). Data on GDP, Real Effective Exchange Rate (REER), and Trade-to-GDP were extracted from the World Bank World Development Indicators (WDI) database. While data for the other variables such as the population values, border (dummy), distance (dummy), colony, Regional Trade Agreement membership (RTA), and language (dummy) were extracted from the CEPII database. The sample covers annual data from 2000 to 2020. The countries considered were the neighboring countries sharing a common border with Nigeria such as Ghana, Benin, Niger, Togo, and Cameroon, and the respective trade flows originating from one country to the other. A complete set of Variables considered for the analysis is presented in the table below.

TABLE 1. Variables considered in the analysis

Variables	Definition	Source	Expected Sign
Exports	Exports in millions of Dollars (dependent variable)	DOT	
<u>ExpGDP</u>	Natural logarithm of GDP in current US dollars of a reporter country	WDI	+
<u>ImGDP</u>	Natural logarithm of GDP in current US dollars of a partner country	WDI	+
REER	The Real Effective Exchange Rate of the countries' currency in terms of Dollar	WDI	
Trade-GDP	The value of trade to GDP	WDI	
Distance	Natural logarithm of geographical distance between the capital of the trading partners	CEPII	+
Population	The geographic population of the country	CEPII	+
RTA	Dummy variable standing representing the presence of regional trade agreements between the countries	CEPII	+
Border	Dummy representing countries sharing a common border	CEPII	+

Source: Authors compilation.

IV. ESTIMATION RESULT

Table 2 presents the estimated result of the PPML gravity model of selected ECOWAS countries sharing a common border with Nigeria. The results include the parameter estimates, robust standard errors, p-values for significance tests, and the confidence interval. Among the variables for estimation, some variables such as RTA, Distance, and Colony, were dropped due to the problem of collinearity in the estimation processes.

TABLE2. Estimated Results.

<i>Number of parameters: 7</i>						
<i>Number of observations: 420</i>						
<i>Pseudo log-likelihood: -60145.396</i>						
<i>R-squared: .2981450</i>						
<i>Option strict is: off</i>						
		Robust				
<i>bilat</i>	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
<i>lnexp</i>	0.0199	0.0346	0.57	0.5660	-.0479532	.0877155
<i>lnimp</i>	0.0445	0.0225	2.02	0.0390	-.0034224	.0924403
<i>reer</i>	0.0118	0.0061	1.94	0.0530	-.000131	.0236512
<i>lnexp</i>	1.3053	0.1499	8.71	0.0000	1.011521	1.599142
<i>border</i>	-0.2447	0.4466	-0.55	0.5840	-1.119998	.6305951
<i>tradg</i>	0.0329	0.0075	4.41	0.0000	.0183147	.0475586

_cons	-22.2716	3.7765	-5.90	0.0000	-44.5432	
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Source: Authors calculation, Stata (2015).

The exporter GDP shows a positive relationship with the bilateral trade flows represented by export. However, given the p-value of 0.56, the result is statistically insignificant at the 0.05 level of significance. This implies that the GDP of the exporting country (Inexpg) does not explain the bilateral trade of exporting countries. For the importing country, GDP has a positive relationship with the bilateral trade and is statistically significant at a 0.05 level of significance. Thus explaining trade flows among the countries is a positive function of the importer GDP. This further implies that higher income in the importing country leads to increased trade flows with other countries. This follows that an importing country with more income will want to trade more. The Real Effective Exchange Rate (REER) has a positive relationship with bilateral trade flows among the countries though only significant at a 0.10 level of significance. This means that a depreciation in the value of the country's currency will lead to increased bilateral trade flows. This is because depreciation of a source country's currency will cause its goods to become cheaper thereby encouraging exports.

Population and Trade-to-GDP both have a positive relationship with bilateral trade flows and are highly statistically significant at 0.05, 0.01, and 0.10 levels of significance. This follows that the higher the population and trade-to-GDP, the better the trade among countries. The result agrees with the findings of Phat and Hanh (2019) who investigated the impact of removing industrial tariffs under the European–Vietnam free trade agreement analysis. The increased population could therefore be said to foster improved trade relationships between countries, likewise trade/GDP. Sharing a common border from the analysis carried out, however, has a negative relationship with bilateral trade flows. This implies that sharing a common border does not improve trade with other countries. This result is however not statistically significant. This result does not follow our a priori that expects border sharing to have a positive impact on trade flows.

The result buttresses the fact most of the African countries produce similar products, they are rarely self-sufficient in their local production and the imports are mainly from developed countries. Thus, this result does not conform to expectations. Findings, therefore, indicated that the determinants of the bilateral trade flow among Nigeria, Ghana, Togo, Benin, Cameroon, and Niger are Population, Importer GDP, exchange rate, and trade to GDP. This result did not agree with [15] findings, which revealed that, both sanitary, and phytosanitary (SPS) and Technical Barriers to Trade (TBT) measures to restrict and promote trade.

V. CONCLUSION AND POLICY RECOMMENDATION

This study investigated the impact of trade restrictions on the Nigeria economy with evidence from the border closure. Using the Poisson pseudo-maximum-likelihood (PPML) estimation technique of the augmented gravity model, we estimated panel data of export flows from Nigeria, Ghana, Togo, Benin, Niger, and Cameroon being the major countries sharing common border with Nigeria for the period 2000 to 2020.

Our result reveals a negative and statistically insignificant relationship between border sharing and bilateral trade flow, thus sharing a common border does not induce bilateral trade, therefore, border closure is not a major factor for trade flows in the region. However, importer GDP, trade/GDP, Population, and REER have positive and statistically significant relationship with bilateral trade flows. Hence, we conclude that trade flows could increase due to the high population, growing GDP, and appreciation in real effective exchange rate in the region.

This implies that an increase in any or all of these variables fosters trade of one country with the other.

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